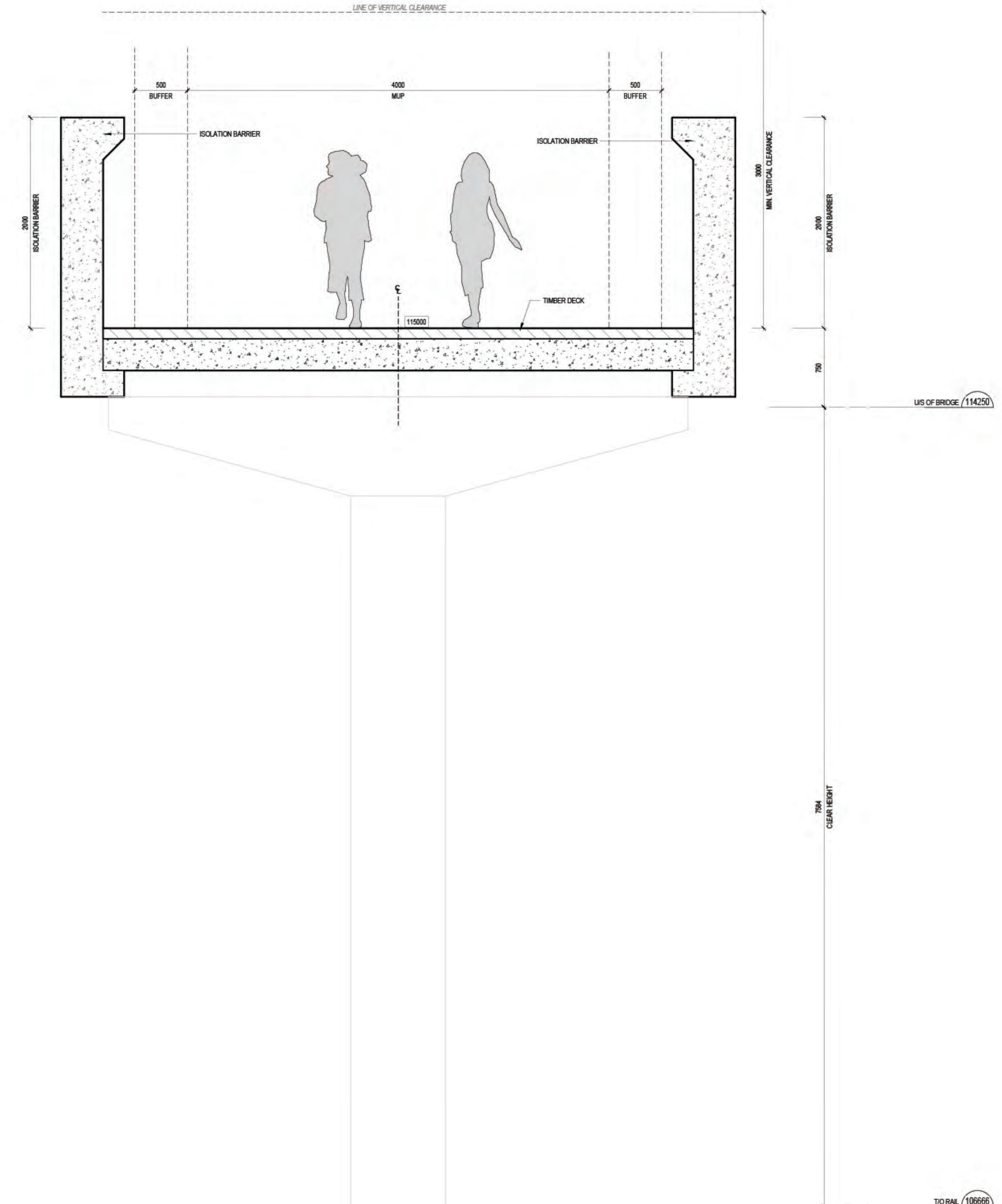
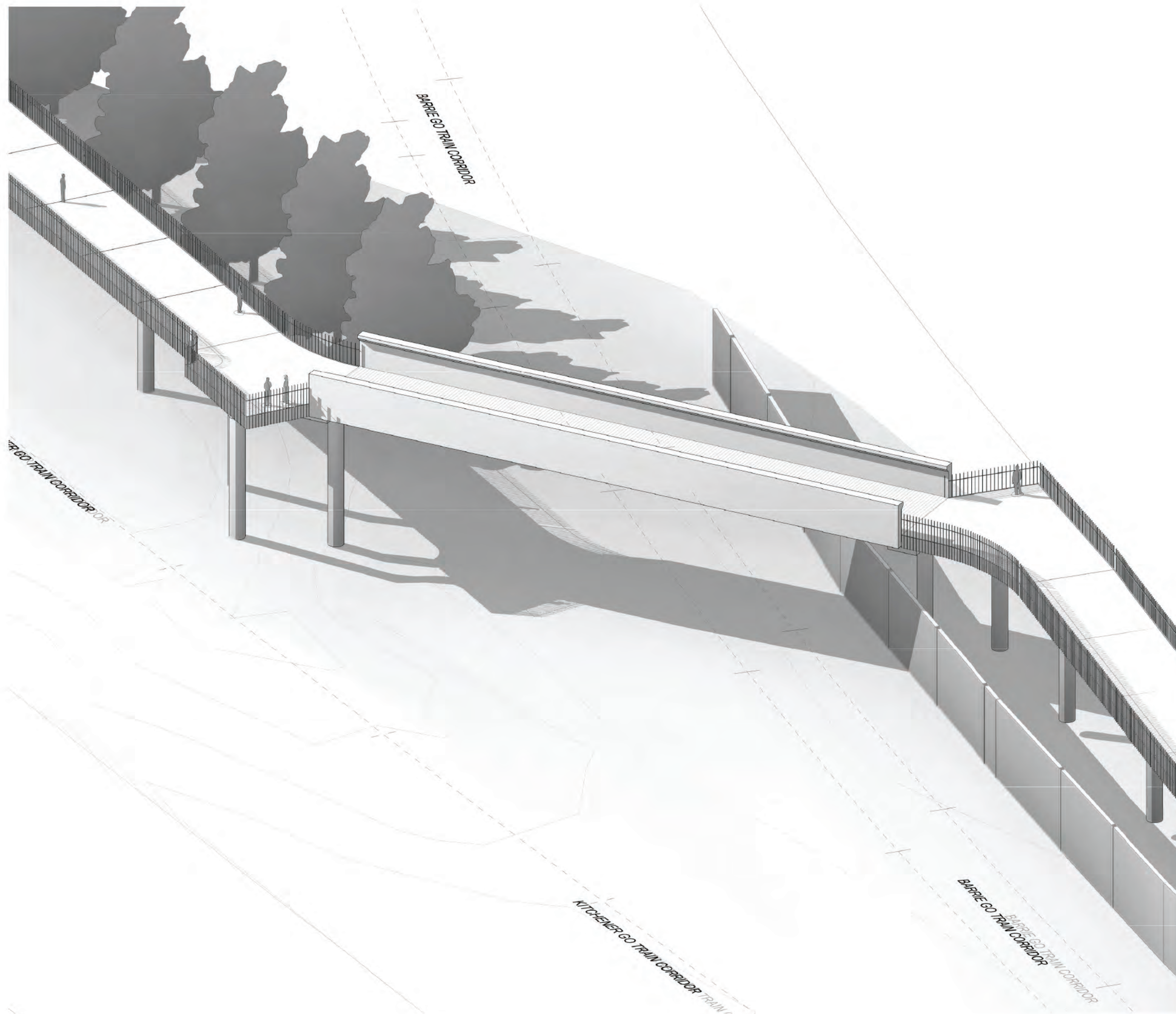


BARRIE RAIL CORRIDOR PEDESTRIAN-CYCLE BRIDGE

Bridge Options

A / Concrete U-Girder



Axonometric View
Bridge Option A / Concrete U-Girder

Bridge Section
Bridge Option A / Concrete U-Girder



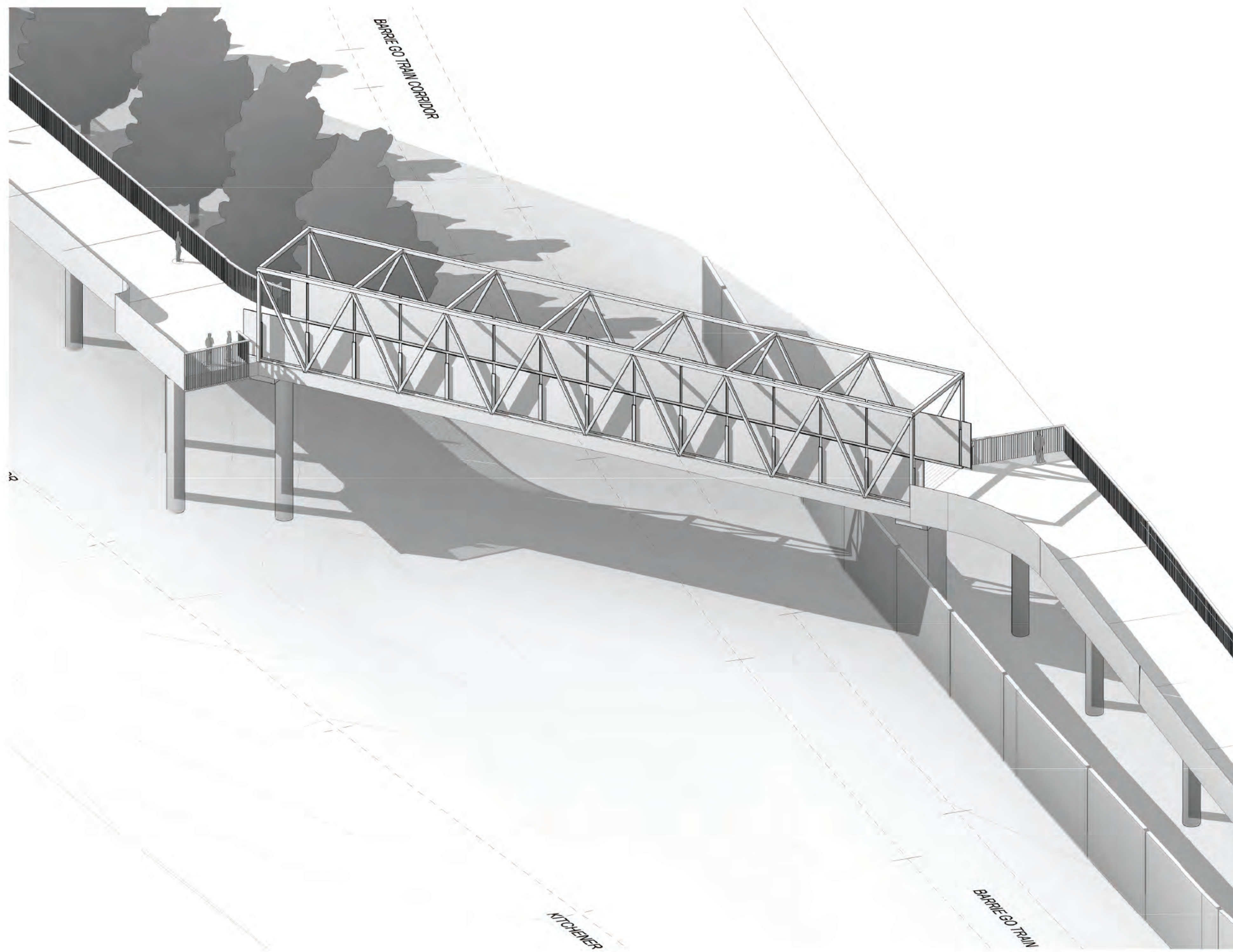
Approaching the Bridge from the North (Looking South)
Bridge Option A / Concrete U-Girder



View on the Bridge Deck (Looking West)
Bridge Option A / Concrete U-Girder

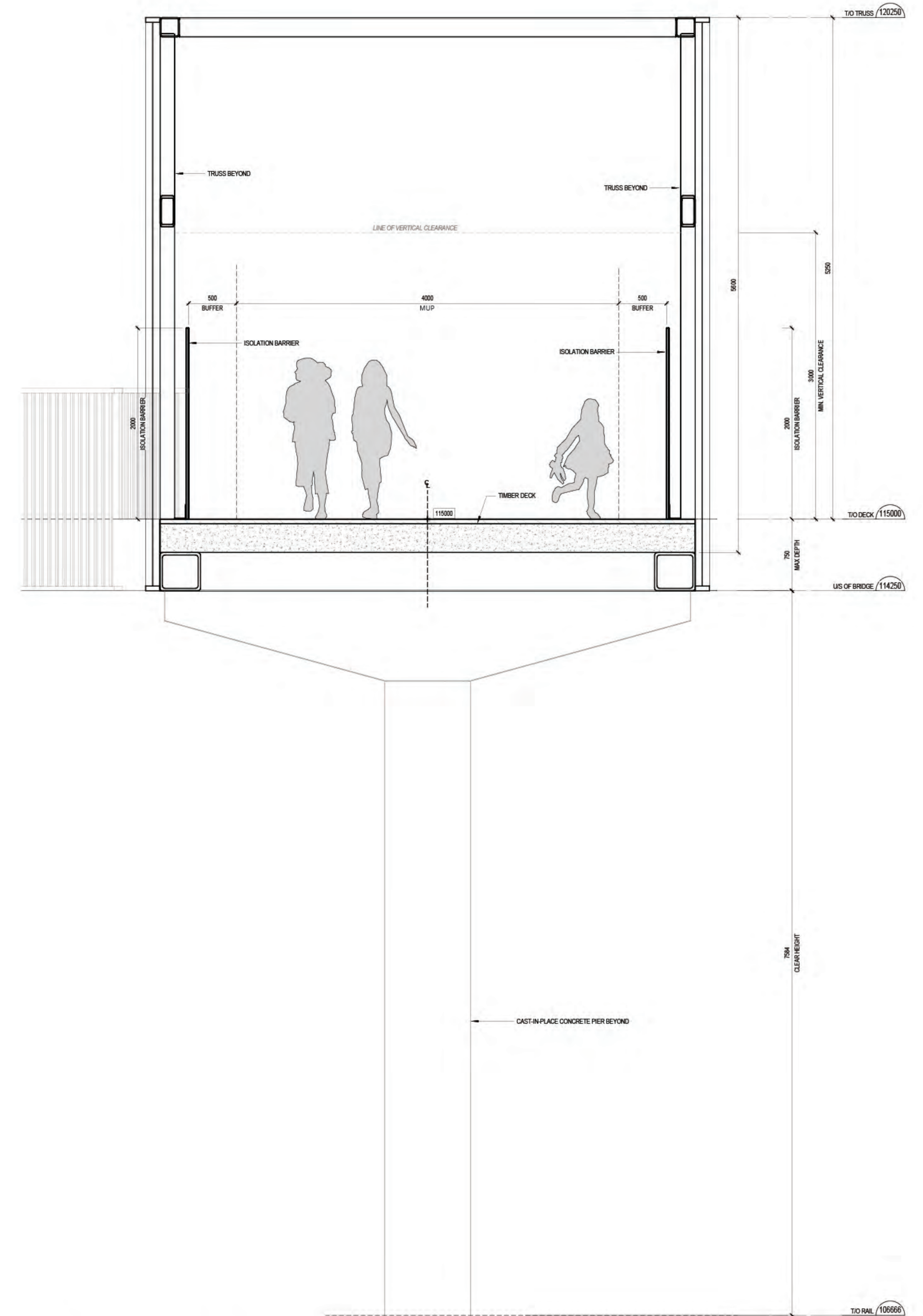
Bridge Options

B / Steel Truss



Axonomic View

Bridge Option B / Steel Truss



Bridge Section

Bridge Option B / Steel Truss



Approaching the Bridge from the North (Looking South)



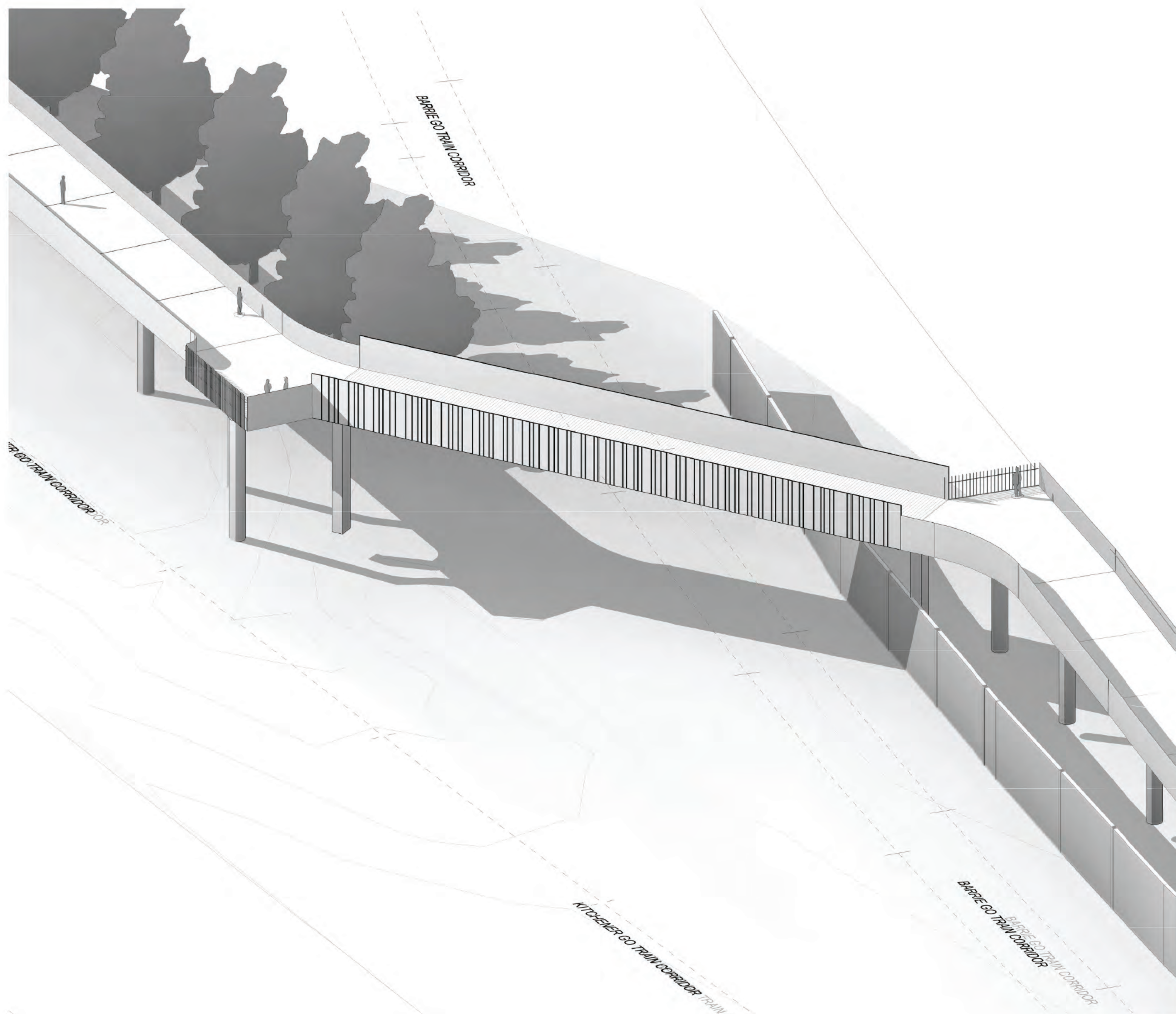
View on the Bridge Deck (Looking West)

Bridge Option B / Steel Truss

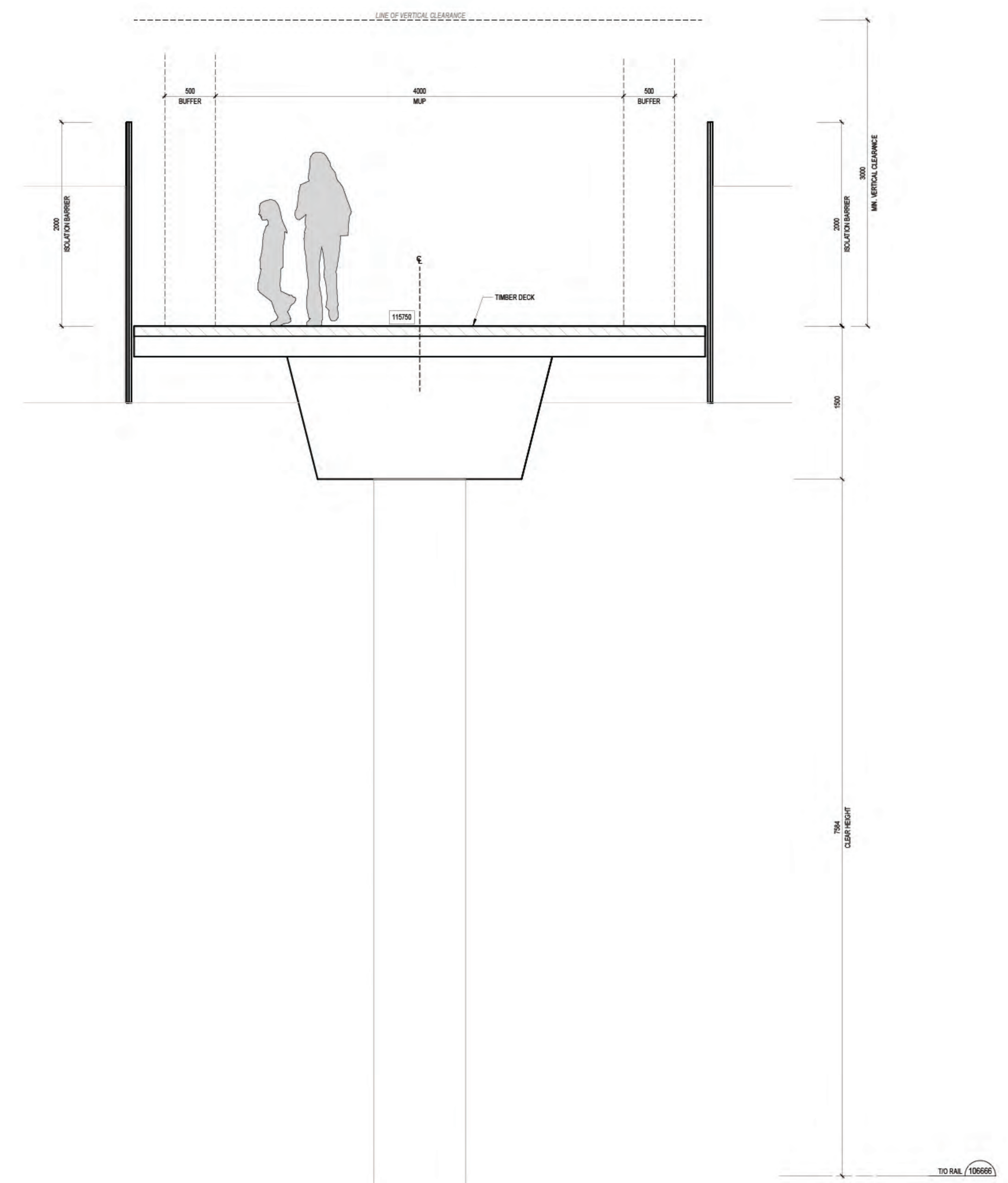
BARRIE RAIL CORRIDOR PEDESTRIAN-CYCLE BRIDGE

Bridge Options

C / Steel Box Beam



Axonometric View
Bridge Option C / Steel Box Beam



Bridge Section
Bridge Option C / Steel Box Beam



Approaching the Bridge from the North (Looking South)
Bridge Option C / Steel Box Beam



View on the Bridge Deck (Looking West)
Bridge Option C / Steel Box Beam

BARRIE RAIL CORRIDOR PEDESTRIAN-CYCLE BRIDGE

Bridge Options Evaluation Matrix

Scored Out of			A	B	C
			Concrete U-Girder	Steel Truss	Steel Box Beam
Performance Criteria	Vertical Climb	3	3	3	1
	Crime Prevention	3	1	1	1
	Durability & Maintenance	3	3	2	1
	Vandalism Resistance	3	2	3	3
SUBTOTAL			9	9	6
Implementation Criteria	Construction & Staging Complexity	3	1	3	2
	Fabrication Competitiveness	3	1	1	1
SUBTOTAL			2	4	3
Experiential Criteria	Landmark	3	1	3	1
	Deck Experience	3	1	3	1
	Coherence & Continuity	3	1	3	1
SUBTOTAL			3	9	3
TOTAL			14	22	12

PREFERRED
BRIDGE
OPTION

B: Steel Truss out-performs other bridge span alternatives significantly in the Experiential Criteria category, and marginally outperforms others in Implementation category.

Barrie Corridor Bridge Design Alternatives

The bridge crossing over the Barrie Metrolinx Corridor represents a unique signature moment along the WTRPE. As such, three structural span options have been put forward and evaluated to ascertain the most well-suited structure. The preferred option has been identified based on competing criteria (see 2.3 Barrie Corridor Bridge Design Evaluation). For all of the three bridge span options, the design criteria are consistent.

Bridge Span Alternative A: Concrete U-Girder
A pre-cast concrete u-girder, landing on cast-in-place concrete piers.

Benefits of this option include robust and durable finishes which require little additional treatment to achieve design criteria.

Challenges of this option include technical staging and lifting pose challenges to the heavy structural component. The long span required is not well suited to this structure type resulting in a correspondingly deep deck depth, requiring additional height to meet clearance requirements over the rail corridor, and additional climb for pedestrian and cyclists.

Bridge Span Alternative B: Steel Truss
A steel warren truss with concrete deck, landing on cast-in-place concrete piers.

Benefits of this option include a narrow bottom chord structure which allows the bridge deck surface to be low, representing savings in ramp length and beneficially low climbs to cross the rail corridor. The truss structure readily allows for barrier attachment. The relatively light structure is ideal for staging and installation with minimal disruption to the rail corridor. This structure type replicates bridge spans at Lansdowne and Brock, enforcing a strong 'family of bridges'.

Challenges of this option include detailing to prevent the deleterious accumulation of water at steel joints.

Bridge Span Alternative C: Steel Box Beam
A steel box beam, landing on cast-in-place concrete piers.

Benefits if this option include continuity of structural type from Elevated Railpath sections, offering economy and efficiency

Challenges of this option include a relatively deep deck structure, requiring additional height to meet clearance requirements over the rail corridor, and additional climb for pedestrians and cyclists.

Barrie Corridor Bridge Design Evaluation

In order to assess the bridge span options with the goal of finding the best fit based on competing criteria, an evaluation matrix has been composed. The following criteria have been used;

Vertical Climb means to what extent does the depth of the deck structure contribute to the lowest possible vertical climb for pedestrians and cyclists. This criterion has an importance factor of 2 as this score corresponds with the ramp length and slope required to achieve vertical clearance requirements.

Crime Prevention means to what extent does the structural span option contribute to blind-spots along the WTRPE. Contributing factors may include...

Durability & Maintenance means to what extent the structure will require maintenance and/or remediation over its lifespan. Contributing factors may include required patching of surfaces, re-treatment of protective coatings, or access to unobservable voids for inspection.

Vandalism Resistance means to what extent the structure is prone to graffiti or destructive nuisance. Contributing factors may include long exposed surfaces prone to tagging or materials that are readily defaced.

Construction & Staging Complexity means to what extent the structure is easily assembled and installed on site. Contributing factors may include weight, length of components, and capacity for off-site fabrication.

Fabricator Availability means to what extent the structure is likely to solicit multiple competitive bids on tender. Contributing factors may include commonality of structural type.

Landmark means to what extent the structure creates a strong sense of place from a distance. Contributing factors may include a strong profile from a distance.

Deck Experience means to what extent the structure creates a strong sense of place on the deck. Contributing factors may include a distinctive sense of enclosure.

Coherence & Continuity means to what extent the structure fits with its context. Contributing factors may include materiality or repetition of other familiar structures.

Bridge Design

The Barrie Corridor Bridge is comprised of three parts; (1) Elevated Railpaths, the sloped approaches to the bridge; (2) the Landings, and; (3) the Bridge itself which spans across the rail corridor.

(1) Elevated Railpaths
The rail paths achieve slopes less than 5%, and are furnished with guards on either side to protect from falling hazards. Two types of guards are utilized;

Type 1 is a solid metal guard generally along the rail corridor side of the railpaths, to create a strong sense of separation and safety from the active rail operations, and;

Type 2 a steel picket guard generally on the city or street side of the railpath to preserve visibility of WTRPE users from occupied areas.

A handrail is proposed on the up-slope side of these areas for convenience and comfort, and to enhance accessibility.

(2) Landings
The landings are designed to be generous and accommodate comfortable turning maneuvers on bicycle. Excess landing area is provided to allow for repose outside of the active path of travel. The landing geometry importantly resolves and normalizes alignment between the Elevated Railpaths and the Bridge, and future connections, all of which converge in an irregular arrangement.

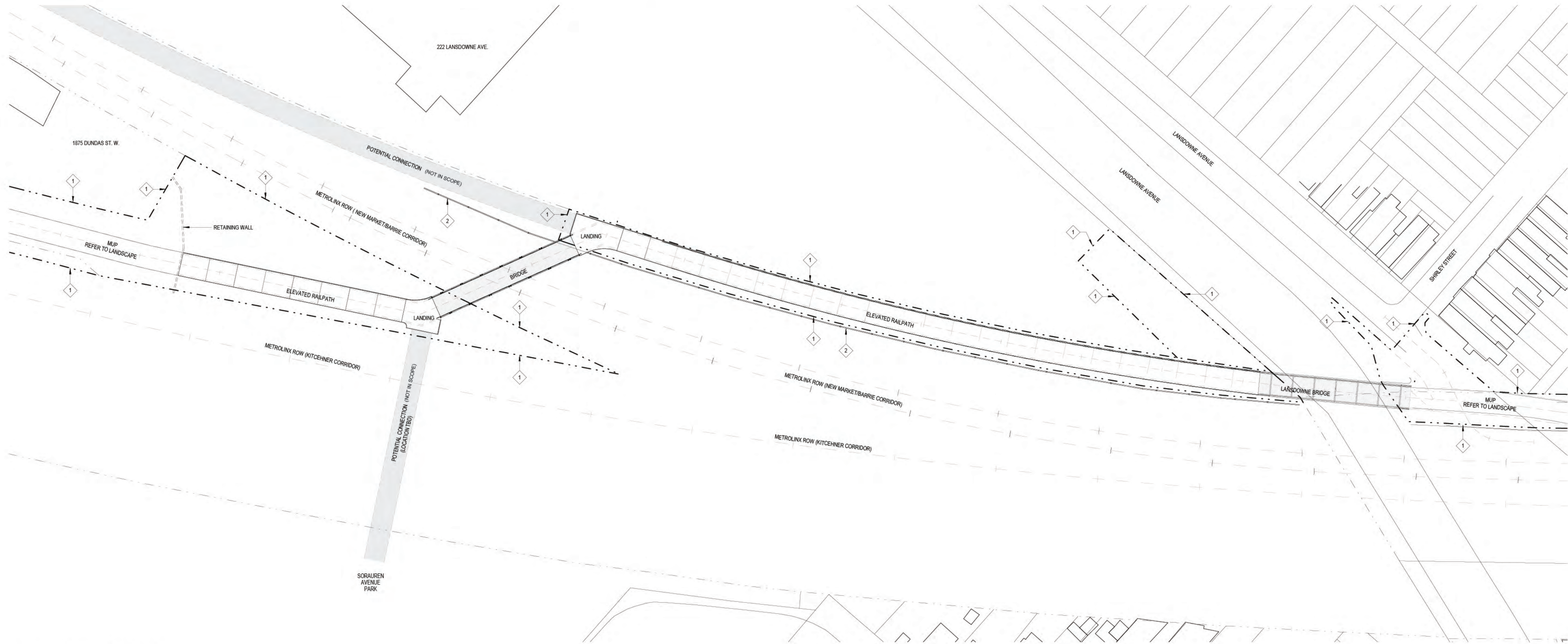
(3) Bridge
The structure is a steel warren truss, approximately square in proportion. The steel structure will accommodate lighting and guard attachment.

Guards are provided per Metrolinx criteria. Continuous 2m steel panels are provided along the entire length of the bridge span. Supplementary full-height steel picket guards are proposed for added measure, bringing the protected guard height to approximately 5m over the rail corridor.

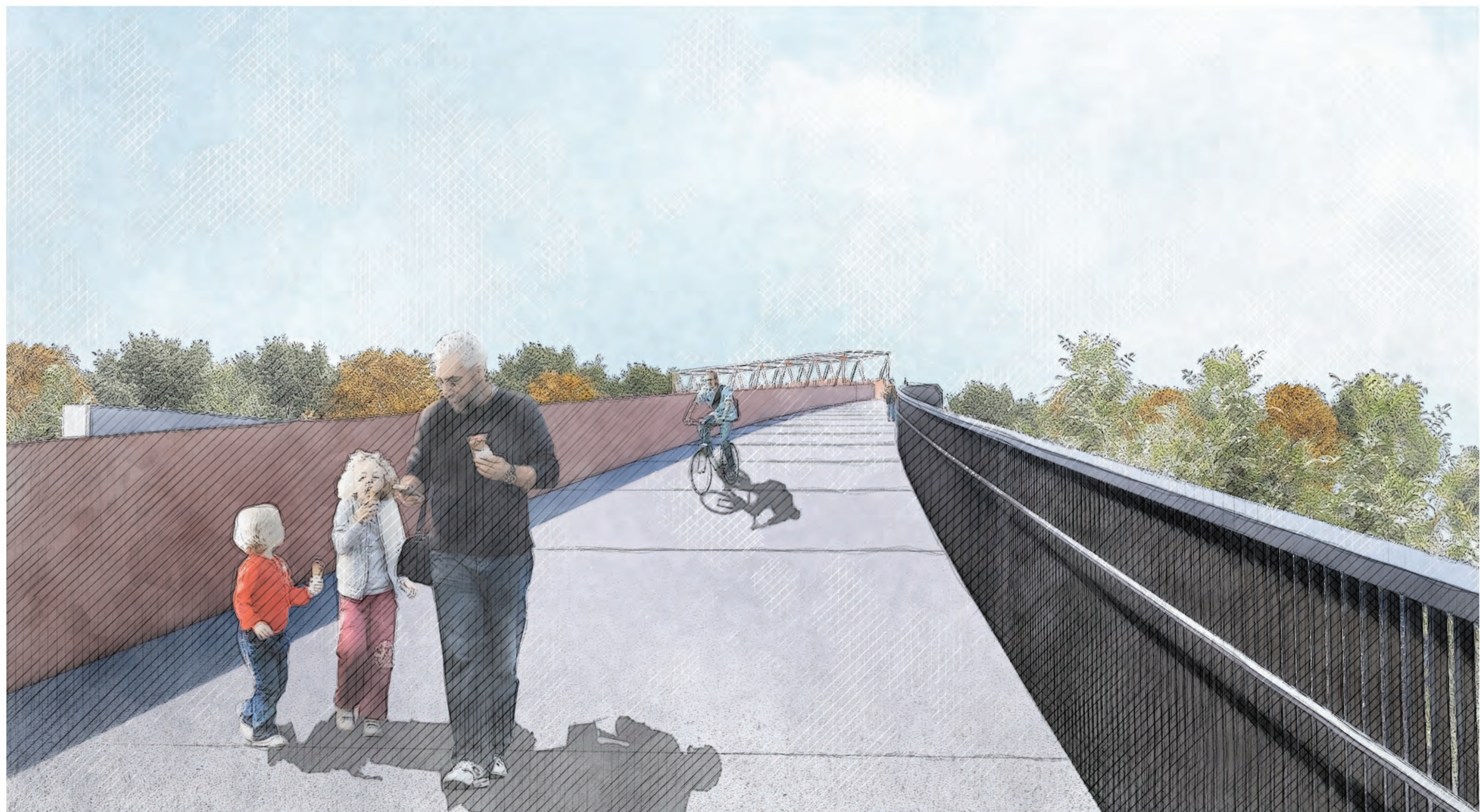
The deck is to be finished in timber for consistency with other bridges further north on the existing WTRP. The repetition of this tactile experience contributes to a strong experiential consistency along the WTRP and WTRPE as a whole.

BARRIE RAIL CORRIDOR PEDESTRIAN-CYCLE BRIDGE

Preferred Bridge *B / Steel Truss*

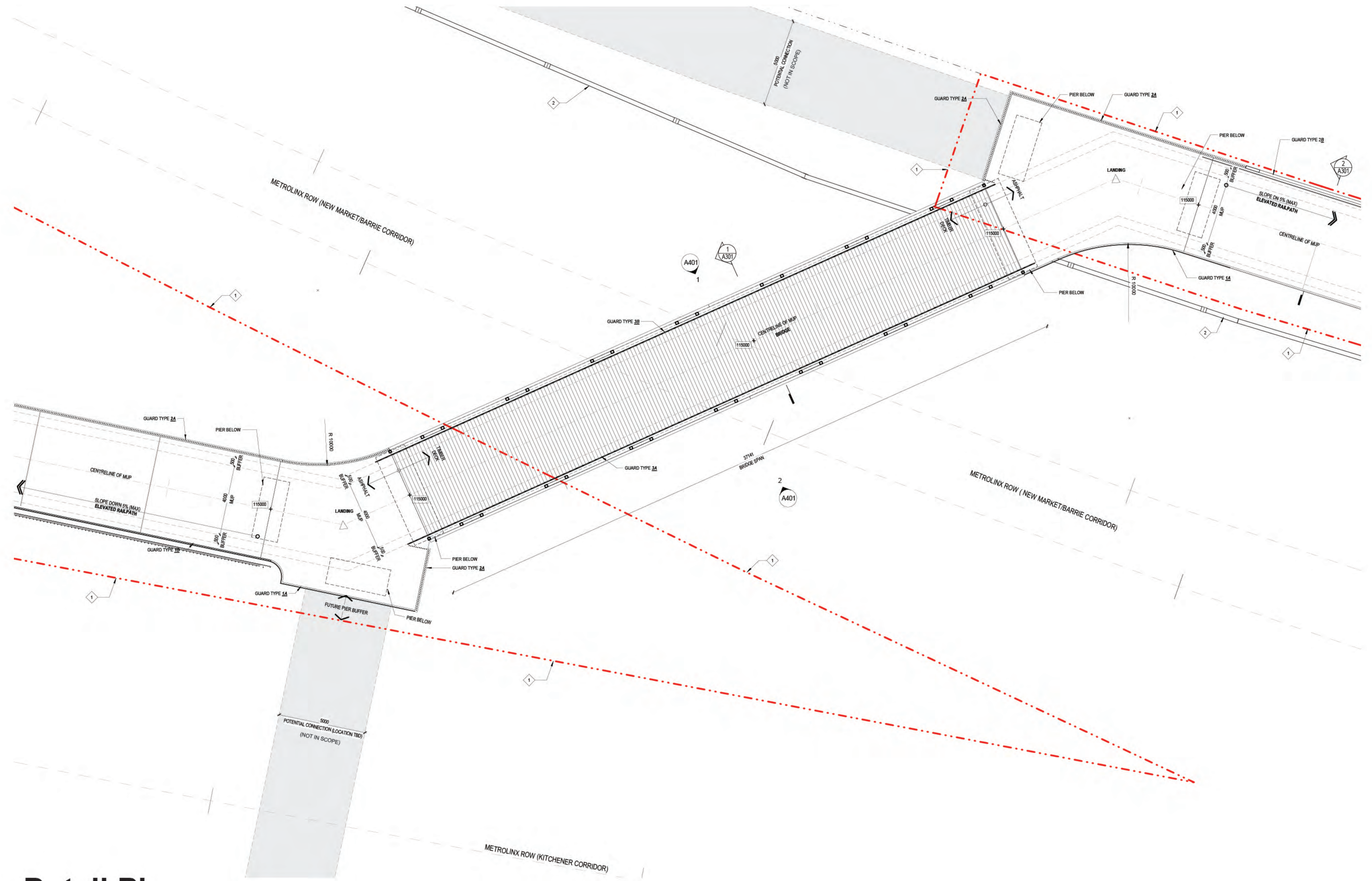


Context Plan
Bridge Option B / Steel Truss



Elevated Rail Path Looking North
Bridge Option B / Steel Truss

Preferred Bridge B / *Steel Truss*



Bridge Span Detail Plan

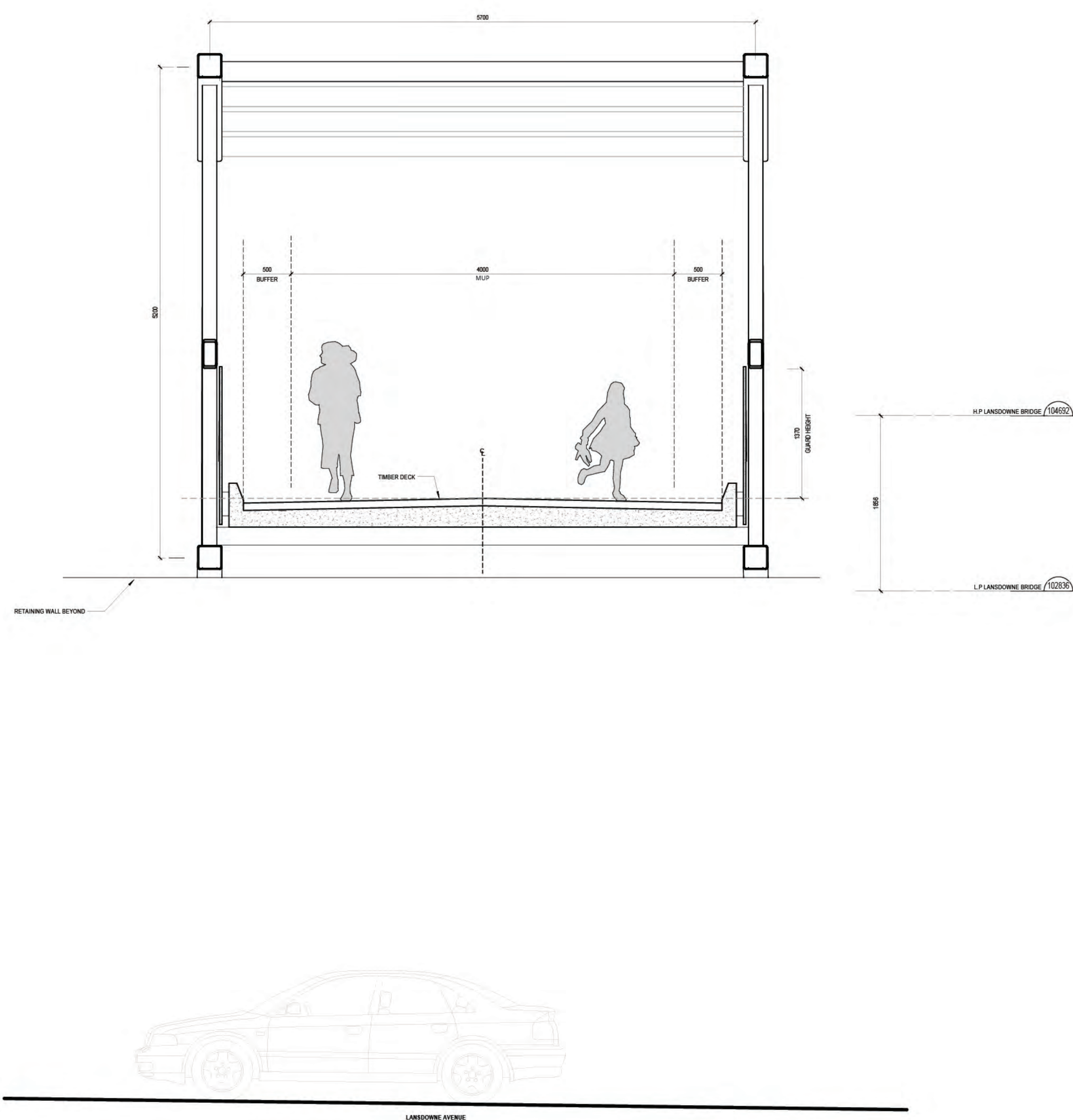
Bridge Option B / Steel Truss



Elevated Rail Path approaching the Bridge from the South (Looking North)
 Bridge Option B / Steel Truss

LANSDOWNE, BROCK, & QUEEN STREET PEDESTRIAN-CYCLE BRIDGE

Steel Truss



Note:
Roadway Overpass Bridge shown at
Lansdowne Avenue for illustrative
purposes, but typical also at Brock Ave
and Queen Street W.

Bridge Section
Roadway Overpass Bridge (Typical)



View on the Bridge Deck
Roadway Overpass Bridge



View on the Bridge from Roadway
Roadway Overpass Bridge