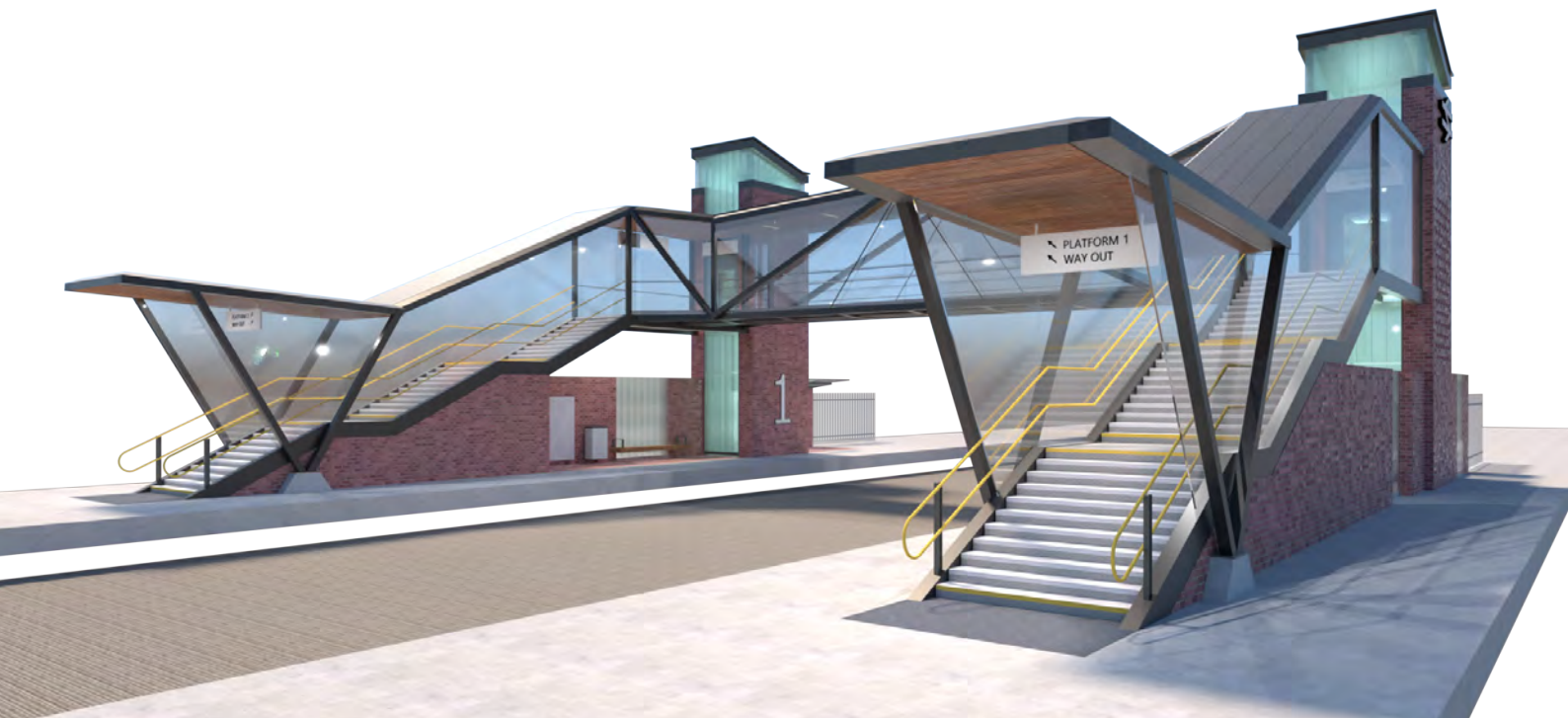


# Network Rail Station Footbridge



## Design Brochure

April, 2019



**Haskoll**  
Architects and Designers

**Davies  
Maguire**

To deliver and maintain world class rail assets that provide the **heartbeat** for our nation's transport system.

Our vision applies across our built environment and is guided by our responsibility to deliver through good design a safe and reliable railway to the millions of people who use it daily. We want our assets to be sustainable and our vision should enable us to deliver outstanding value for taxpayers and customers. Our **heartbeat** is driven by our ambition to strengthen our existing network and estate.

#### Our Principles of Good Design:



Identity



Community focused



Inclusive



Enhancing heritage



Connected



Contextual



Innovative



Collaborative

## Station type



- Local stations
- Commuter stations
- 2 or 4 platform stations
- UK wide locations
- Urban and rural locations
- Adaptable to context

This bridge design provides a new standard footbridge, which can be used in many stations across the network. It is aimed primarily at smaller local and commuter stations, as major stations will likely have a wider range of challenges with specific needs to address.

This bridge is suitable for spans of up to 20m, although multiple spans are possible, such as in 4 platform stations. Stairs and lifts are provided at all platforms and comply with relevant accessibility regulations. The bridge can be used in stations with or without OHLE. The bridge is designed to be adaptable to suit the parameters and requirements of specific stations, maximising its potential use. A range of materials are available for cladding so that the bridge can respond to local context.



# Bridge Design

## Entry

- Open and Inviting
- Simple and legible expression
- Entrance structure given primacy
- Motor room suppressed
- Maximised visibility

## Corner/undercroft

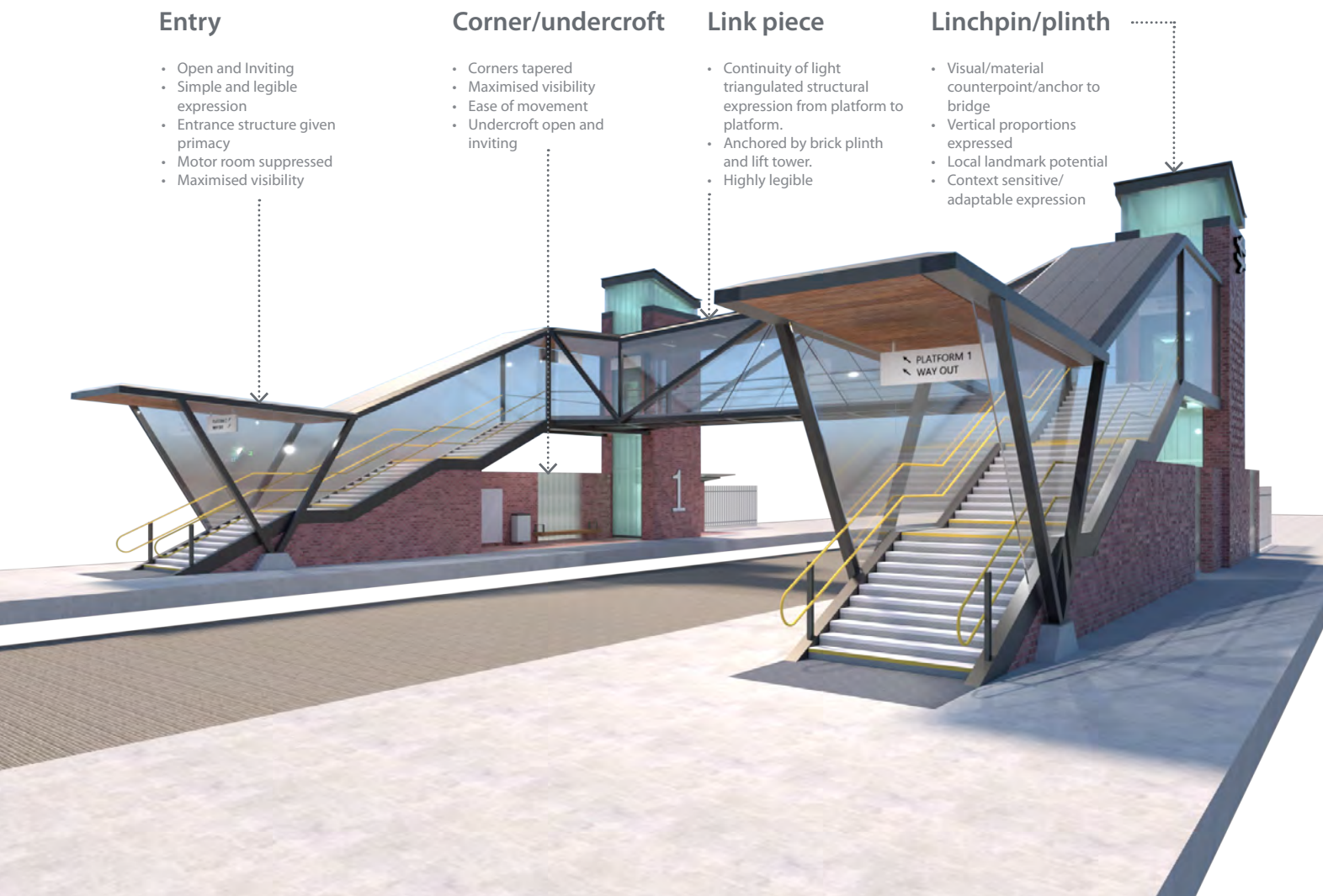
- Corners tapered
- Maximised visibility
- Ease of movement
- Undercroft open and inviting

## Link piece

- Continuity of light triangulated structural expression from platform to platform.
- Anchored by brick plinth and lift tower.
- Highly legible

## Linchpin/plinth

- Visual/material counterpoint/anchor to bridge
- Vertical proportions expressed
- Local landmark potential
- Context sensitive/adaptable expression



## Vision

- To establish a high standard, design led approach to railway infrastructure
- To establish a legible NR design identity through standardised elements, materials, detailing and graphic language

## Design Criteria

- Be elegant and delightful
- Be user friendly and accessible to all users
- Be suitable for construction and maintenance in the railway environment
- Be cost effective and sustainable (whole life cost)
- Reflect a commitment to a high quality of industrial design



# Elevations



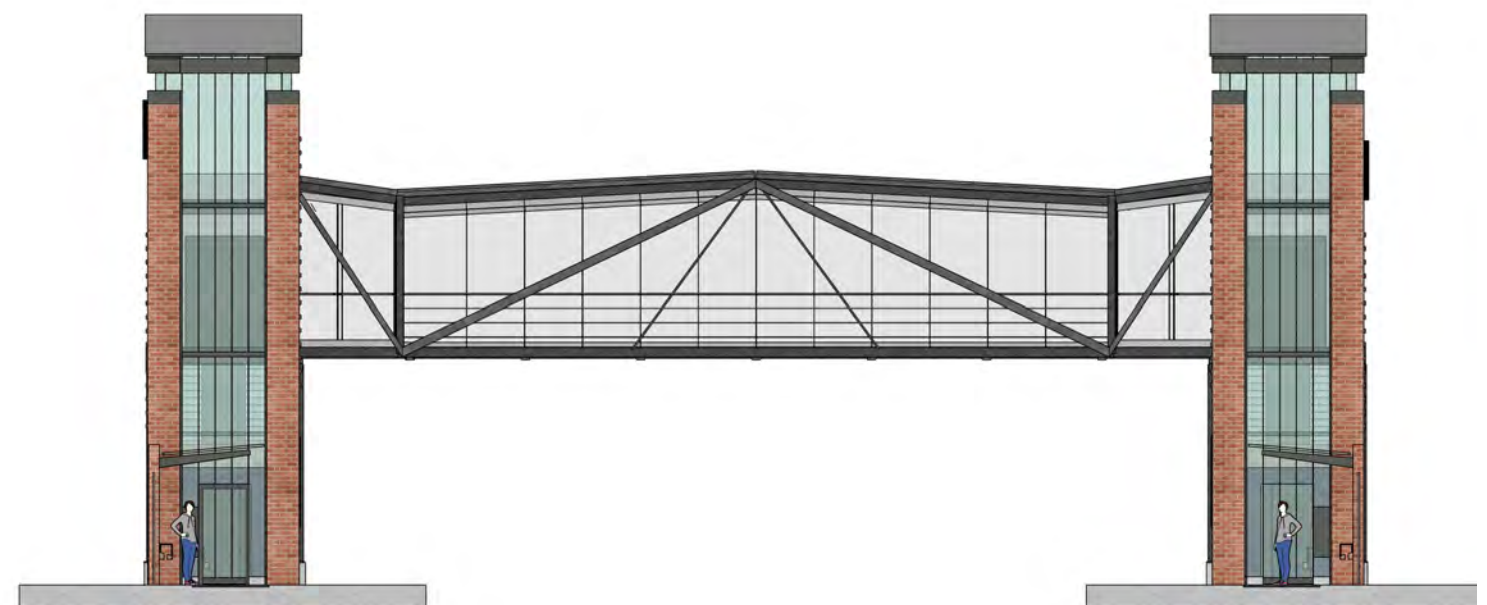
Elevation, External side



Elevation, Platform side



Elevation, Front



Elevation, Rear

# Plan

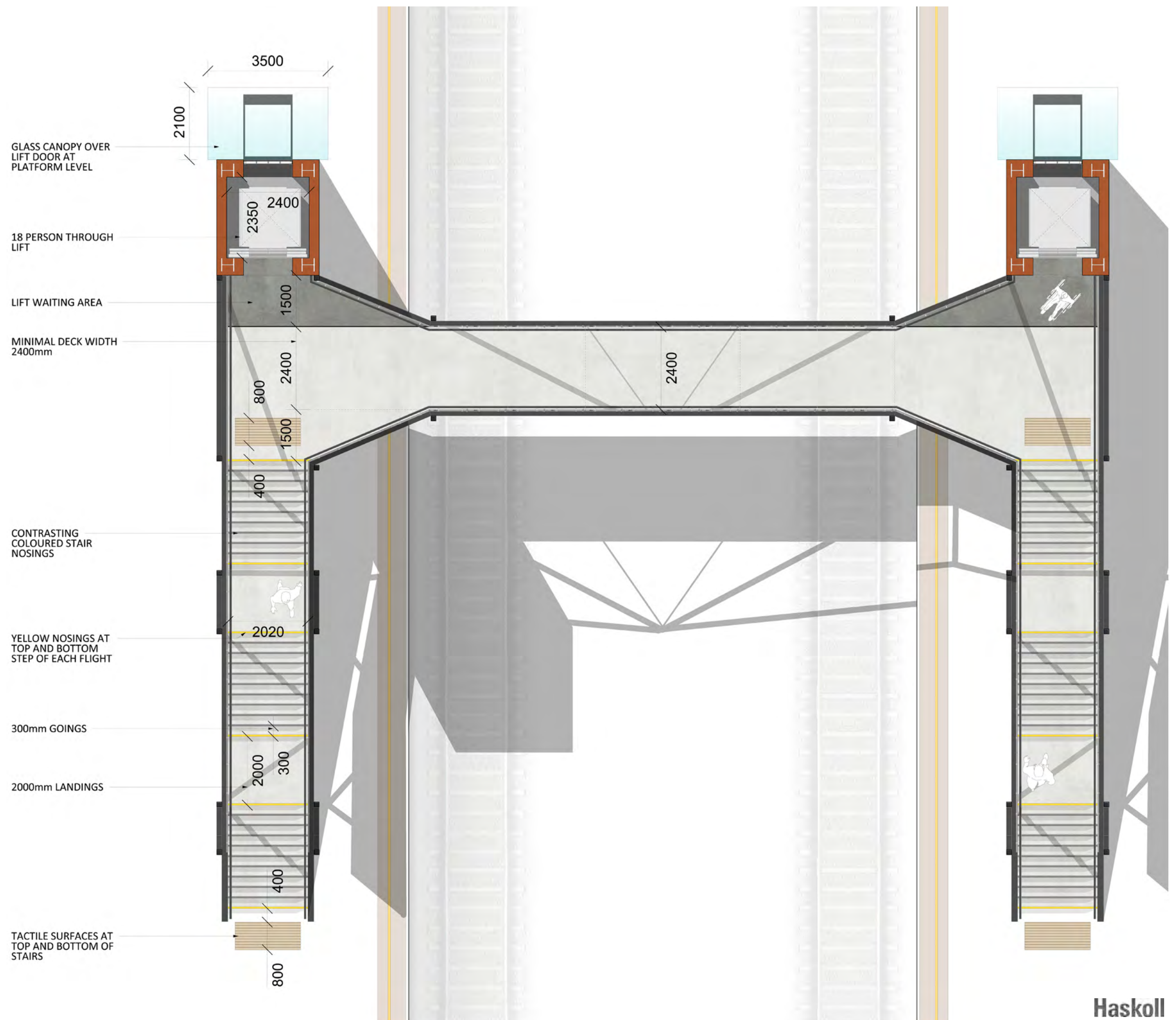
## Improving accessibility and pedestrian movement with tapered deck.

A key consideration in the design of the generic footbridge was the orientation of the main components of the stair, lift, and deck. The stair and lift are set back from the deck to allow landing spaces, and the connection between the landings and deck is tapered to allow for a more generous space at these key points.

The tapered deck provides more space at the conflict points, at the points where pedestrians change direction or speed, improving the flow of pedestrians at peak times.

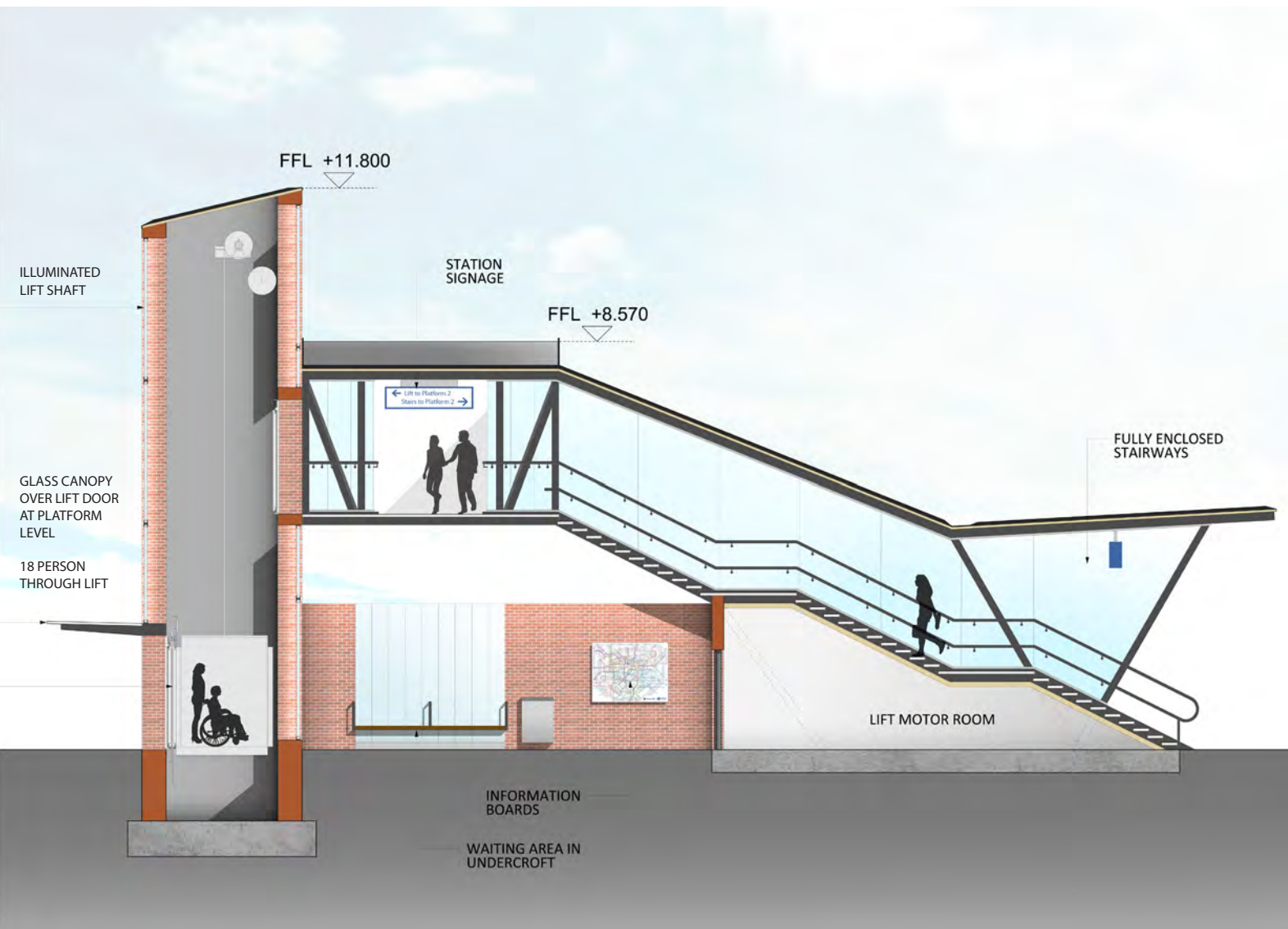
The lift shaft is immediately apparent when traversing the deck, as it is not hidden behind a corner, and the fully glazed walls as well as lighting and signage indicate its location.

Lifts, stairs and landings are compliant with all relevant accessibility standards.





# Section



## Removal of platform columns

The structure of the bridge has been designed so that lift shaft and the stair structure form an arch, off which the deck structure can be supported. This frees up platform space under the bridge where columns would ordinarily be found. The lift motor room is concealed under the stair structure.

# Glazing

## Fully glazed for maximum visibility

The standard bridge design is fully enclosed, with full height glazing to the stairs and deck. This makes the structure appear much lighter, and reduces the impact of what can be a large structure within existing station contexts.

Glazing provides good views out to the station and along the tracks, and provides protection for inclement weather. Ventilation above the ceiling helps keep the bridge cool in hot weather.

Fixed glazing on the stairs and the tapers is supported by head and base tracks, with only a silicon joint at the vertical junctions of the panels.



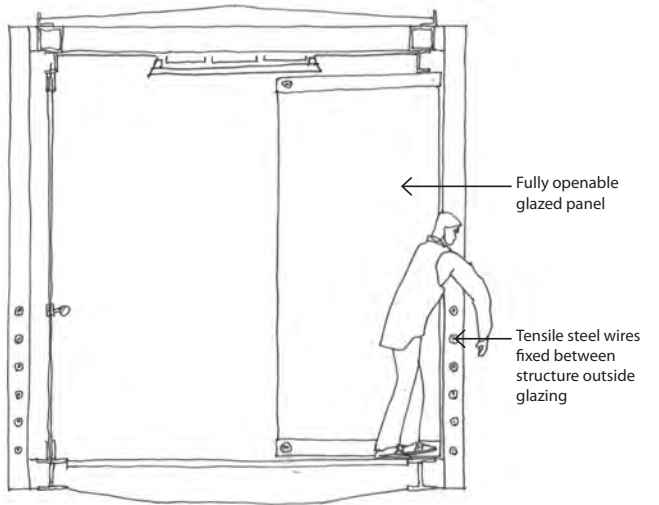
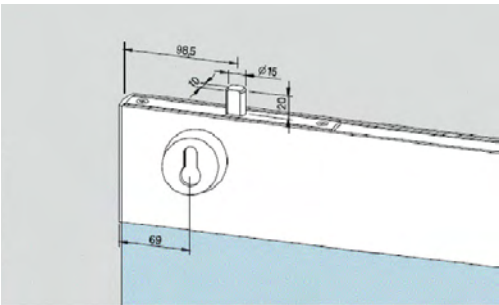


# Openable Glazing

## Aids cleaning over the tracks

Over the tracks, the glazing must be able to be cleaned for the inside. Along the length of the deck, the glazing panels are hinged so they can be opened and cleaned from the inside. The openeable glazing has hinges and locks integrated into the head and base channels, so no vertical frames are required. This is as you would see on the doors of a glazed shopfront.

Tensile steel wires are fitted to the structure outside the glazing. These act as a fall protection system for operatives who are required to clean the glass.



# Ceilings - deck



Feature lighting above slats



Slat profile



## Installation made easy – four simple steps

Step 1.
Simply fix your L-shaped trim to the walls as a level border.

Step 2.
Place rails up to 600mm apart

Suspended ceiling
Direct fix to ceiling

Step 3.
Place the plastic clips onto the battens approximately 600mm apart. The clips slide for minor adjustments.

Step 4.
Now you're ready to start inserting your timber lengths. Simply push the timber up, clicking the clips into the rails.

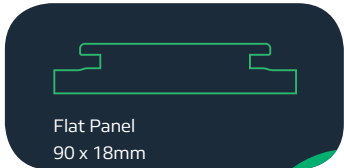
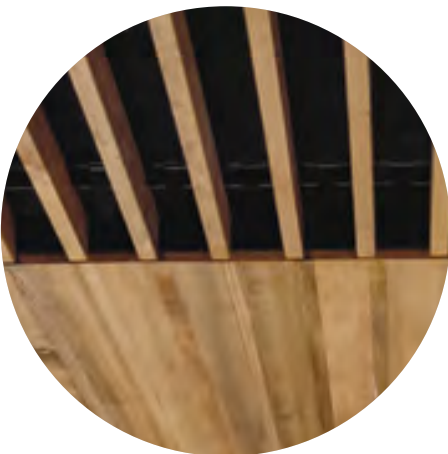
Timber slats are suspended below the structure as in the diagram to the left. services and lighting run in the space between the timber slats and the structure.

Lighting is integrated within and behind the slats, so there are no protruding objects below the plane of the ceiling.

Services are easily accessed through the slats, or by removing slats where necessary. Individual slats can be replaced if they become damaged.



# Ceilings - stairway



Flat Panel  
90 x 18mm

At the stairway entrance, the profile of the timber ceiling will change to become a continuous flat soffit, rather than an open slat ceiling.

This provides a solid finish for the important entrance where the roof is turned upwards.

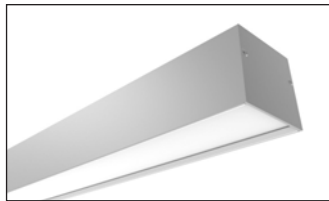
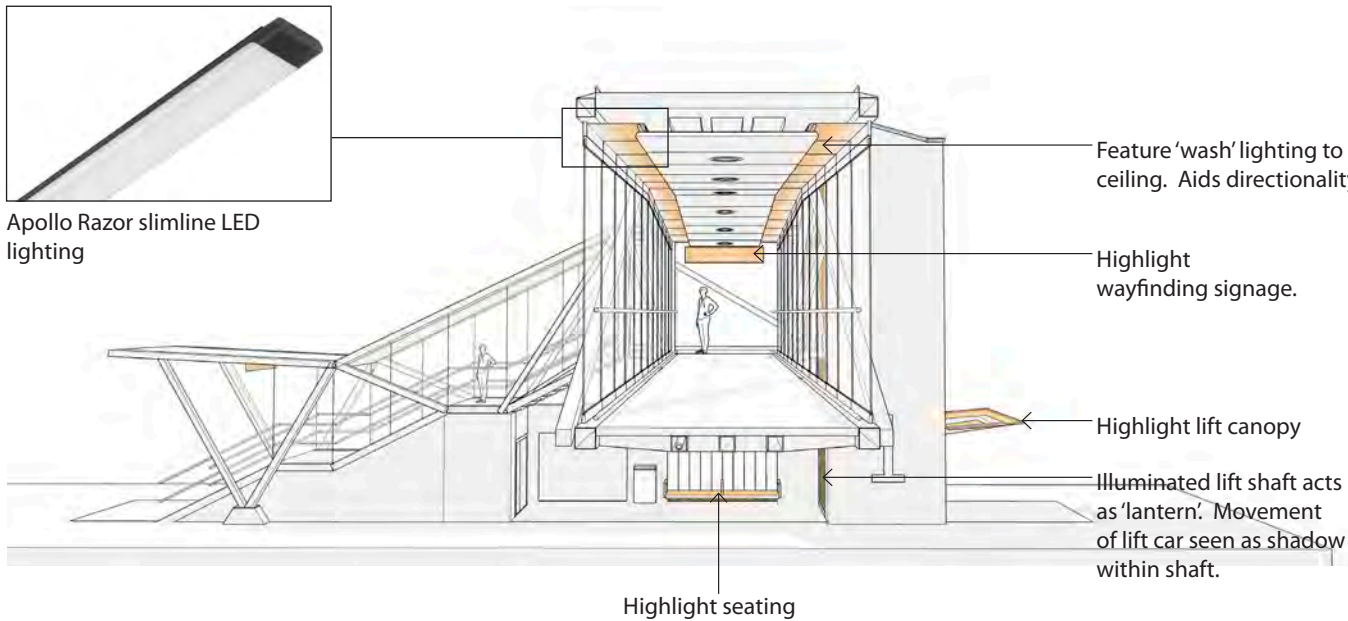
The warm timber material creates a visible, open and inviting entrance to the bridge.



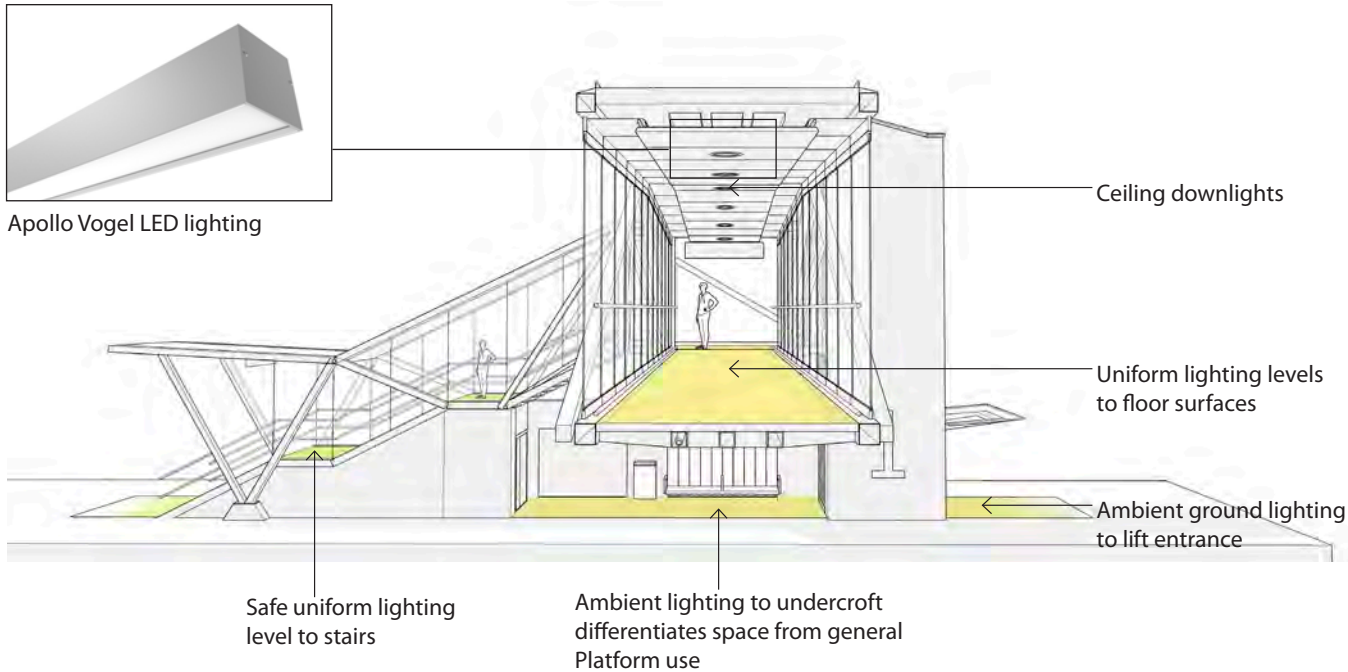
# Lighting



Apollo Razor slimline LED lighting



Apollo Vogel LED lighting



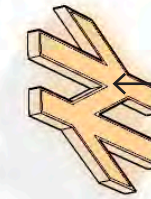


# Lift shaft lighting

Illuminated lift shafts improve visibility of lift location. Movement of lift car evident inside shaft.



Apollo Alya 4 LED lighting



British rail 'double arrow' logo on lift shaft totem, improving visibility of station from afar.





# Lift tower and plinth



Brick



A base material suitable for many station contexts

The base option uses brick to clad the lift shaft and stair plinth. Brick is widely used in stations across the country and is a material which is widely understood and available in most locations. The choice of brick type and colours can be tailored to suit local station environments.

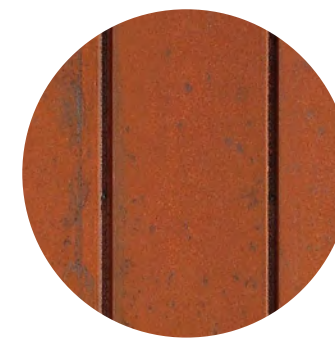
Local stone



Can be used to integrate with local vernacular

In stations or regions which have a strong heritage of a particular material, this material can be used as the footbridge cladding. This might be of particular relevance in heritage stations, or if there are planning conditions which must be met.

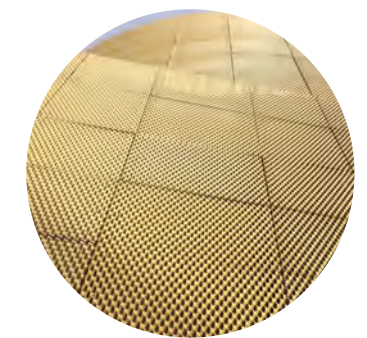
Corten



A striking, robust material

Corten is a striking modern material which has a bold yet refined character. It is extremely robust and requires little or no maintenance once installed. Its industrial feel may be well suited to certain railway environments.

Metal Cladding

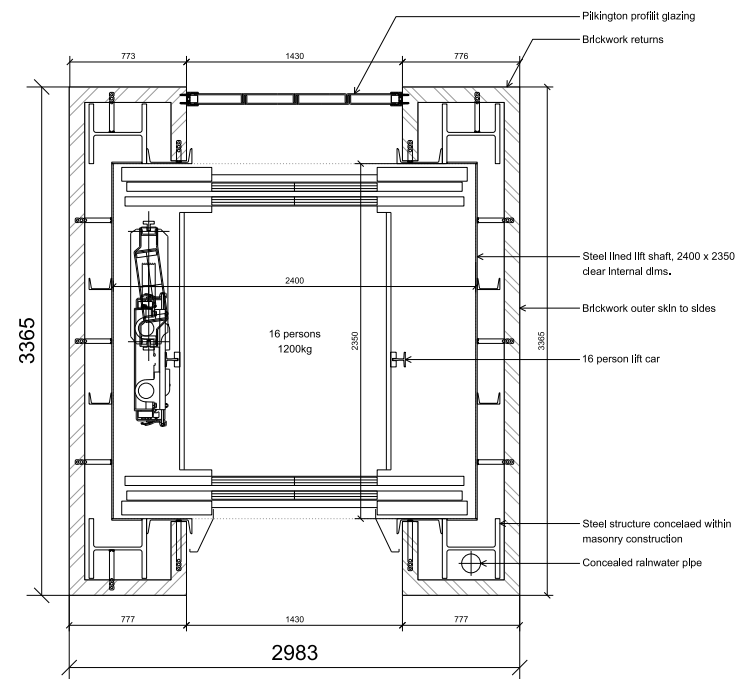


Available in a range of colours and forms

Metal cladding can come in a range of finishes and colours to suit local requirements. Metal cladding can be installed quickly and easily where space and/or time are limited.

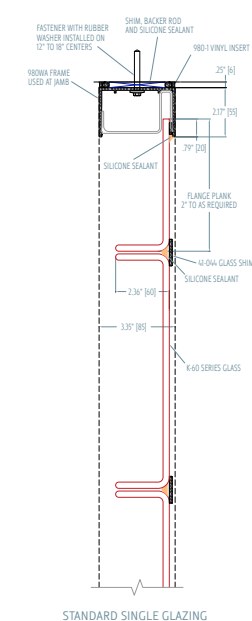


# Lift tower 'Lantern'



Steel Shaft
Brickwork Cladding

## Pilkington Profilit™



## Lift shaft cladding

As shown in the previous page, the cladding of the lift shaft can be tailored to suit local station context. However, the structure of the lift shaft behind this cladding remains constant, as shown in the details to the right, where the internal steel shaft remains a standard element, and claddings of different types and thicknesses may be applied on top.

At the front and back of the shaft, a frosted glass strip made of structural glass channels allows the shaft to be illuminated to improve visibility of the lift. as the car moves up and down with the shaft, its silhouette will be visible against the illumination.

The illumination of the lift shaft acts as a 'lantern' which can be seen from the areas surrounding the station. This acts to advertise the station's presence to passengers, and can become a focal point for the local area.



# Undercroft



Usable platform space

The space gained under the platform by the elimination of columns can be used for station facilities. In this example, seating and station information boards are located in this covered area. The materials used in the lift shaft are reflected in the materials of the undercroft, unifying the platform spaces below the bridge.

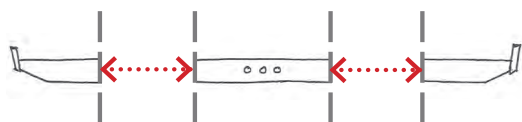
This treatment is extended to the entrance of the lift shaft, where a supporting wall matching the undercroft is used to provide cover and waiting benches adjacent to the entrance to the lift.



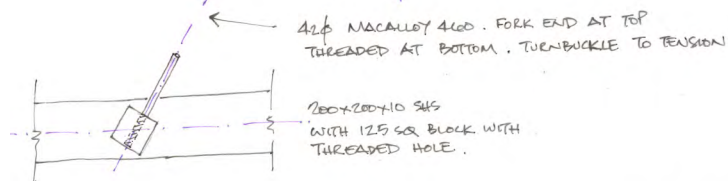
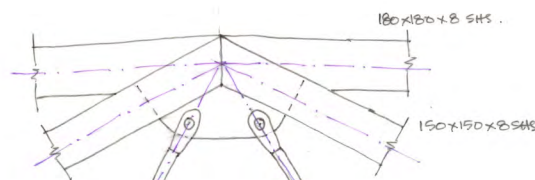


# Structure

## ADAPTABILITY

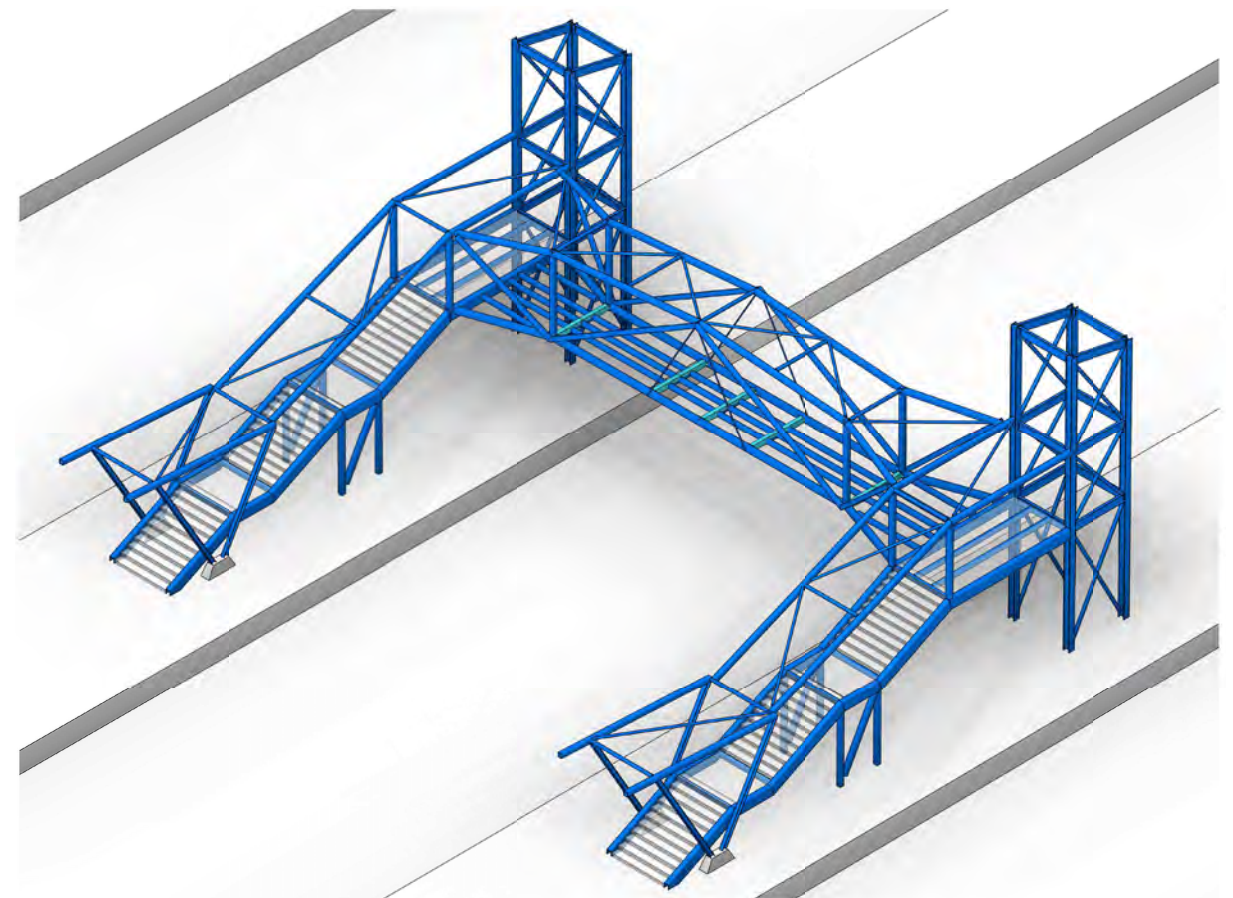
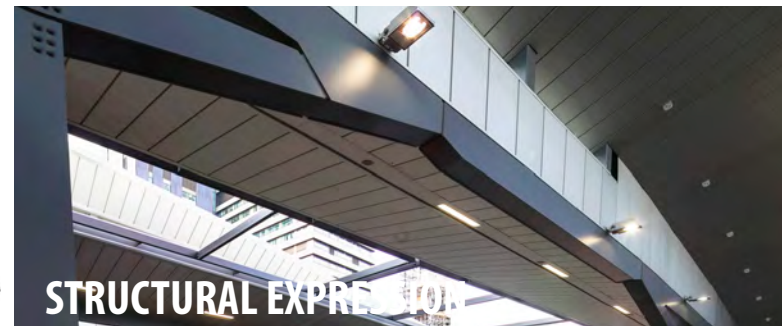
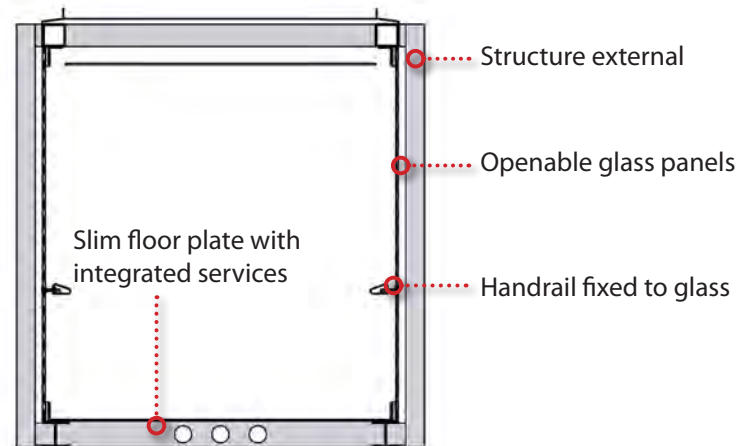


MAIN TRUSS CONNECTIONS : RODS.

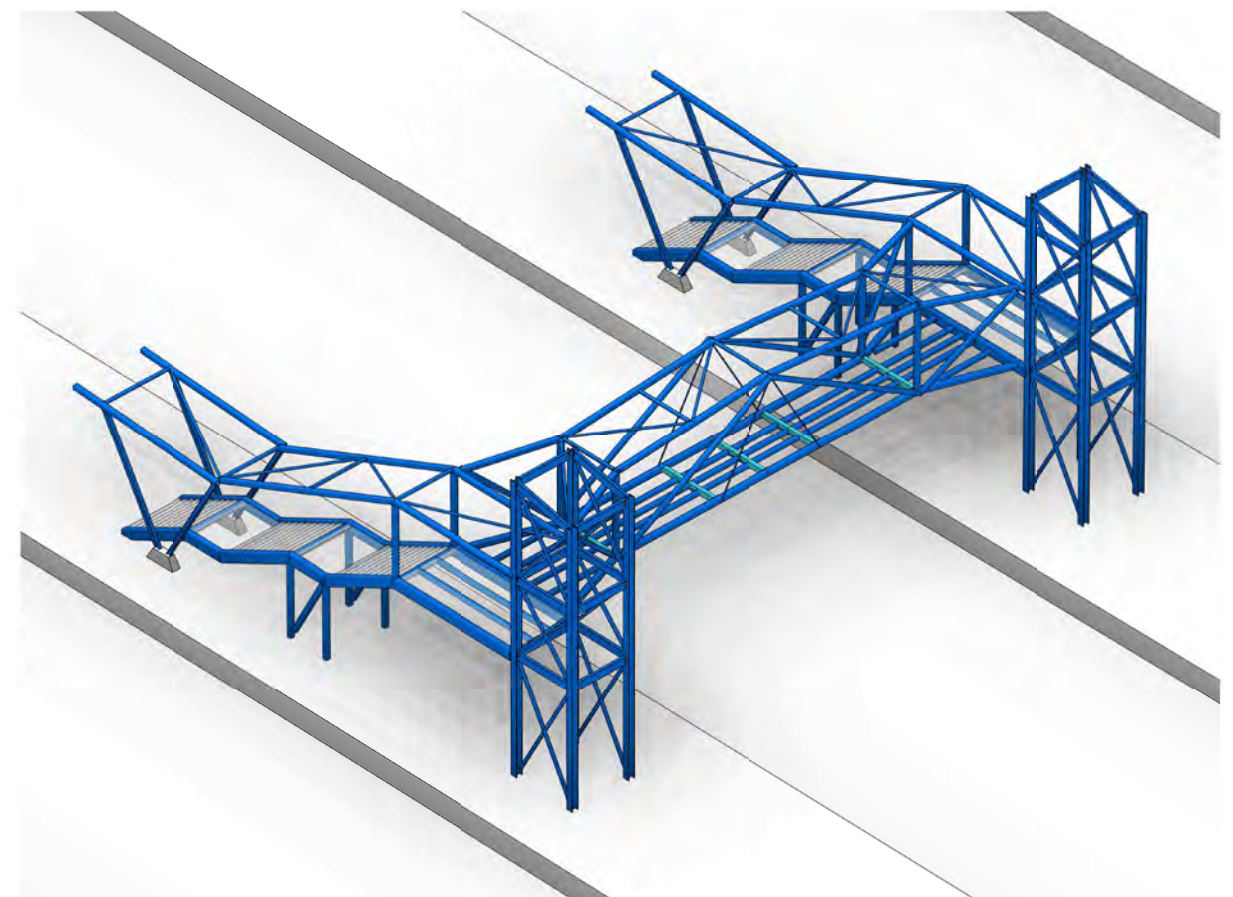


## Structural approach

The structure of the main span is a modern variant of a traditional structure often found in the railway environment – a steelwork truss. The use of the full depth of the enclosure enables the structural members to be lightweight and elegant. The theme of exposed structure continues down the staircases, with the stringers in full view.



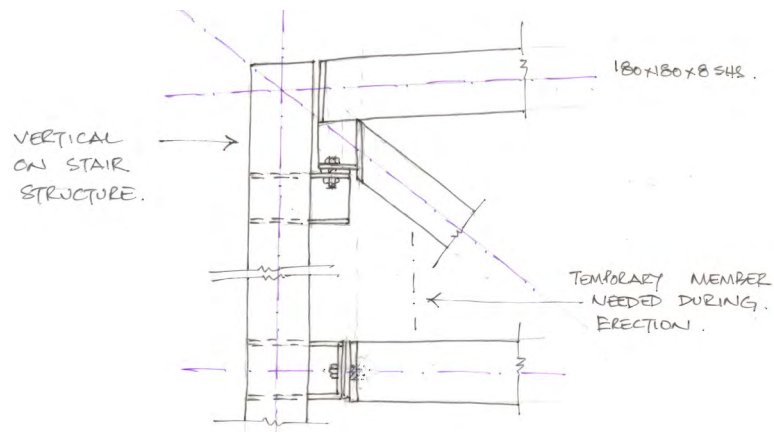
FULL 3D VIEW 01



FULL 3D VIEW 02



# Site constructability

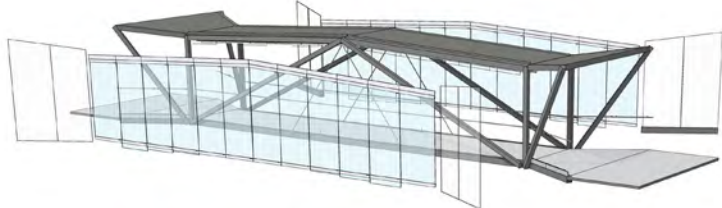


The visual importance of the lift tower is reflected in its structural importance. It is required to be in place to support the staircase stringers, and these in turn are required to support the main span. This dictates the sequence, with the final elements of the assembled trusses being lowered onto supports, all elements having been fabricated to standard steelwork tolerances.



Example showing bridge lifted in to place with crane

## 3. Bridge craned into place



## 2. Stairway lowered into place



## 4. Glazing installed



## 1. Lift towers and plinth constructed



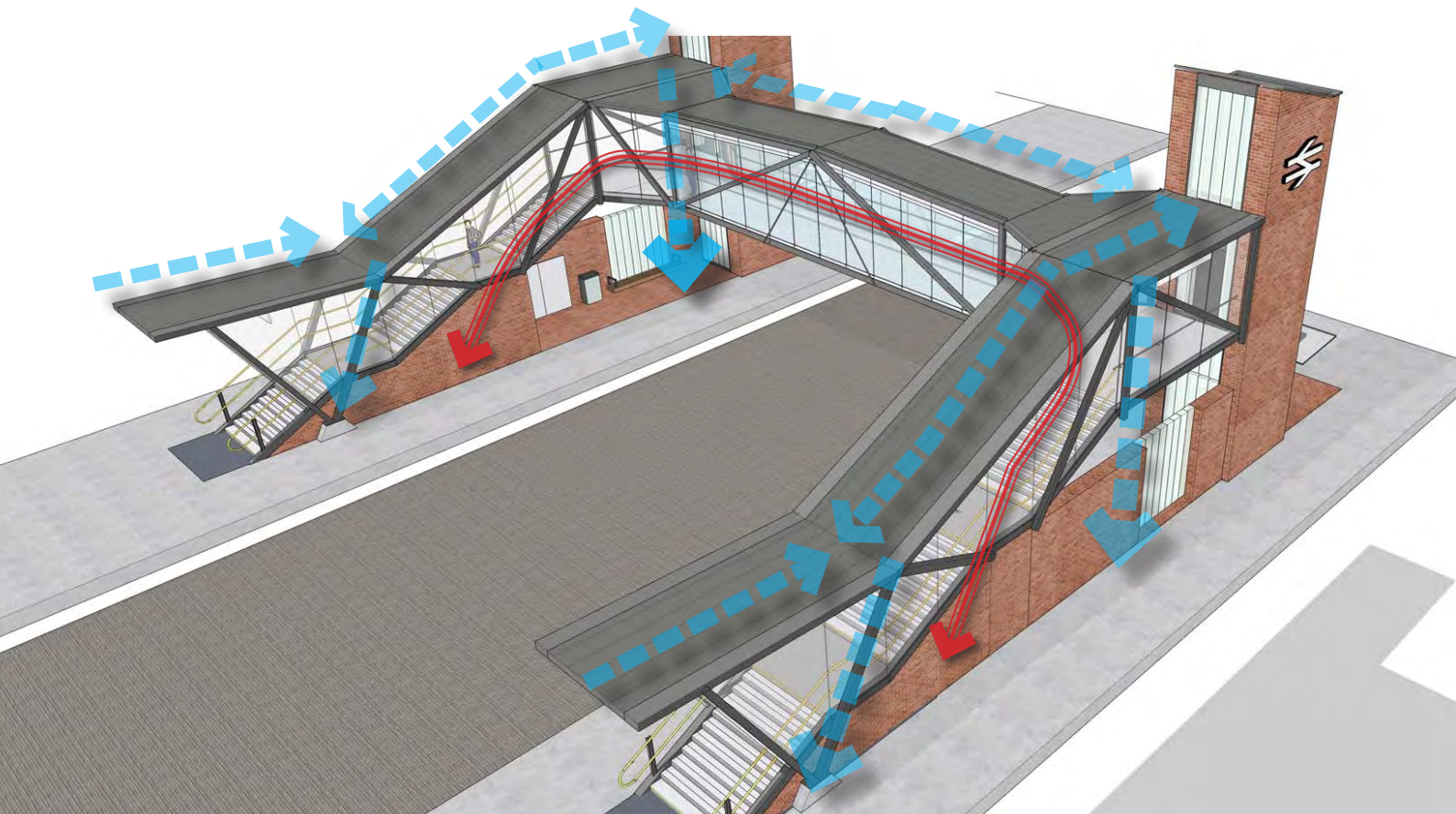
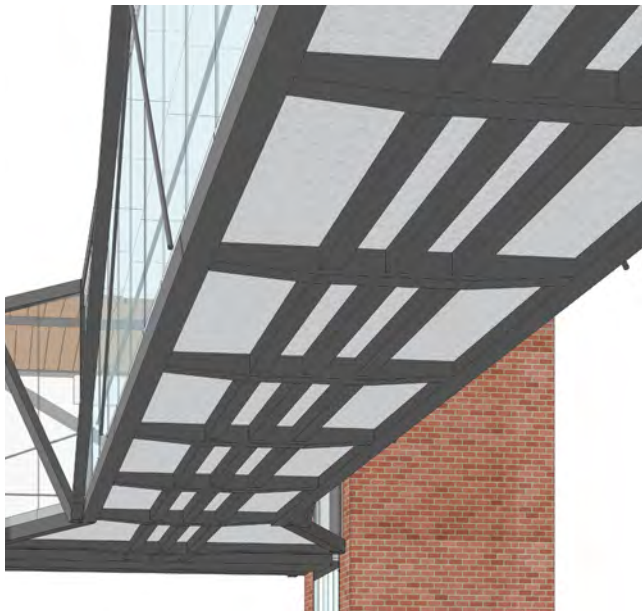
# Integrated services

## Services concealed with structural elements

The location of service runs has been designed in parallel with the structural design to provide concealed service routes. Three hollow steel members on the underside of the deck provide space for cable runs across the bridge.

Rainwater pipes are concealed within the lift shaft, and underneath the diagonal steel member at the stair entrance.

Refer to drawings for further details of service integration.





# Ewell West Station - Proposed



Facing North



# Ewell West Station - Proposed



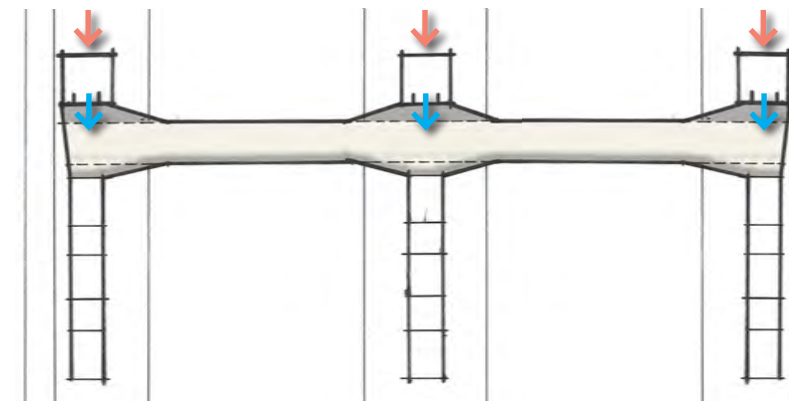
Facing South



# Variations

- Four platform station
- Alternative directions
- Open bridge

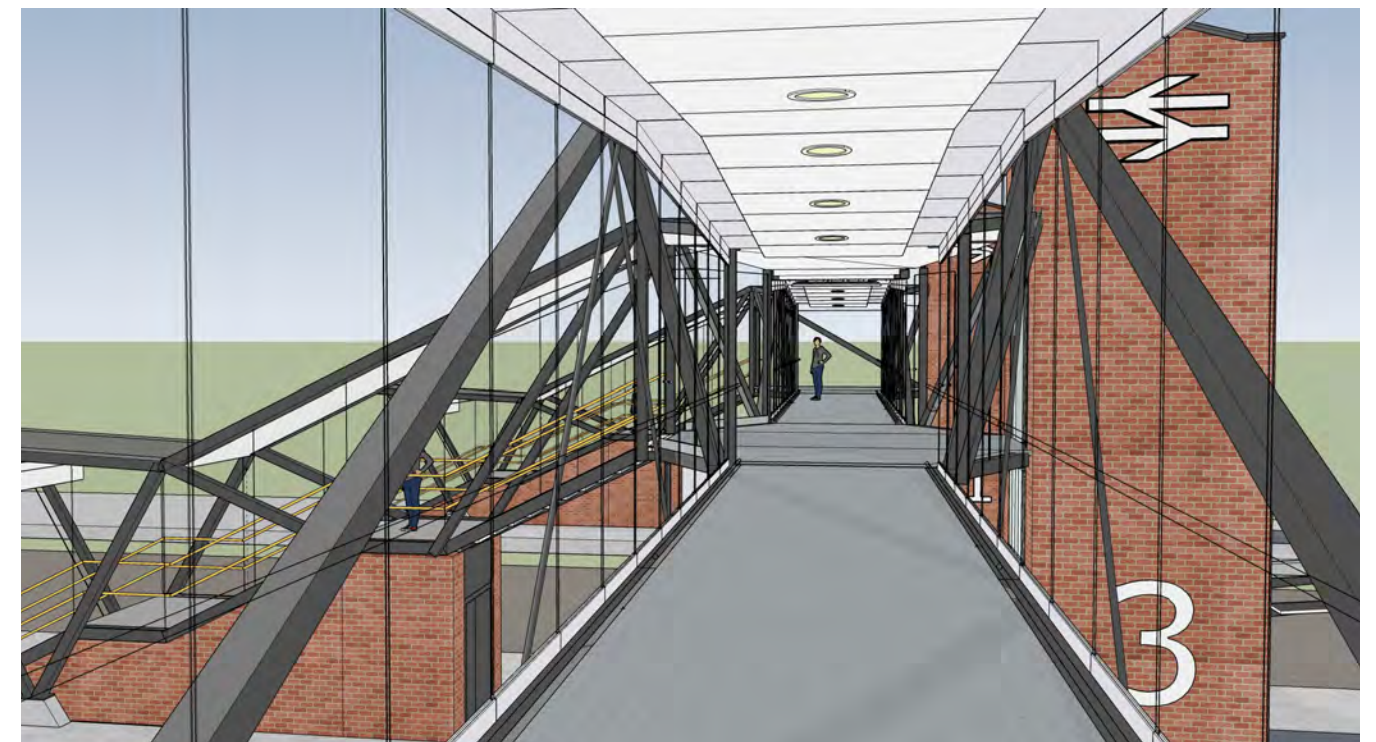
# Multiple platforms



## Adaptable to multiple platform stations

The bridge has been designed as a 'kit of parts' of stair, lift, and deck pieces. The configuration of these can be adjusted so that the bridge can be extended across further platforms, or to have direct access from a station building at high level.

The adaptability of the bridge means that an assessment of particular station needs may result in different configurations of components.



Interior deck view

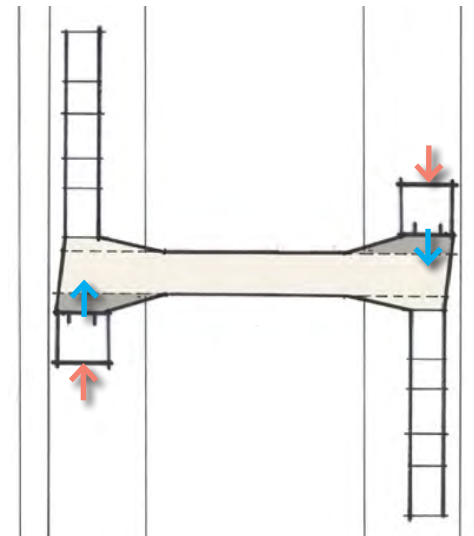


# Multiple platforms





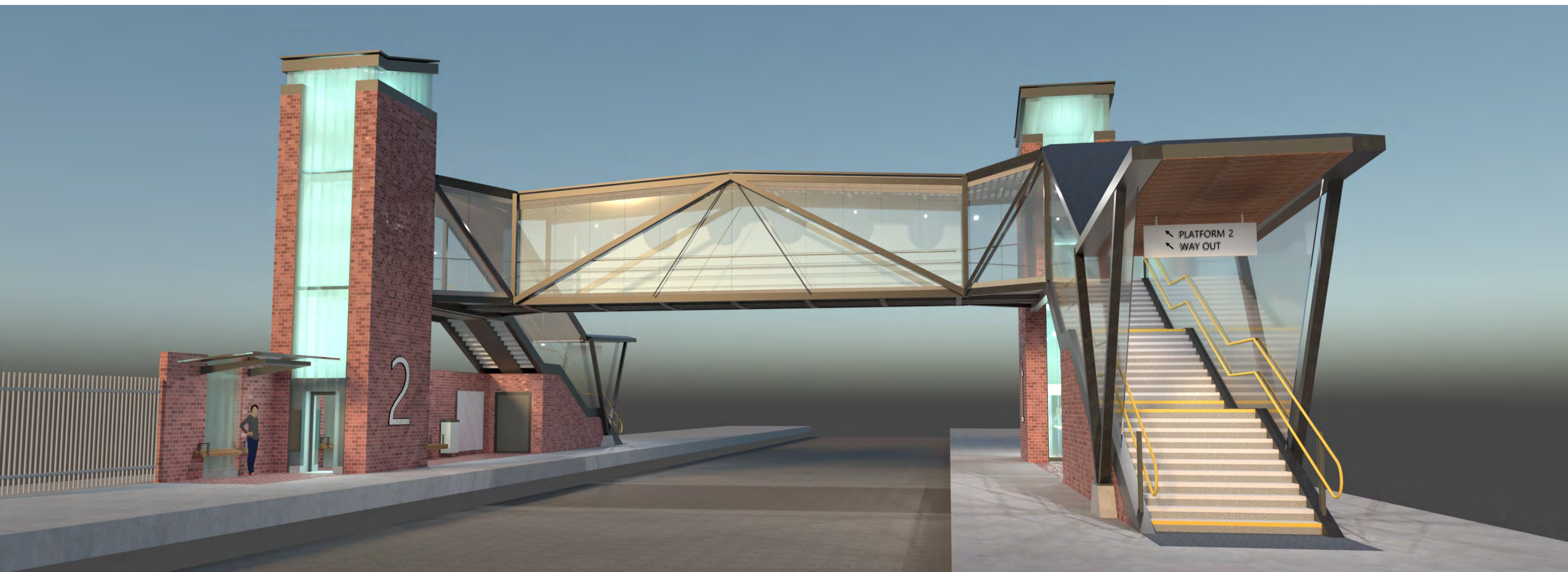
# Alternative directions



## Directional variation

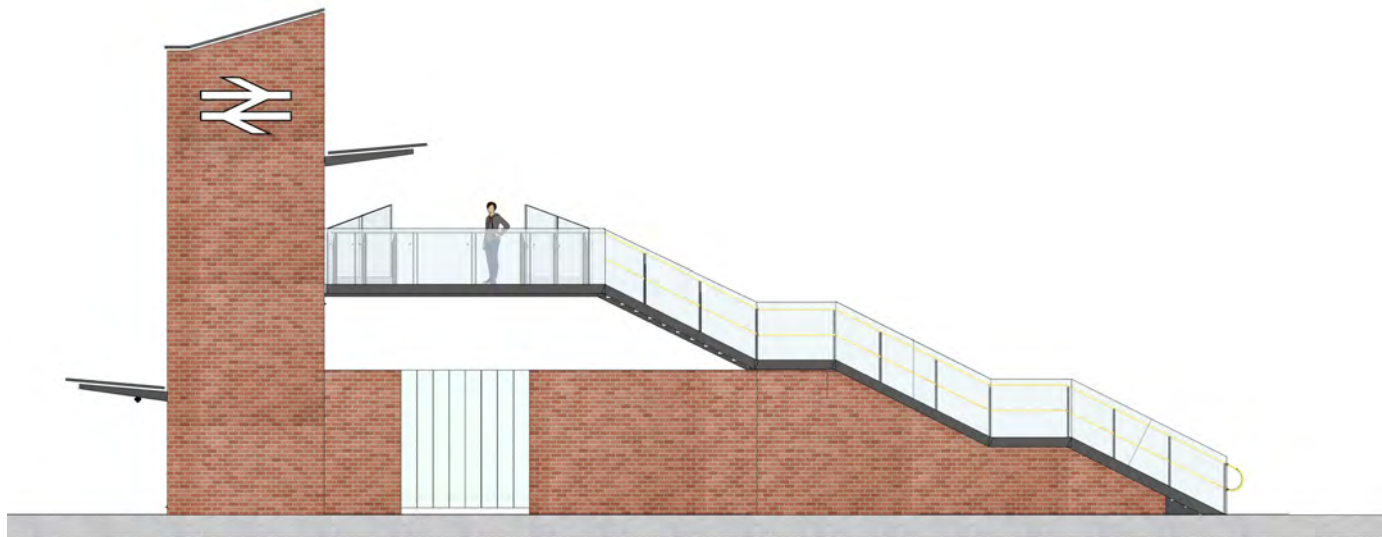
The direction of the stair and lift can be reversed if required, and stairs on one platform do not have to match the direction of the other. This may be desirable in certain station environments where there are station entrances in different locations on each platform.

An assessment of the entrances and exits, and the predominant direction of travel at the station will determine the best configuration of direction for the bridge.





# Open Bridge



Elevation, External side

## Uncovered bridge

Whilst it is desirable in many instances to provide cover to the footbridge, there are certain situations where a bridge may need to be uncovered. The bridge design can be accommodated to suit this with a few changes. The materials and language of the bridge are consistent across both bridges,

which form a coherent family within the bridge 'kit of parts'.

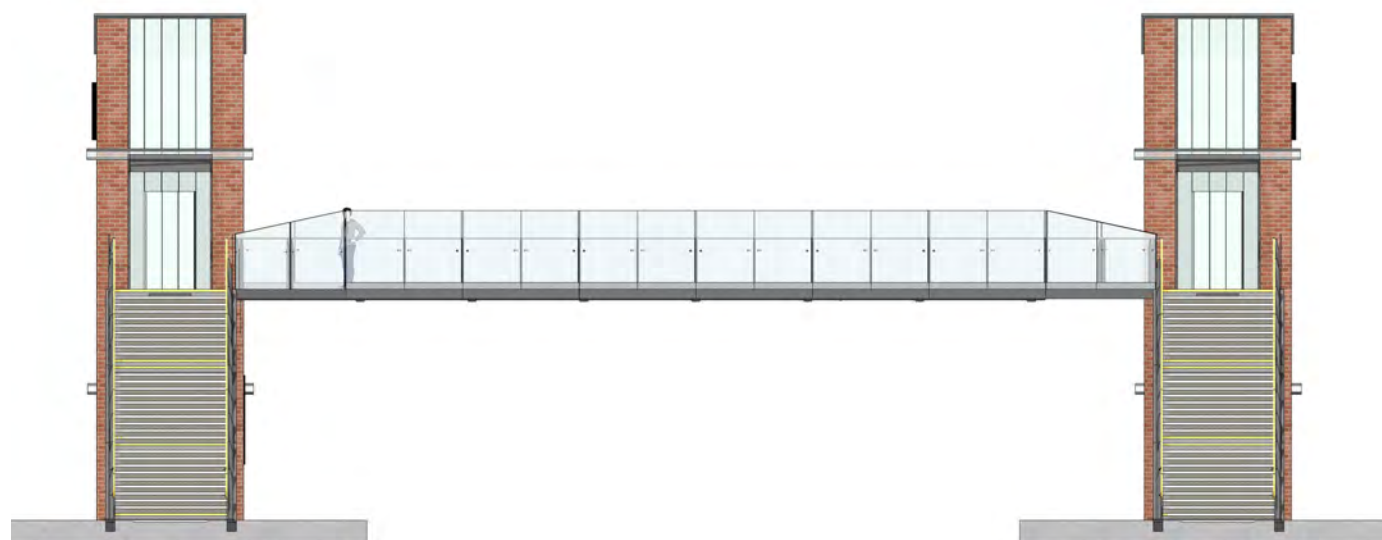
Lift and stair structures remain constant in both the covered and uncovered bridges, but the deck structure is designed a simple beam bridge rather than a truss. However, due to reduced profile of the roofless deck, the height of the lift towers have been

lowered by 1.5m.

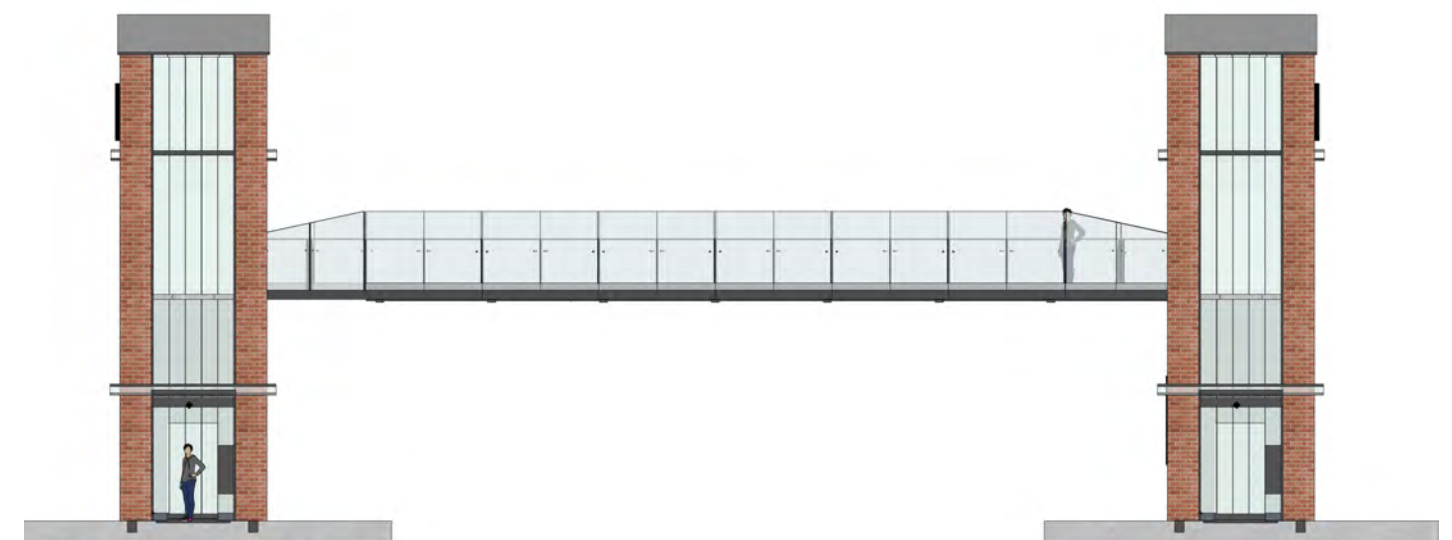
Glazed balustrades are provided at 1200mm high to the stairs, rising to w over the tracks. Cantilevered vertical support posts restrain the glazing as it cannot be restrained by a roof structure. Lighting within the posts provides a uniform light level to the deck.



Elevation, Platform side



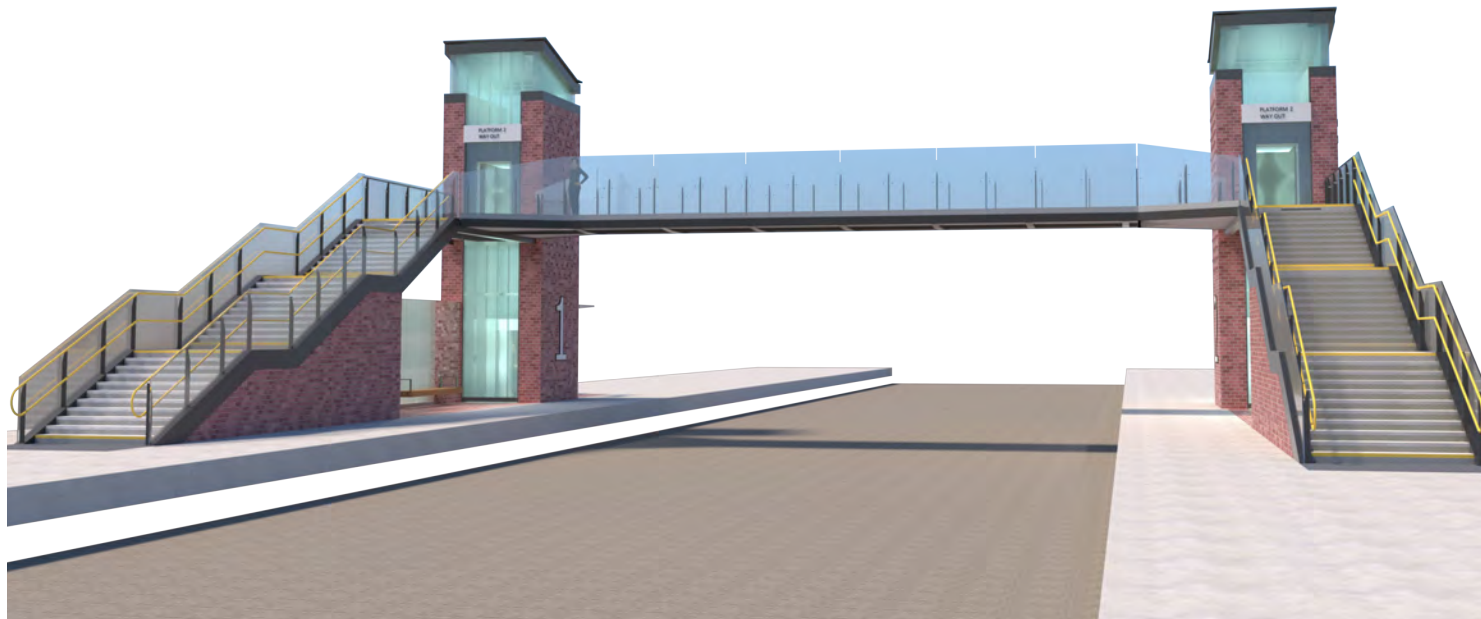
Elevation, Front



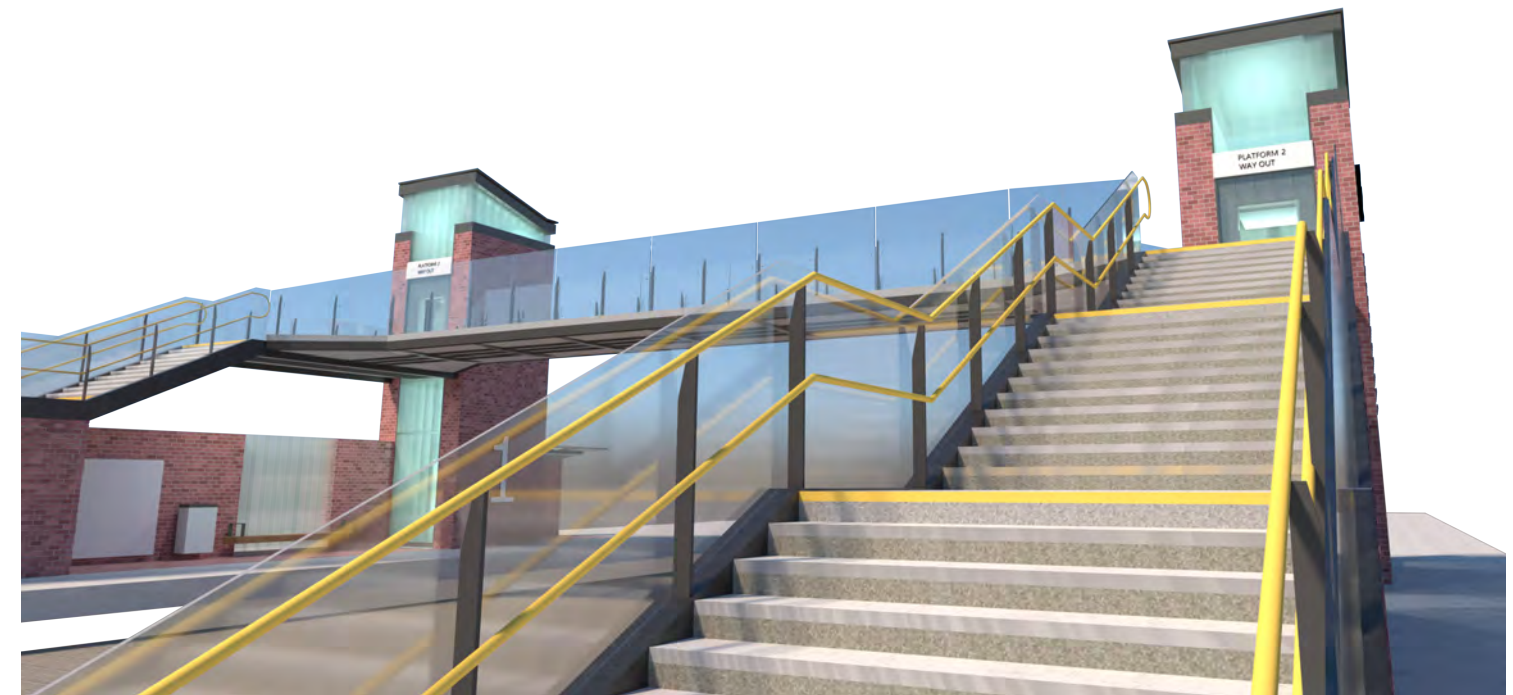
Elevation, Rear



# Open Bridge



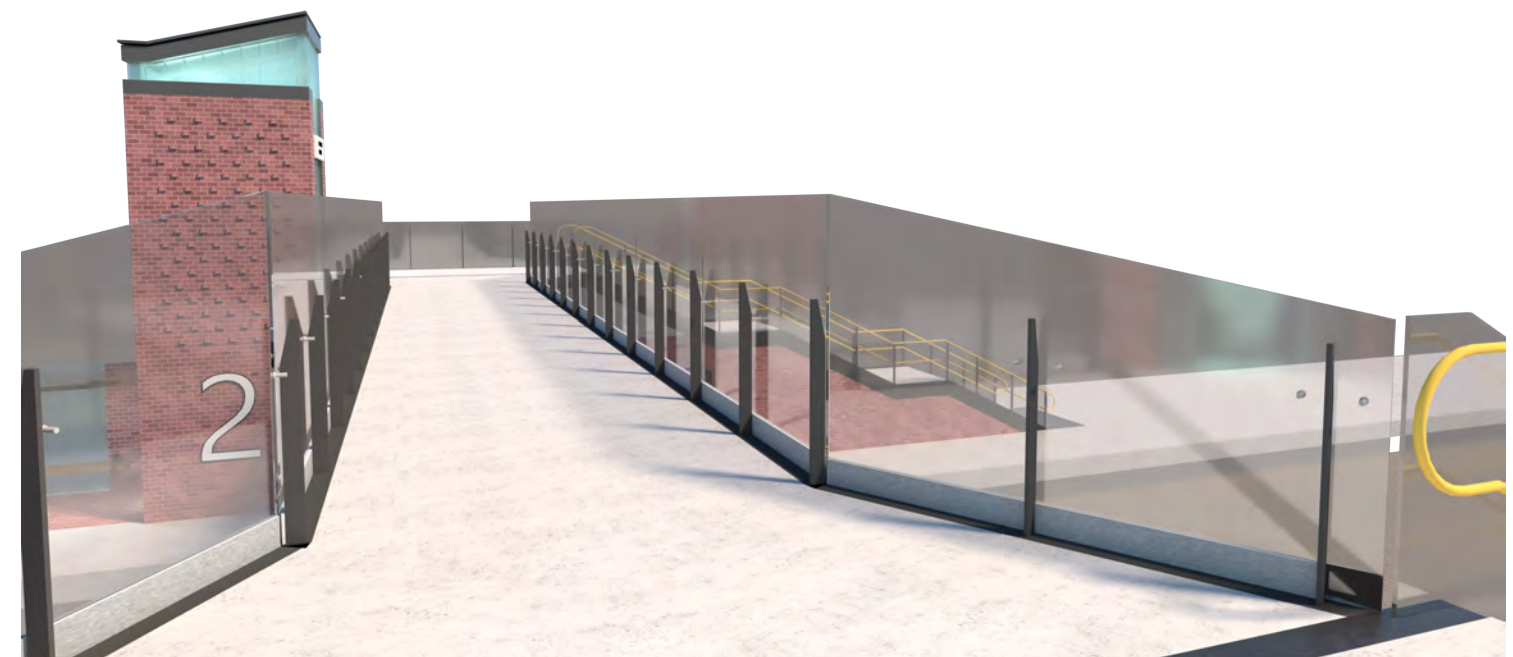
3D View, Front



3D View, Stairs



3D View, Rear



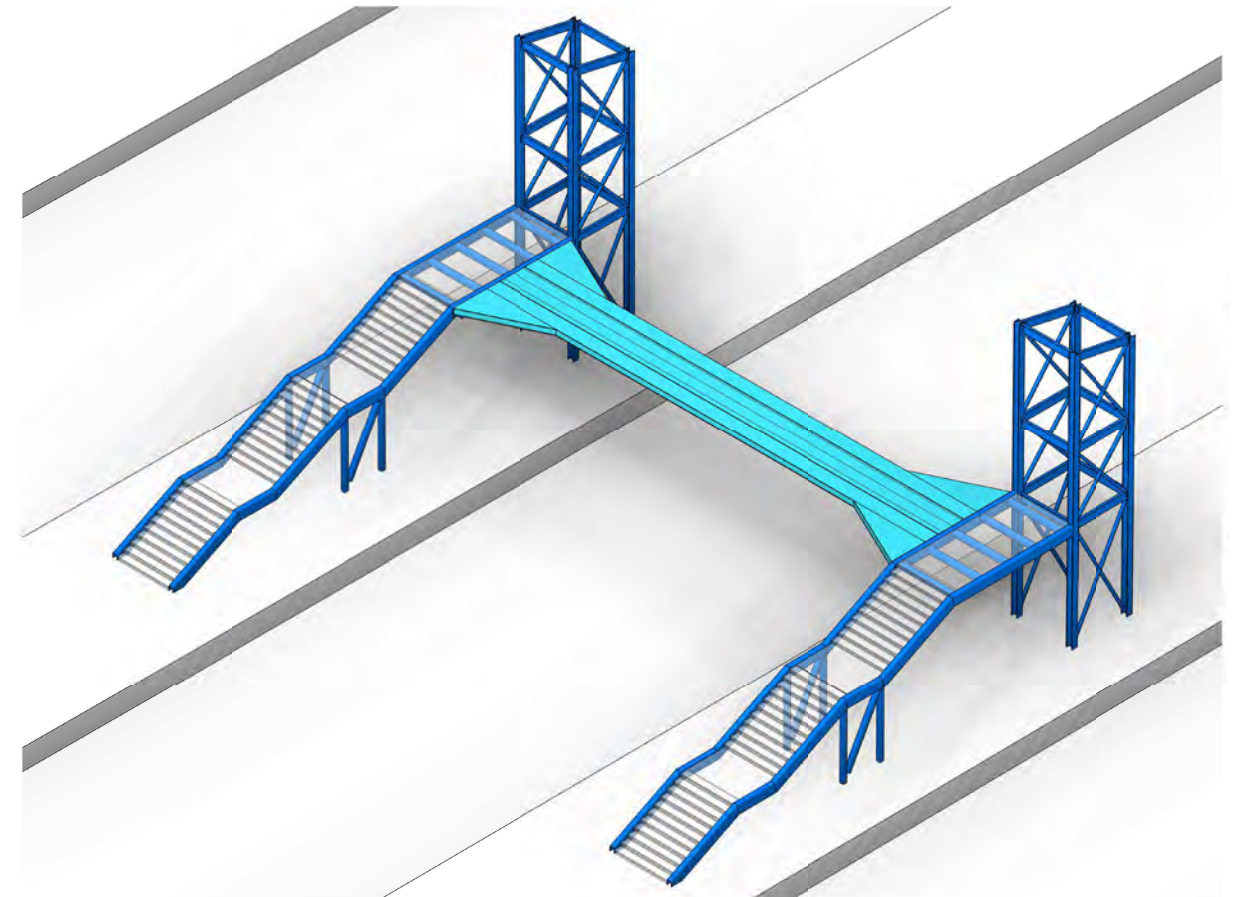
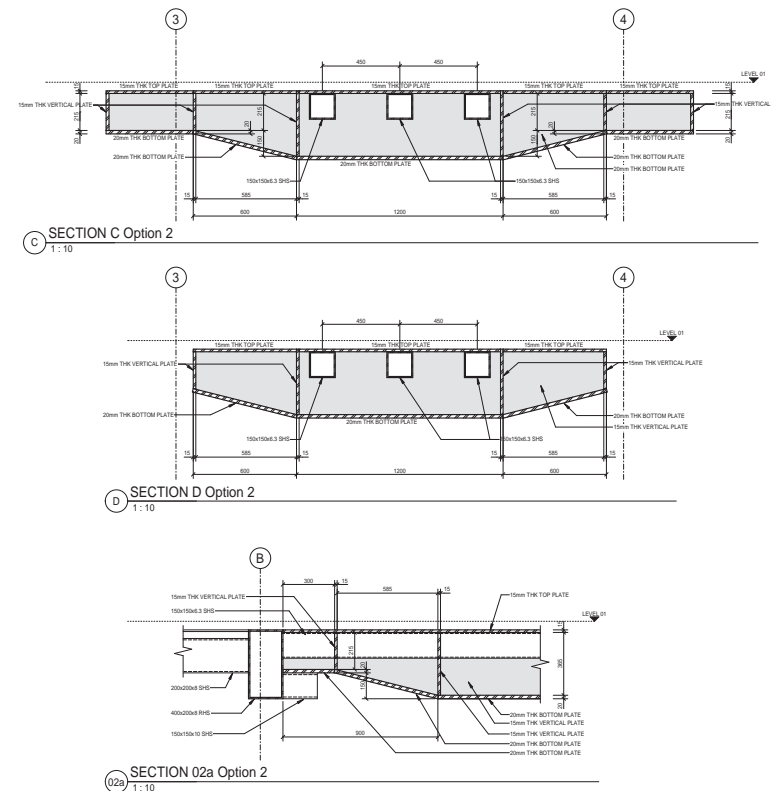
3D View, Deck



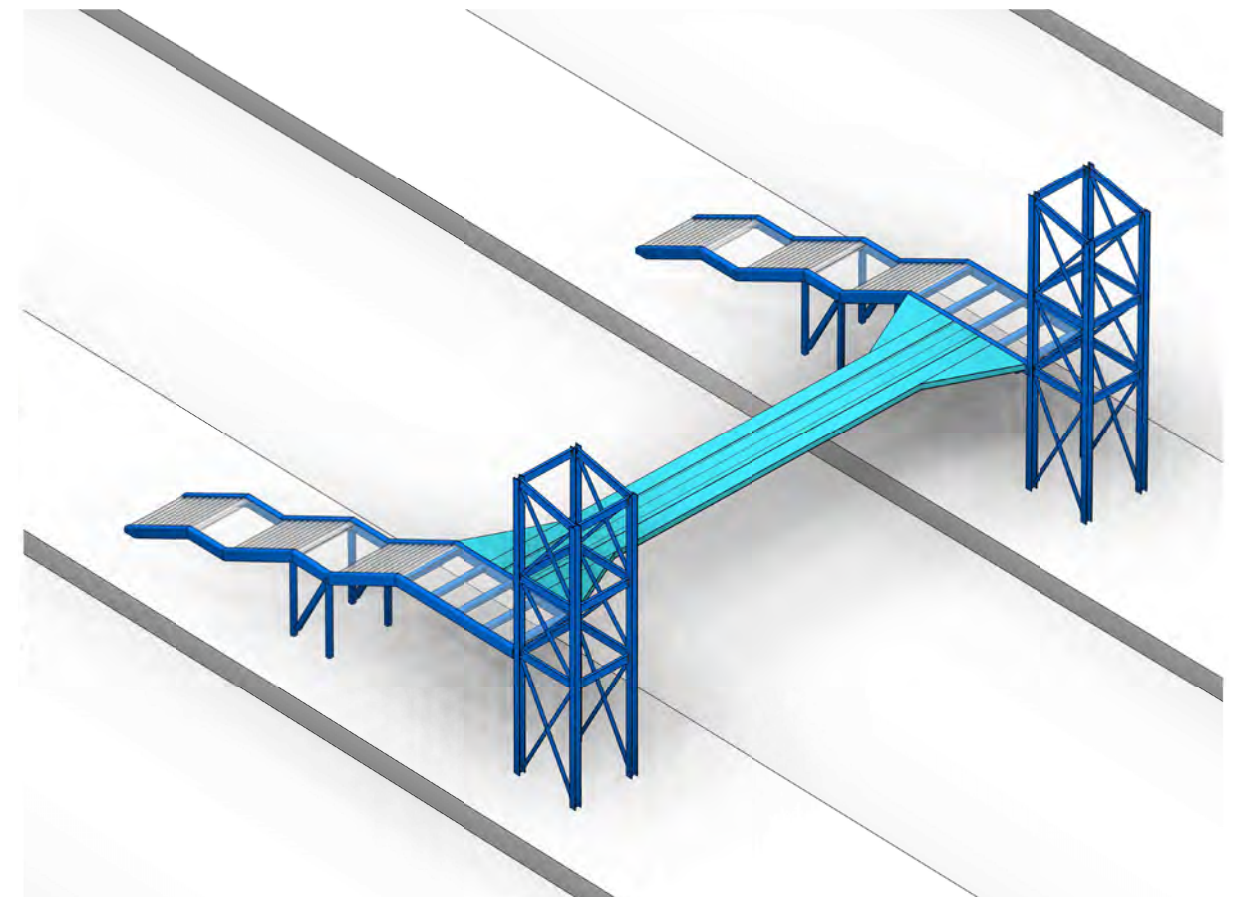
# Structure

## Structural approach

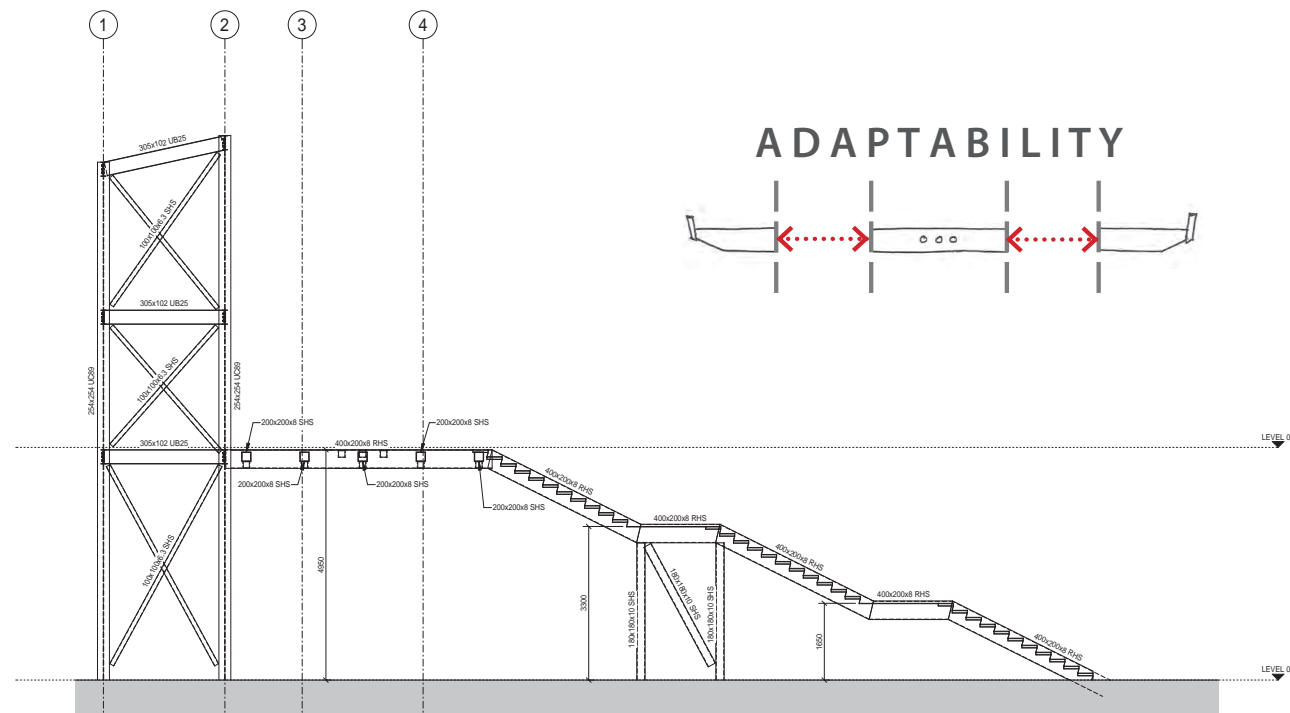
The visual intention of the bridge is to create as slender a structure as possible, emphasised with the use of glass parapets. The bridge deck is therefore a pre-fabricated sealed box-girder. To keep the depth to a minimum, 400mm, the full width of the deck is used structurally. The 2.4mm wide section, 20m long, can be pre-fabricated off-site and delivered to the site assembly yard. If transport is feasible, the splayed ends of the deck should be included as part of the pre-assembly, but if not, these can be bolted on site and sealed with a site seal weld. Ducts for services are provided within the box girder. These at their ends could be exposed to the elements so would have to be in stainless steel.



FULL 3D VIEW 01 Option 2



FULL 3D VIEW 02 Option 2







Ref: 3194/A/8500  
Revision: A01  
Date of Issue: 18th April 2019

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