

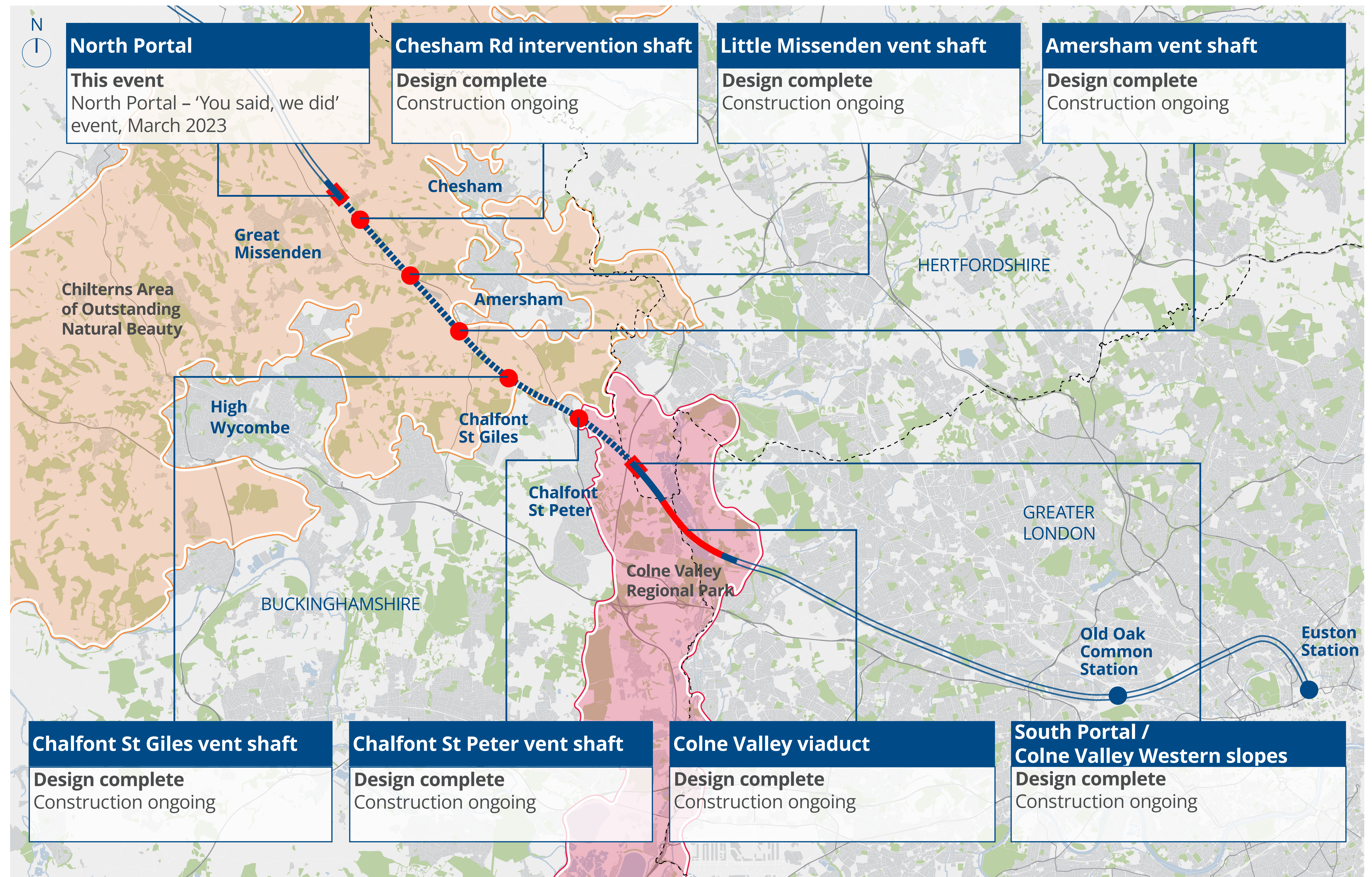
# The HS2 route in the Chilterns and the Colne Valley

High Speed Two (HS2) is the new high speed railway for Britain

## What we are doing

Align is working on behalf of HS2 Ltd to build 22 kilometres of the high speed rail line, running between the Colne Valley and under the Chilterns to South Heath near Great Missenden. It includes the 3.4km-long Colne Valley viaduct and the Chiltern Tunnel which has four ventilation (vent) shafts to regulate airflow, and one intervention shaft. These vent shafts and the portal buildings at each end of the tunnel contain electrical equipment to manage the flow of air between them.

We have held regular information events to share details on progress of designs for the shaft buildings which are above ground. At these events we have sought views on those designs and responded to feedback. We are now at end of this process and are presenting our final designs for the North Portal ancillary building which will house mechanical and electrical equipment to help manage the air flow in the Chiltern Tunnel.





# Introduction

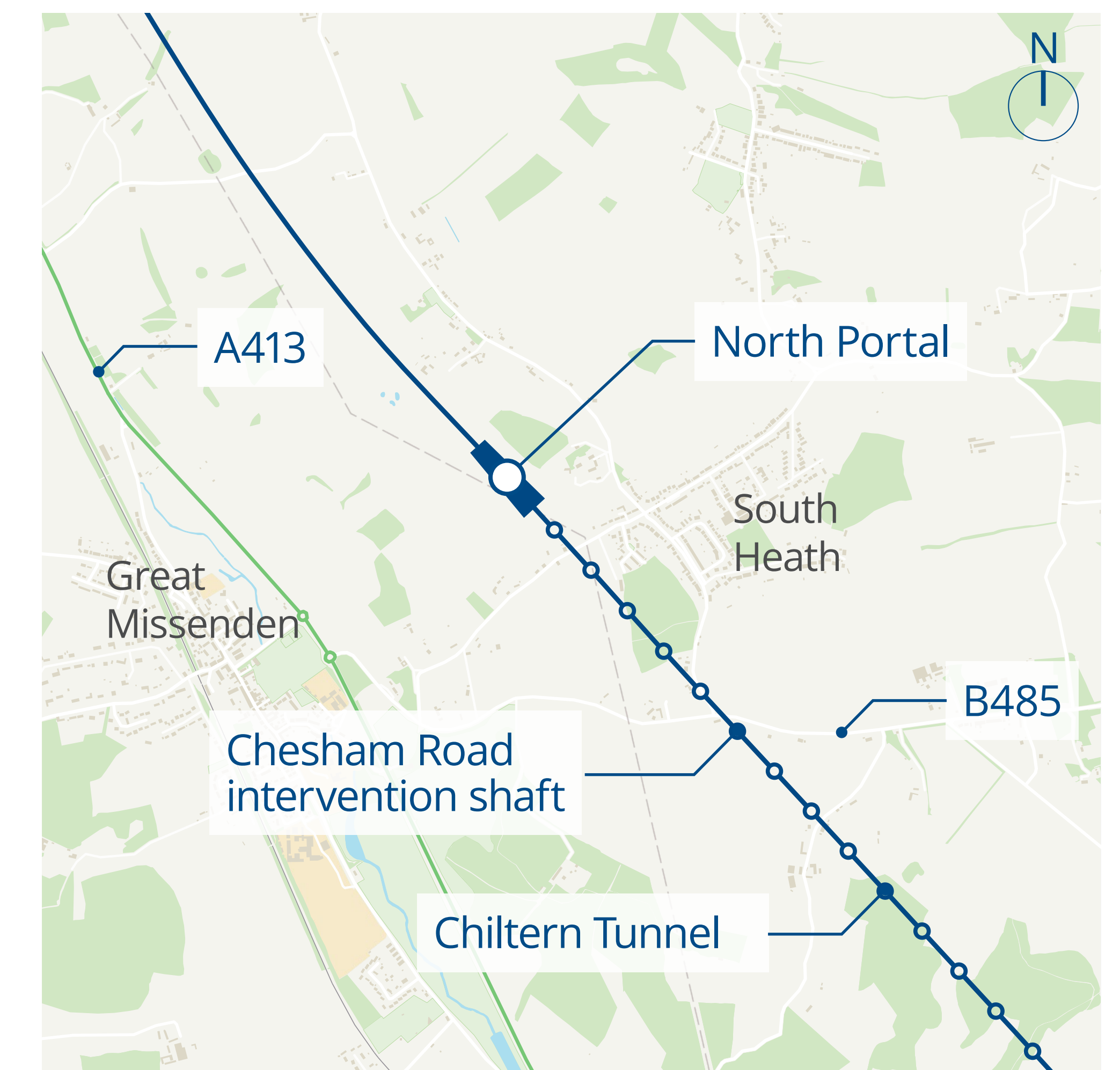
Welcome to our 'You said, we did' event for the North Portal ancillary building and porous portal

The information in this exhibition is to show you the final design for the North Portal ancillary building near South Heath, Buckinghamshire.

We are presenting:

- Our final design that we shall be submitting to Buckinghamshire Council
- Information on the construction timeline
- Images of EKFB's landscaping proposals for this area
- How feedback from the previous event has shaped this design.

## HS2 route through the Chilterns



The North Portal is located near South Heath, Great Missenden, Buckinghamshire. The site sits between Frith Hill to the south east and Potter Row to the north east.

The nearest main villages include Great Missenden, Little Missenden, The Lee and Prestwood. The site is where Align meets another main works contractor, EKFB. Here the train line exits the tunnel and continues north towards Birmingham.

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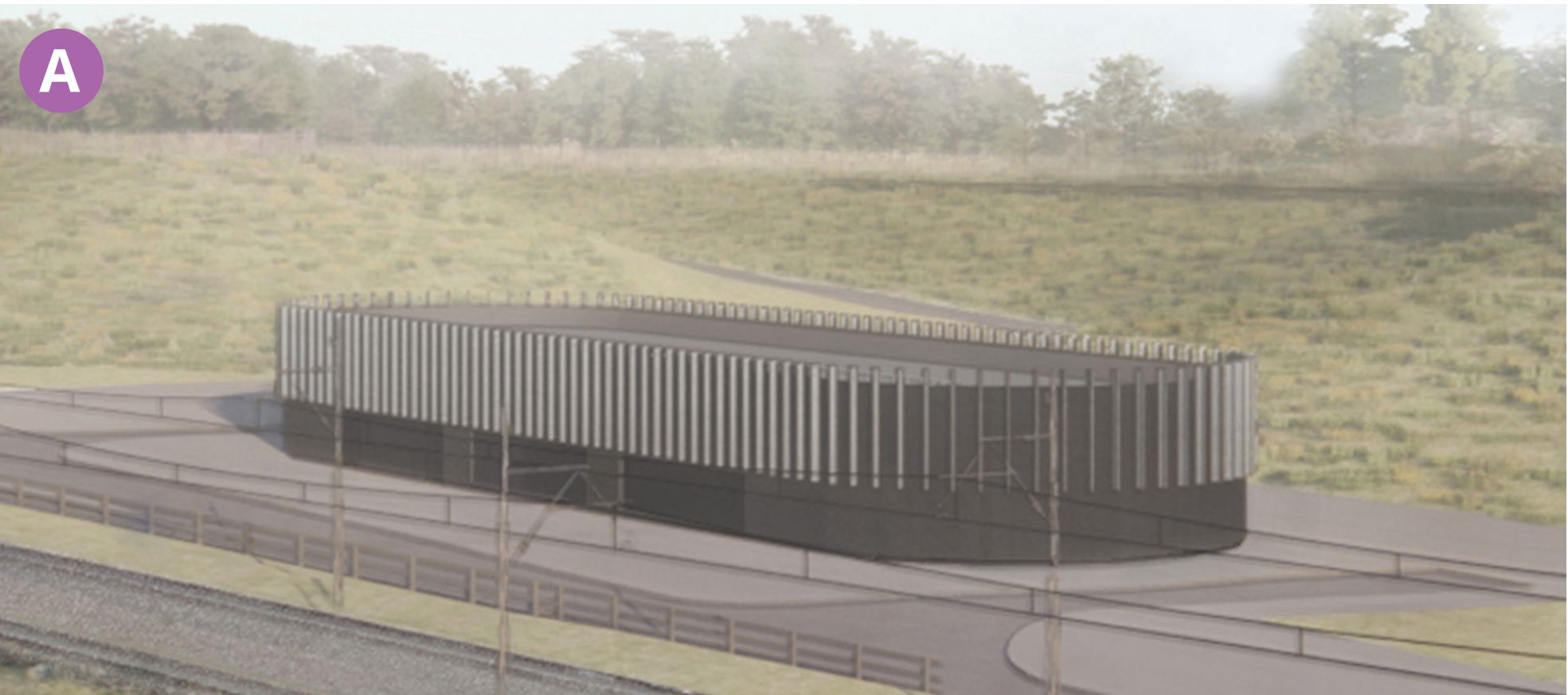


# Public feedback

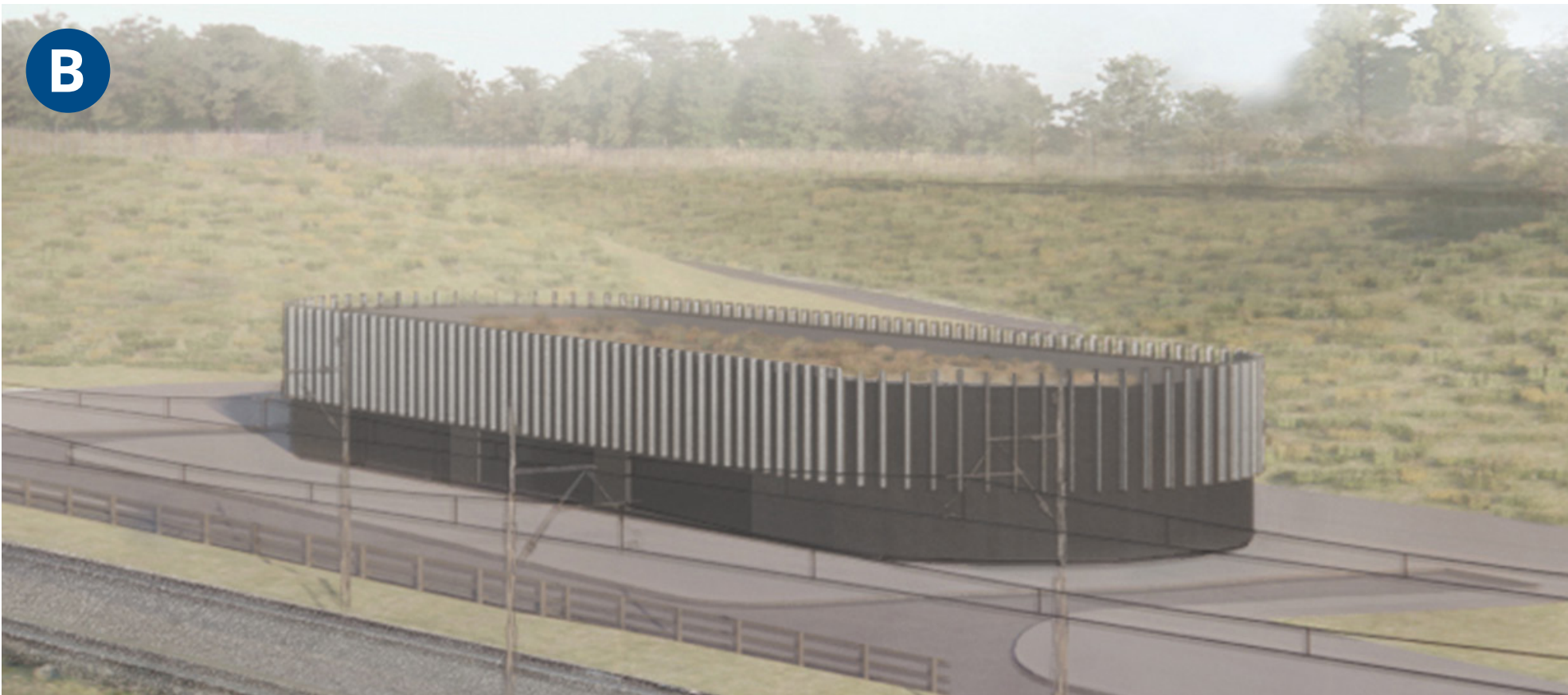
At our early stage design events we asked you to rank our four design proposals in order of priority and provide feedback in free text boxes. Your responses have been considered in the final design

## Design proposals for North Portal ancillary building

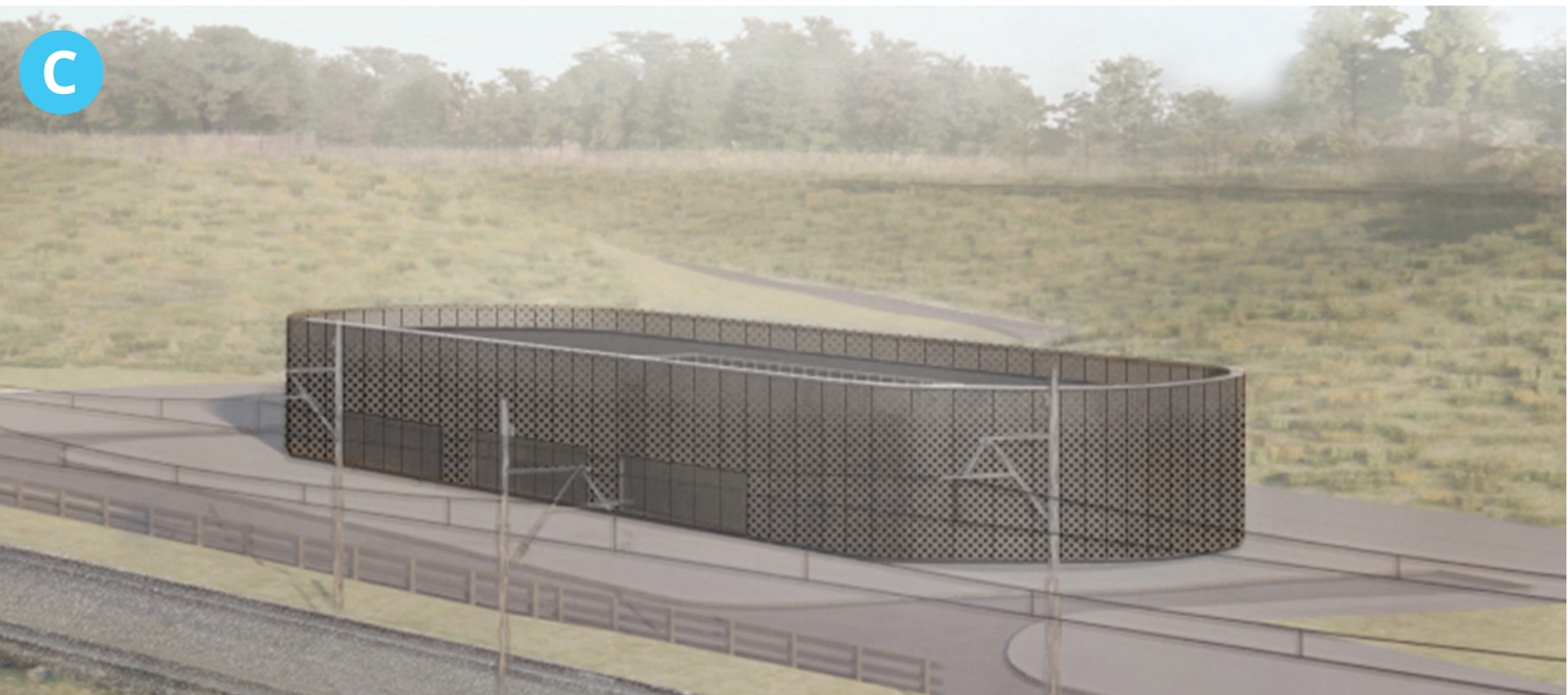
We presented the four design options for the material finish and structure of the North Portal ancillary building and asked participants to rank them in order of preference. 51 responses were received with a preference for Design Option D demonstrated. There was a clear preference for a design which incorporates a green roof.



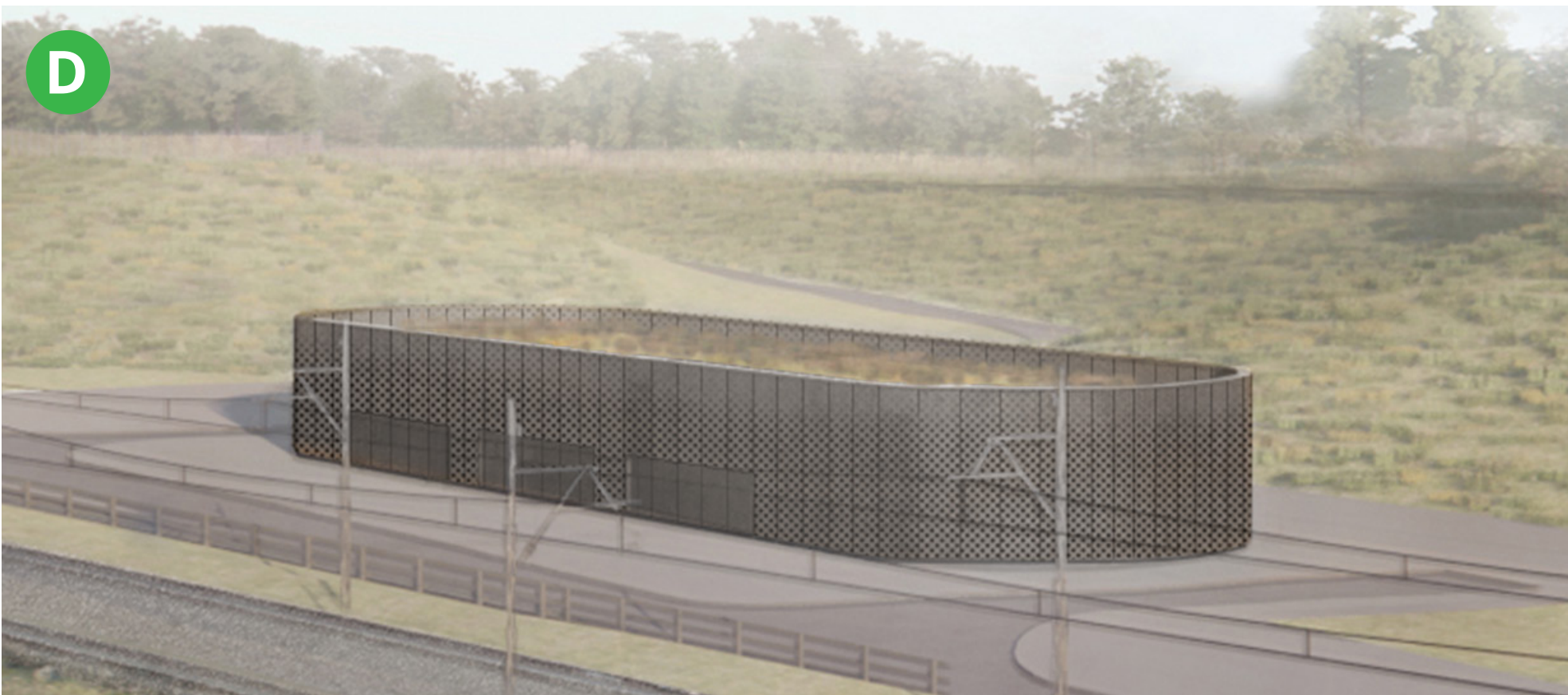
Option A: Split louvred façade; dark anthracite grey; flat top roof



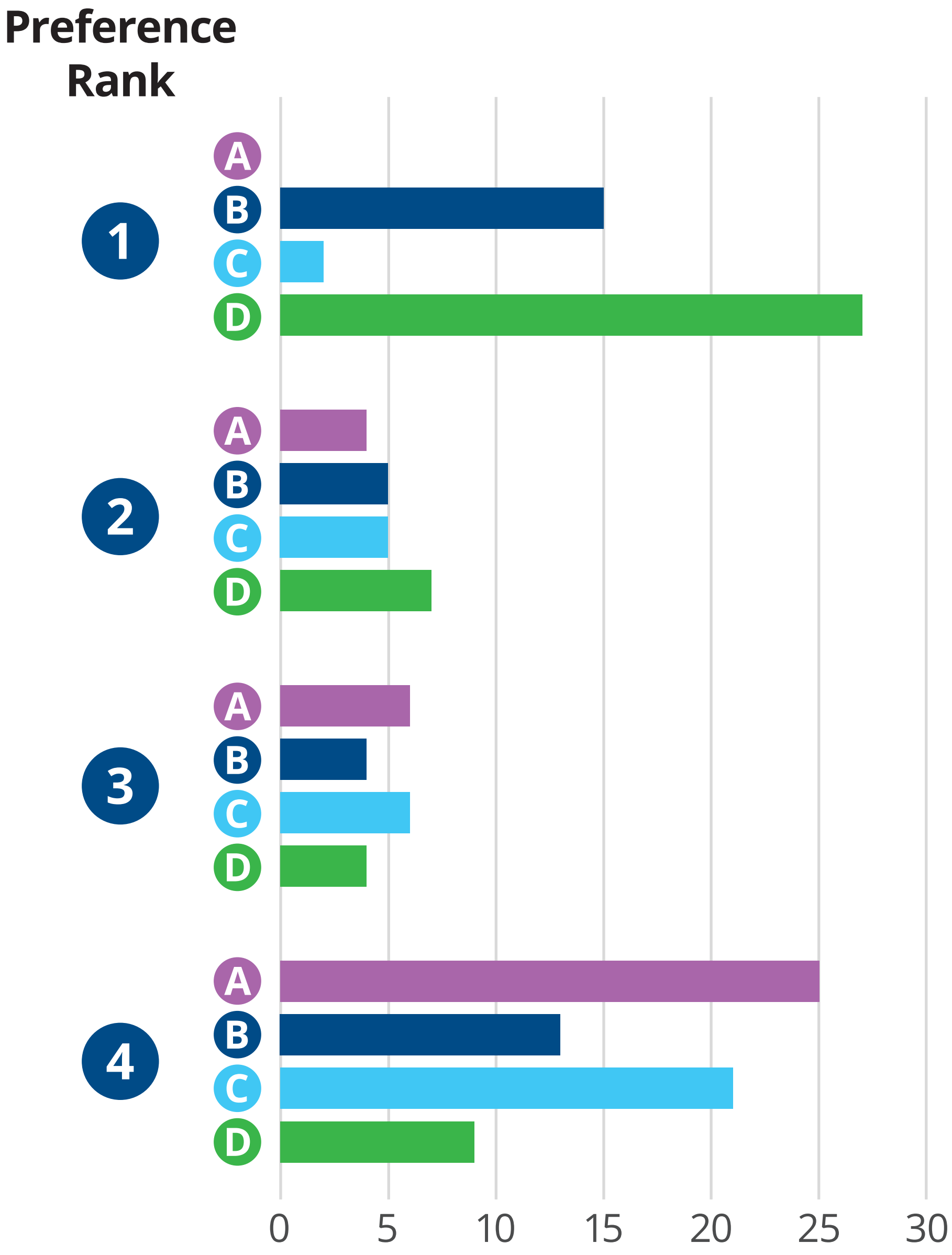
Option B: Split louvred façade; dark anthracite grey; non-intensive green roof



Option C: Anodised aluminium with perforated façade; dark anthracite grey; flat top roof



Option D: Anodised aluminium with perforated façade; dark anthracite grey; non-intensive green roof



## Comments on the design proposals

We also asked for comments on the designs presented for the porous portal and the ancillary building to allow further consideration to be given to residents' concerns and opinions in the design.

The following summary identifies the key concerns that were regularly raised, and which have been used to inform the updated design:

- There is a need to do more to make the buildings “blend in” to the existing landscape
- Materials should match the existing environment or tie in with other key structures in the area, such as the planned footbridge
- The proposed ancillary building design is “too bulky”
- Consider additional planting and screening around the site.



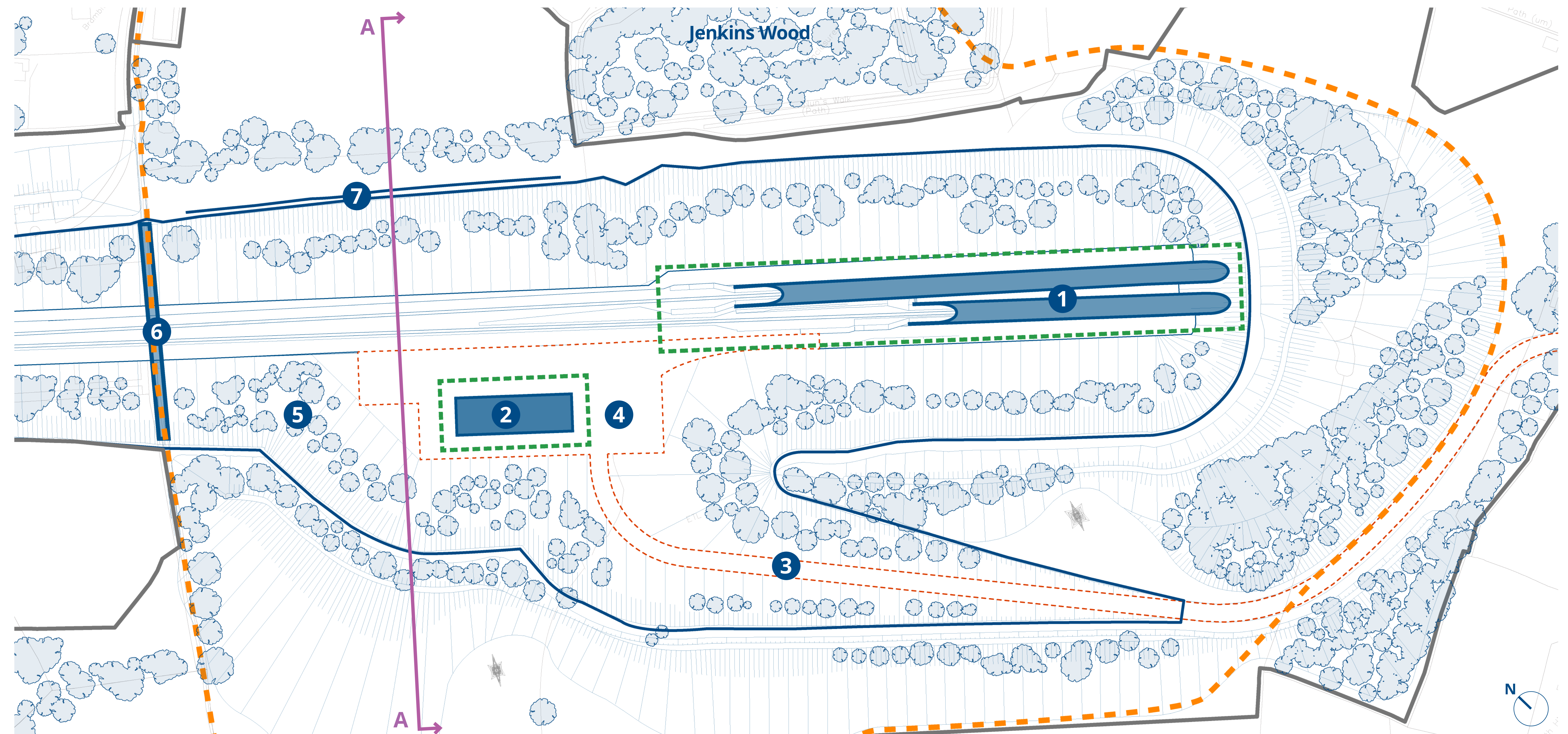
# Site proposals

## Site overview

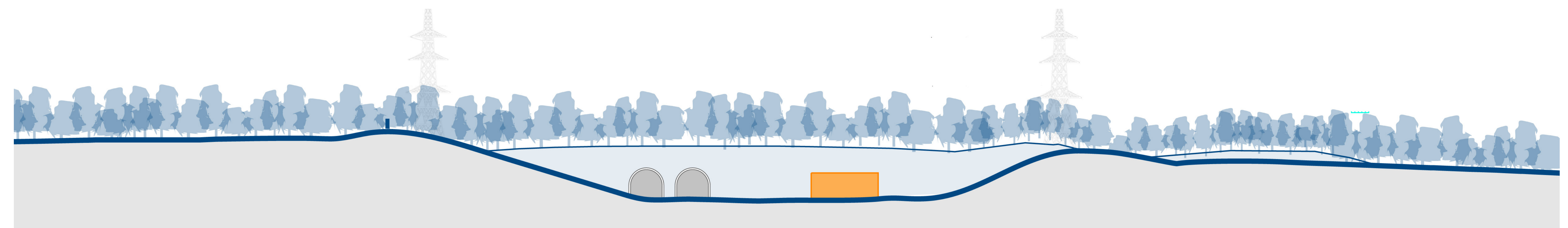
- The North Portal structure and ancillary building are important elements within the new high-speed rail line
- The portal structures consist of two tunnels which are staggered to mitigate differing air pressures created by passing trains. The entry portal is 220m and exit portal structure is 135m long
- The North Portal ancillary building is a single storey structure measuring approximately 61m in length and 21m in width. It accommodates support machinery for the railway.

### Key

- |                      |                         |
|----------------------|-------------------------|
| ① Portal structures  | ⑤ Cutting               |
| ② Ancillary building | ⑥ Footbridge            |
| ③ Access road        | ⑦ 3m tall noise barrier |
| ④ Compound           |                         |
- 
- S17 Application boundary – Porous portal and ancillary building (by Align)
  - Landscape works boundary (by EKFB)
  - Public Right of Way
  - - - Access road and compound (by Align)



Plan view – North Portal structures and ancillary building



Cross section view (A-A) towards the North Portal structures and ancillary building



# Site strategy

**You said:** "It would be nice if it could be further disguised with trees."

**We did:**

**Integrate the structures and building into the landscape**

- Key
- 1

2

3

4

5

6

7

8

9

1 Porous portal

Ancillary building

Access road

Compound

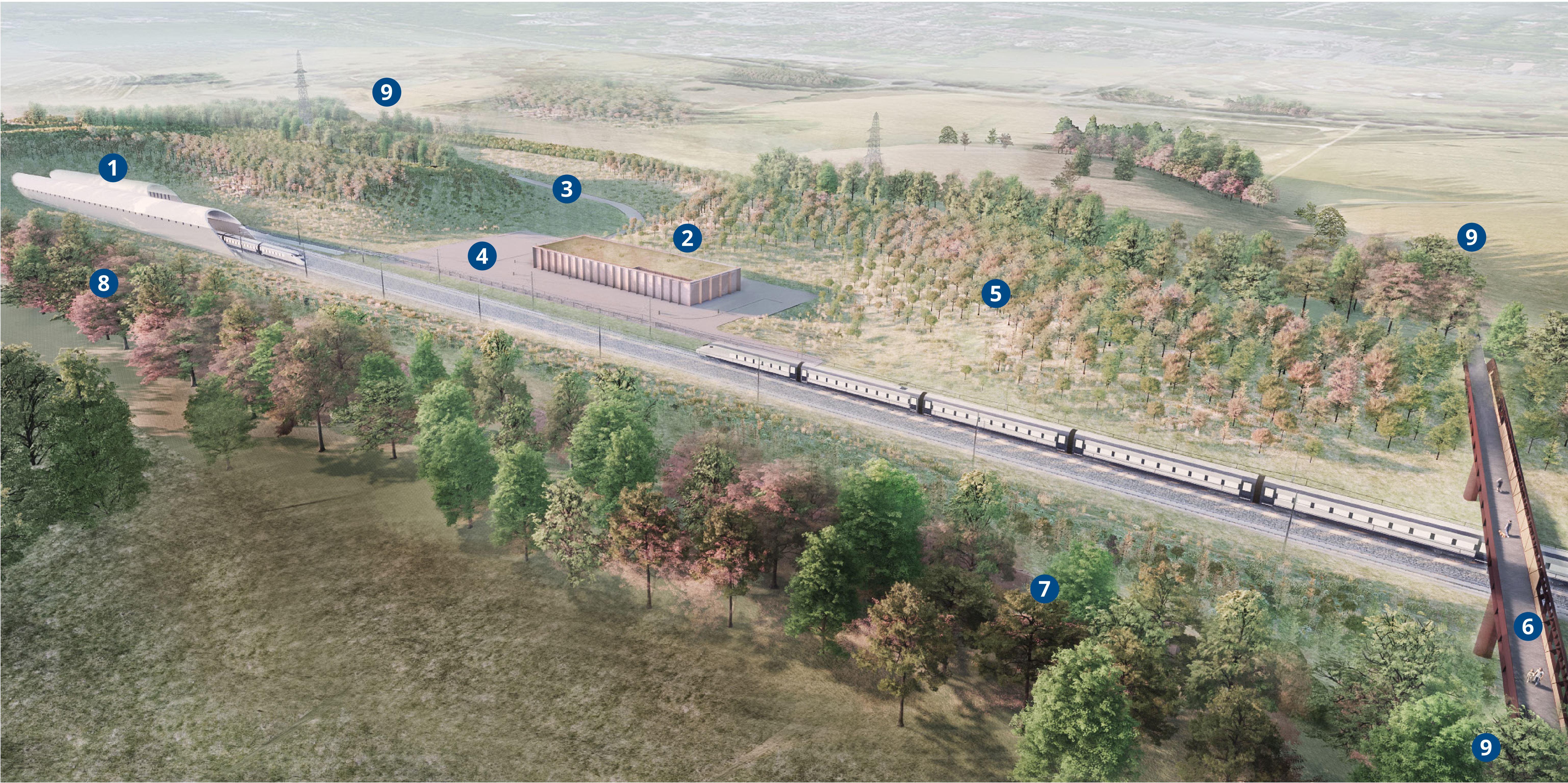
Cutting

Footbridge

3m tall noise barrier

Ancient woodland

Landscape screening



Visualisation – Aerial view showing integration of structures within landscape (Year 15)

The porous portal, ancillary building and GMI/12 footbridge sit within the railway cutting. The edges of the cutting blend into the Area of Outstanding Natural Beauty (AONB) by incorporating site specific vegetation, sculpted earthworks, ecological corridors, and re-established Public Rights of Way.

The porous portal and ancillary building have been carefully considered in line with the surrounding landscape. Particular focus has been given to the views from key points, and use of materials with colours that respond to the local environment.



# Portal structure requirements

## Functional requirements

- Provide air pressure and noise relief from trains entering and leaving the tunnels
- Act as an intervention access point for the emergency services to respond to incidents within the Chiltern Tunnel
- Provide support to the ground at the transition from open-cut to tunnelled excavation.

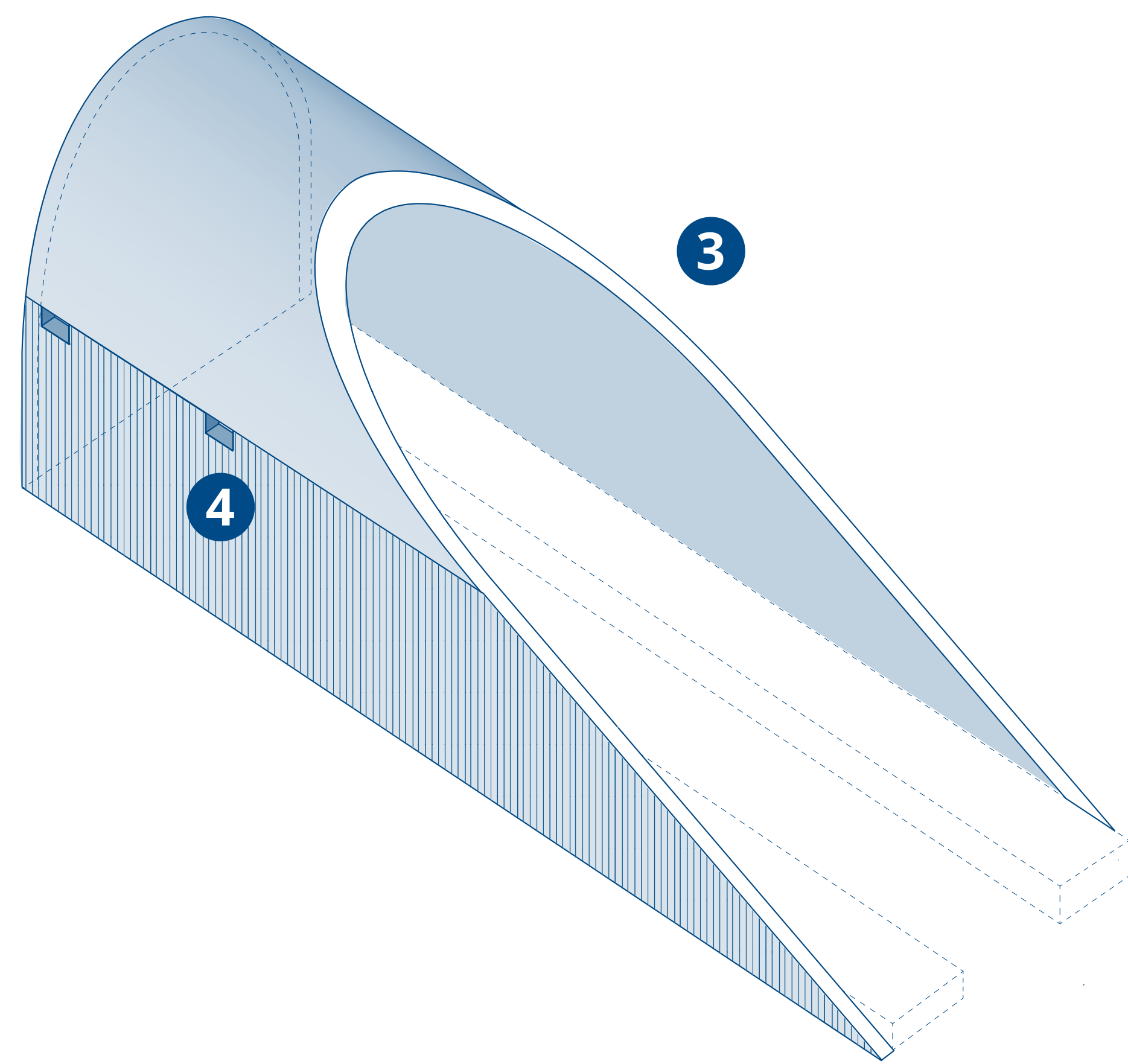
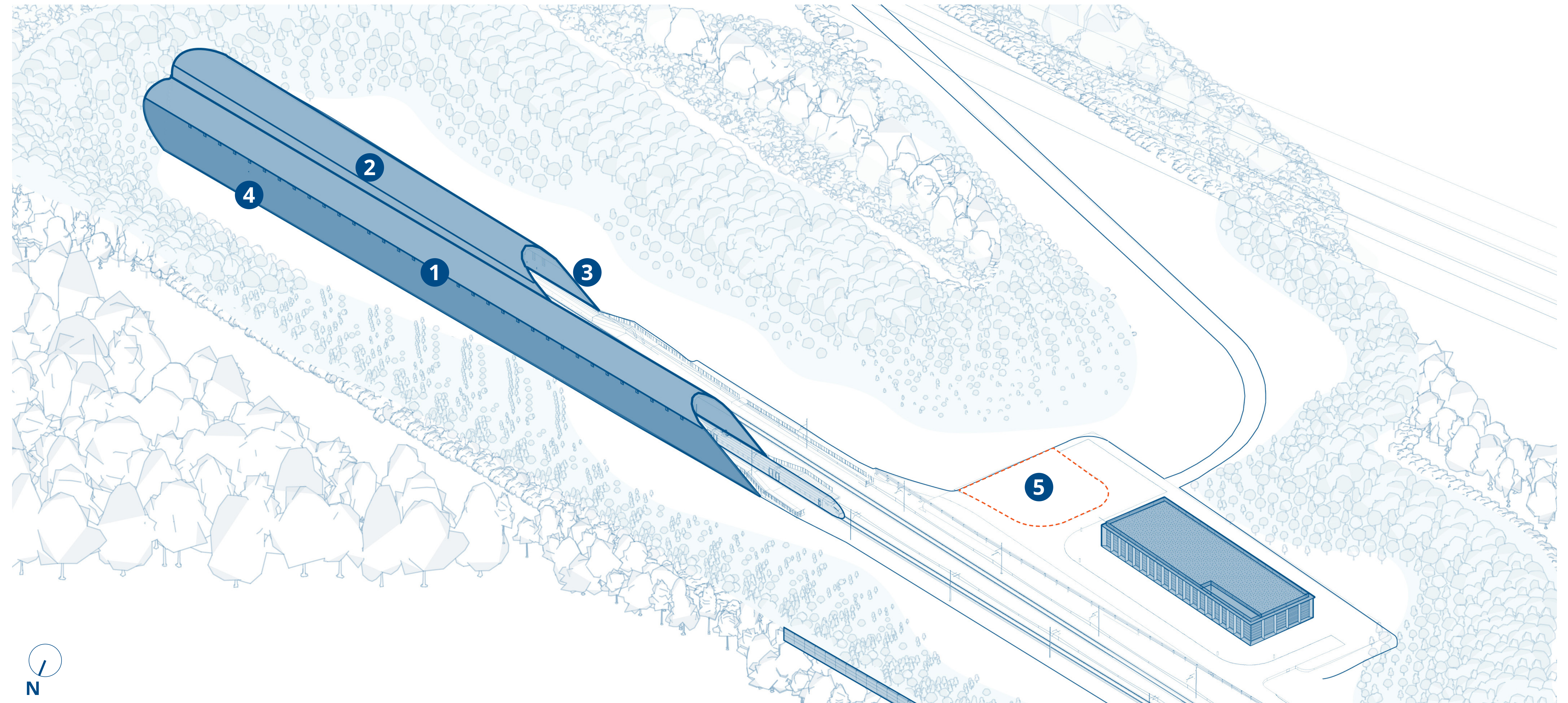


Diagram – Portal entrance profile

## Portal design



3D view – North Portal structure

### Key

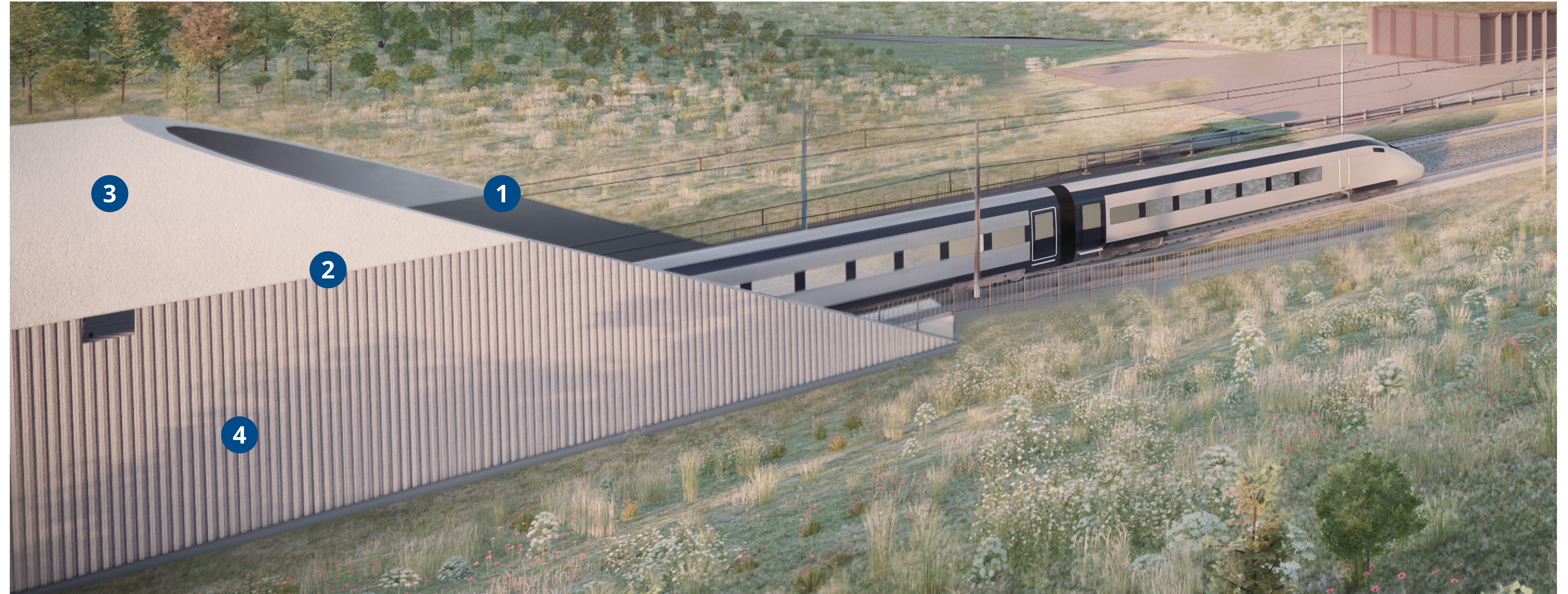
- 1 220m long entry portal enables air to dissipate gradually
- 2 135m long exit portal is shorter due to the different exit forces
- 3 The rounded portal hood helps dissipate reflected pressure into the air
- 4 Perforations need to be on the outside face of the portals to dissipate pressure
- 5 Intervention access point for emergency services



# Portal structure design

## Portal material

- The portal structures are articulated with smooth and textured concrete
- Adding texture to the concrete at low level will reduce staining from weathering and on-going maintenance
- Vertical ridges with textured horizontal finish establishes reflects the appearance of the compound building.



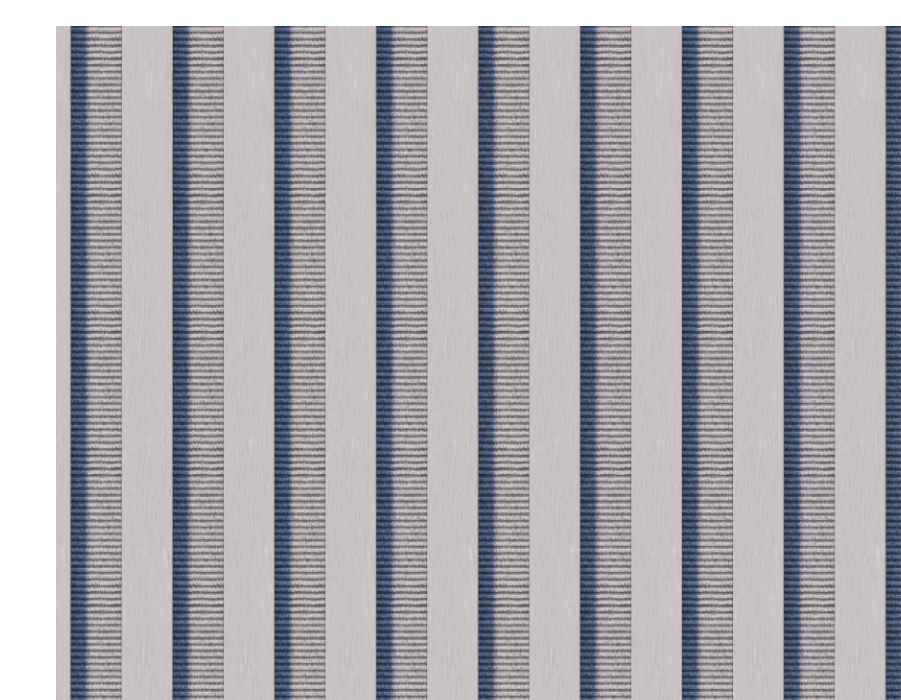
Visualisation – Portal structures (Year 15)

## Key

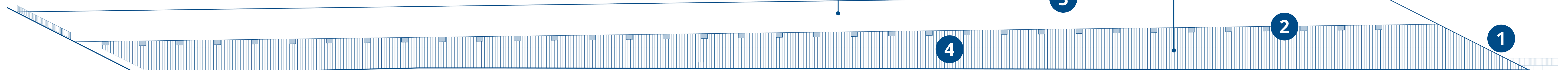
- |  |                                     |
|--|-------------------------------------|
| 1 Chamfered edge profile to vent openings            | 3 Smooth concrete to portal hood    |
| 2 Step detail between smooth roof and textured walls | 4 Textured concrete to portal walls |



Smooth concrete



Textured concrete



Side elevation – Entrance portal

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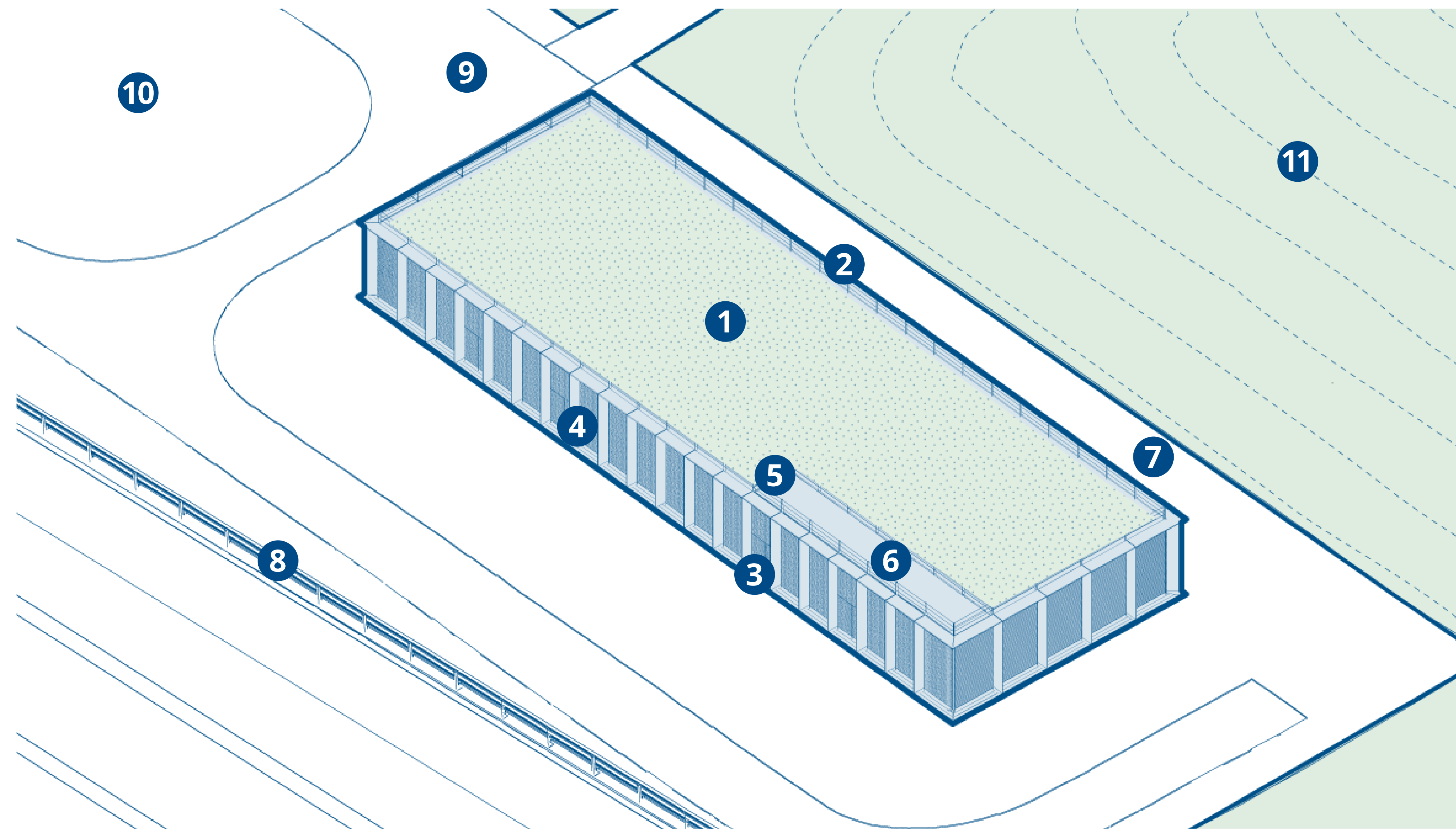
# Ancillary building function

## Functional requirements

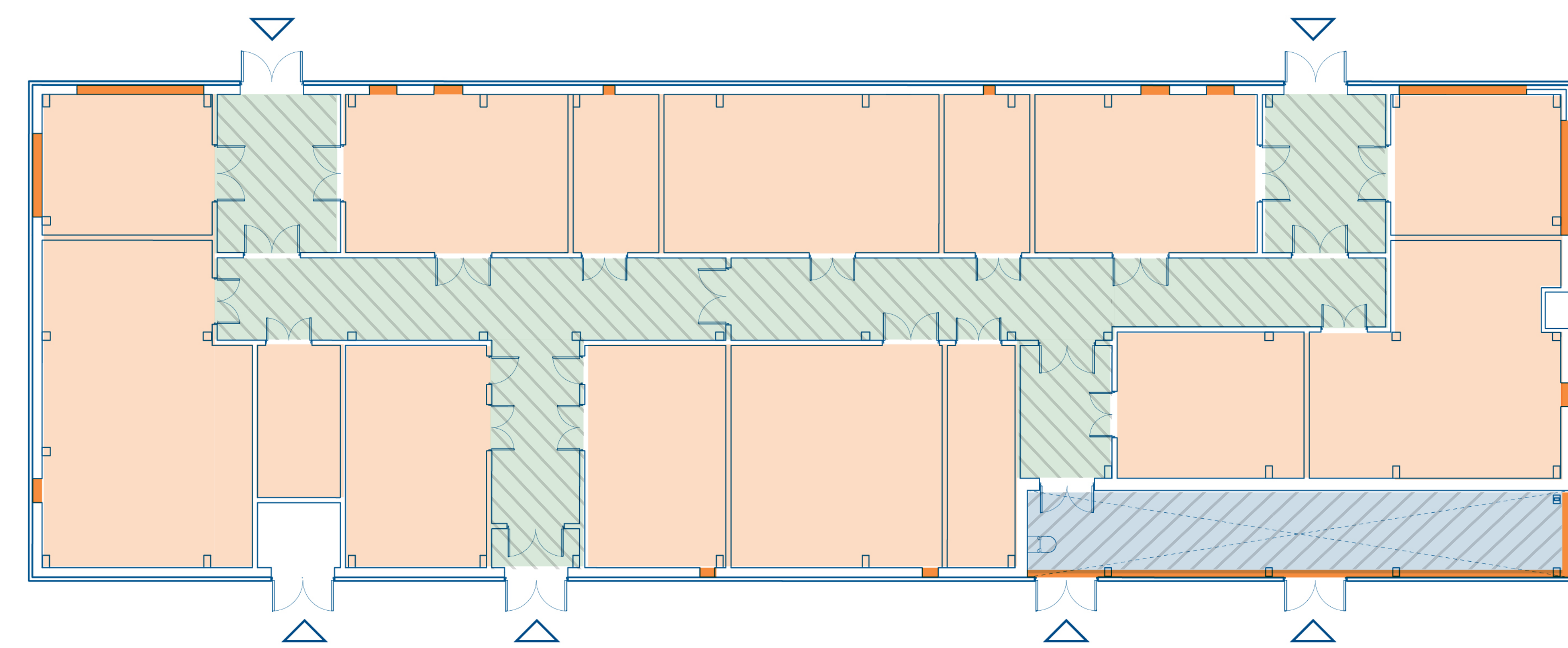
- Accommodates electrical and mechanical plant equipment associated with the railway
- Compound area to provide emergency access and serve as an evacuation area if needed.

## Building design brief

-  Responsive to surrounding site characteristics
-  Integrated as part of the railway environment
-  Simple, robust and enduring robust material palette
-  Considerate of building visibility
-  Consider grassland roofs to integrate buildings
-  Quiet and recessive in relation to massing, scale and texture



3D view – North Portal ancillary building



Functional plan of ancillary building

## Key

- 1 Green roof
- 2 Handrail
- 3 Façade ventilation
- 4 Access doors
- 5 Access ladder to roof
- 6 External plant equipment location
- 7 Maintenance walkway
- 8 Vehicle containment barrier
- 9 Turning circle
- 10 Evacuation point
- 11 Cutting/contours

## Key

- Ventilation openings
- Mechanical and plant equipment room
- Circulation
- External plant equipment
- Compound building access

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# Ancillary building design

**You said:** "Ideally the bulk should be reduced."

**We did:**

**Reduce the scale of the building as much as possible**

## Footprint

We previously proposed a lozenge shaped design. This added additional mass which did not provide any functional benefits due to mechanical constraints. Changing the design to rectangular form reduces the volume of the building by 22%.

### Key

Rectangular form      Lozenge form

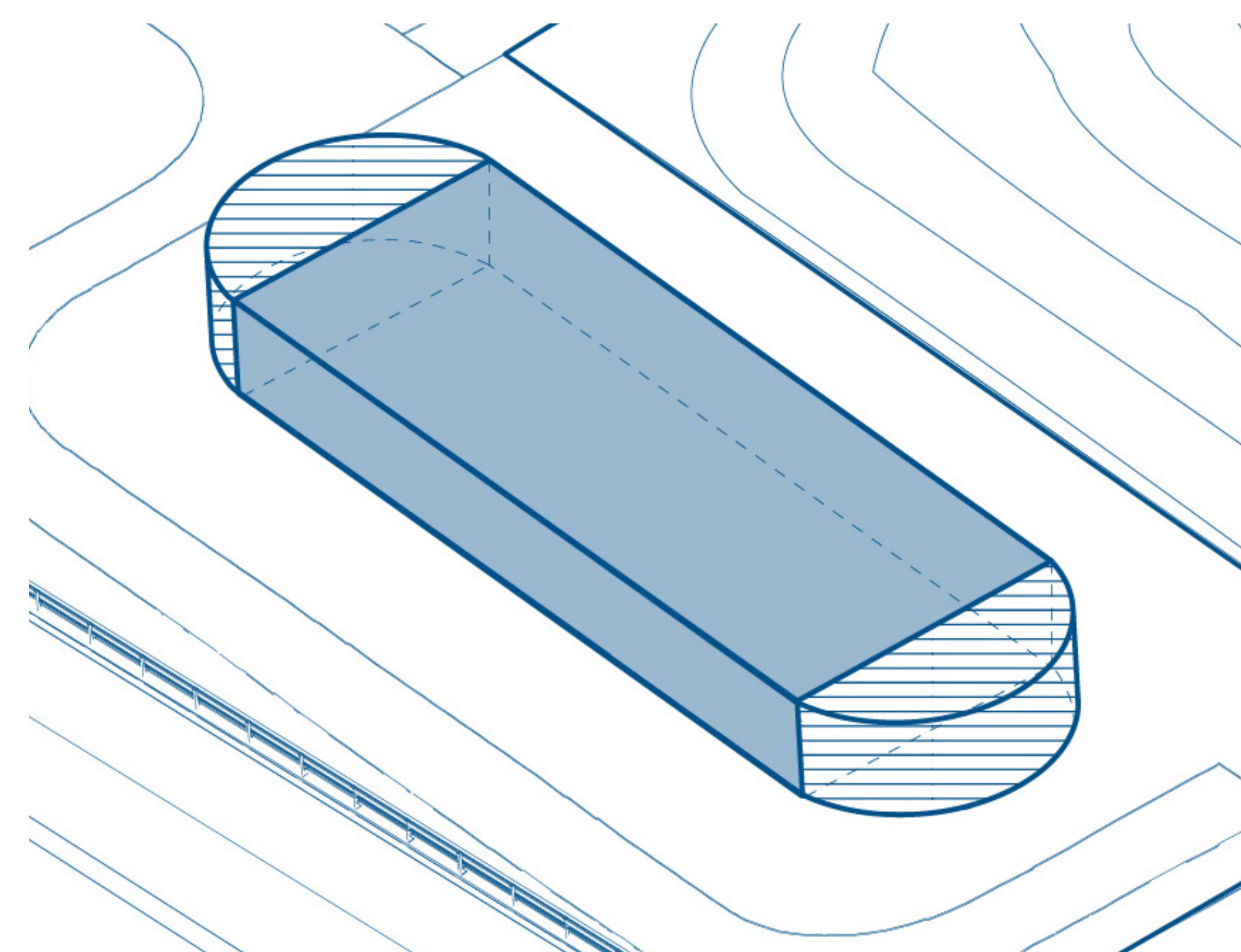
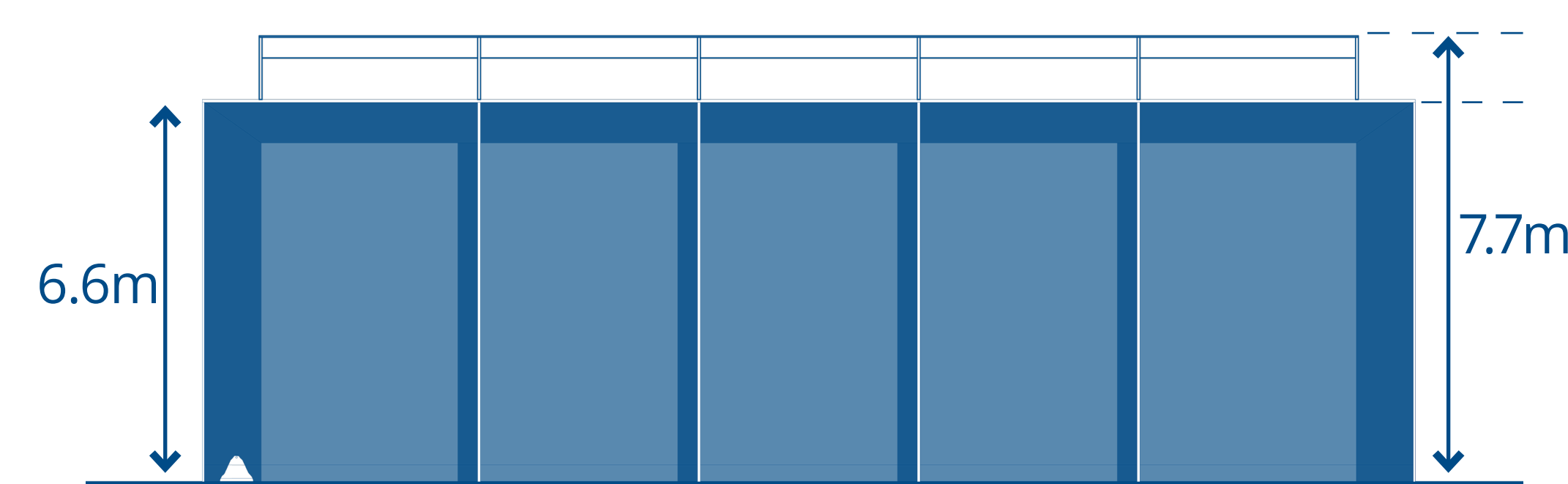


Diagram – Massing comparison

## Height

A slim handrail rather than parapet has been designed to run along the perimeter of the roof to further reduce the scale of the building and to showcase the biodiverse extensive green roof from key viewpoints.

### Building with permanent 1.1m guarding



### Building with 1.1m parapet

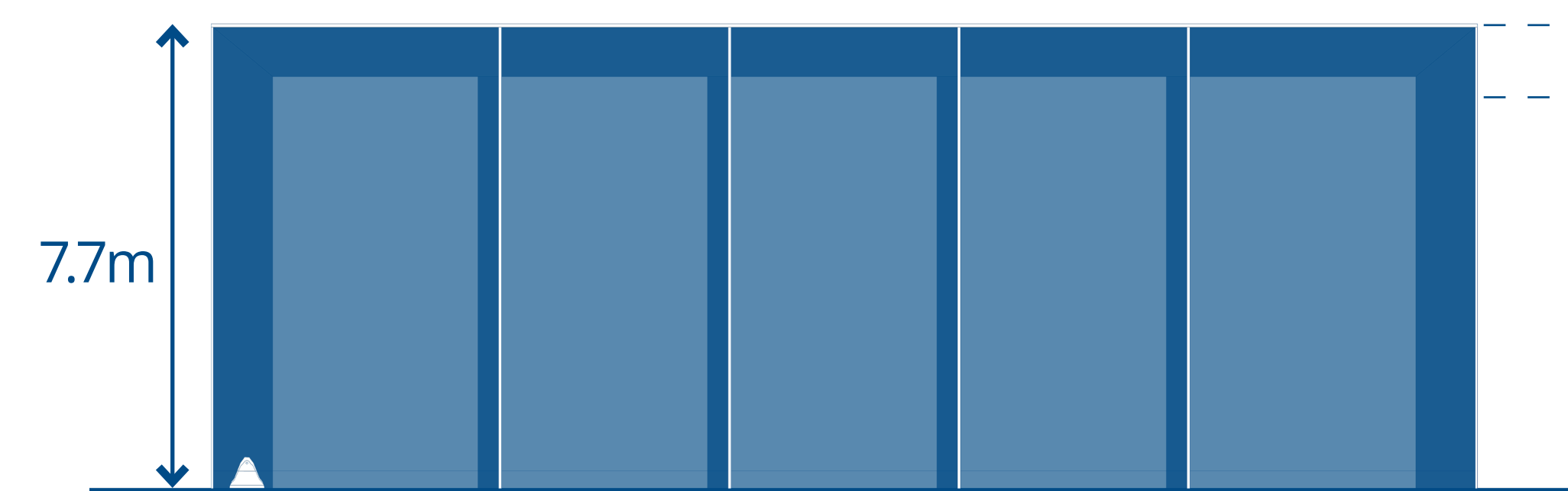


Diagram – A parapet compared to a hand rail

**You said:** "A green roof would help it blend into the surrounding landscape."

**We did:**

**Incorporate a green roof planted with native plant species**



Visualisation – Aerial view of the North Portal ancillary building (Year 15)

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# Ancillary building design

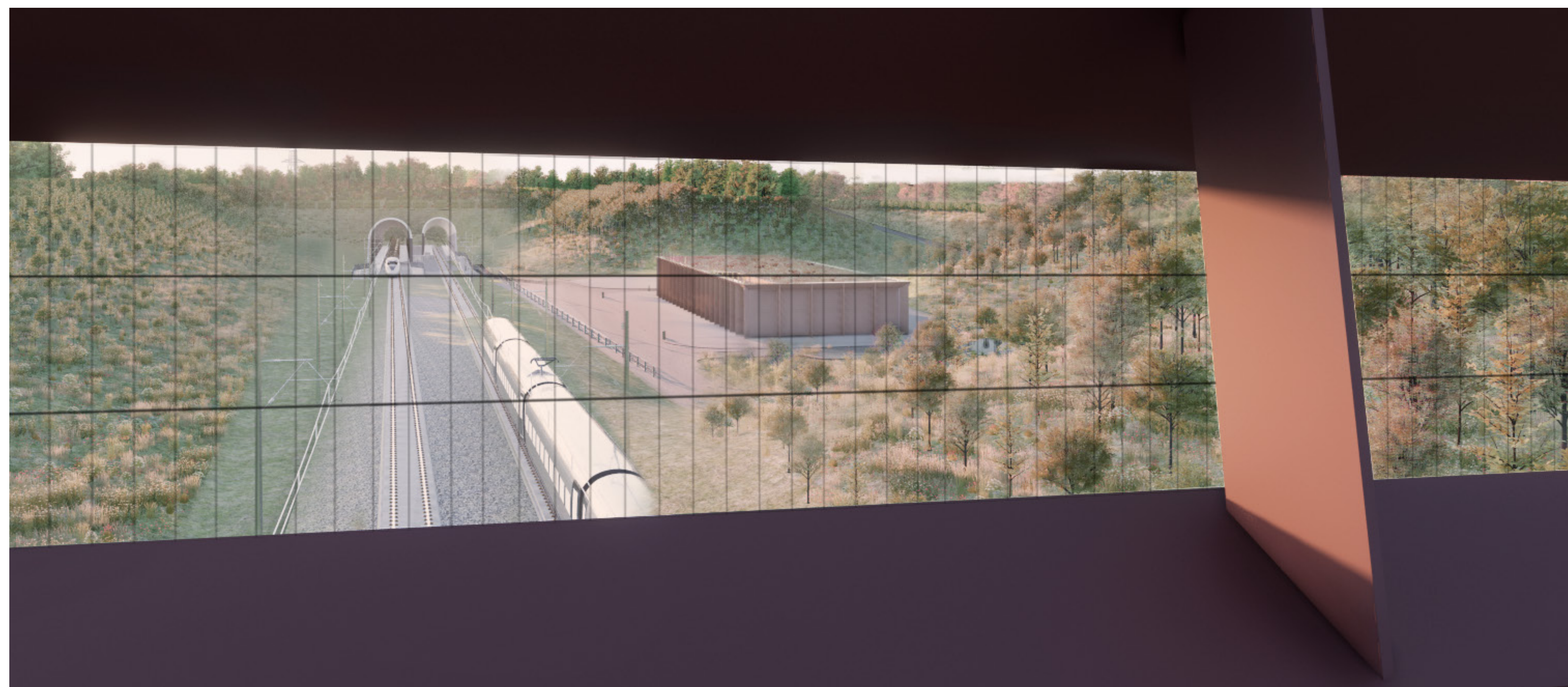
**You said:** "Could the colour be more recessive and warmer in tone?"

**We did:**

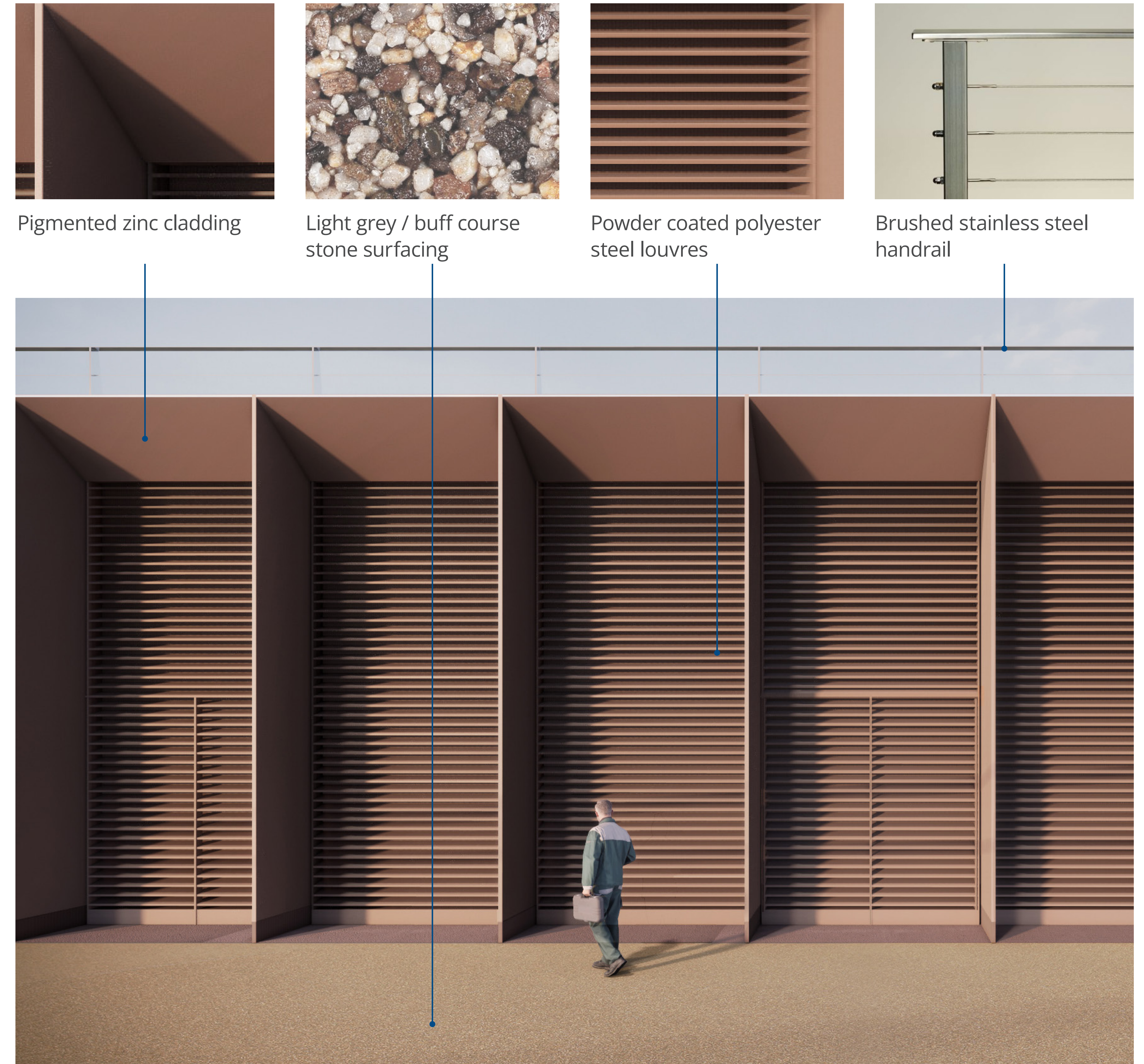
## Introduce a simple and recessive colour palette

The building façade is expressed by a band of vertical elements that add rhythm and relief to the façade. Earth-toned pigmented zinc and painted steel louvres respond to the surrounding woodland and footbridge. The brushed stainless steel handrail has been designed to disappear when viewed from the footbridge.

The compound surface comprises a light grey/buff course stone. A simple, naturalistic colour palette has been selected to appear recessive against both the surrounding railway cutting and AONB landscape. All materials are highly durable to maintain quality over time.



Visualisation – View from GMI/12 footpath over bridge (Year 15)



Visualisation – North Portal ancillary building façade

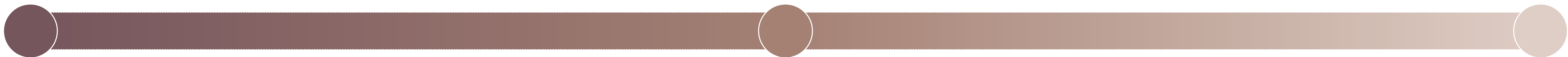


# Ancillary building design

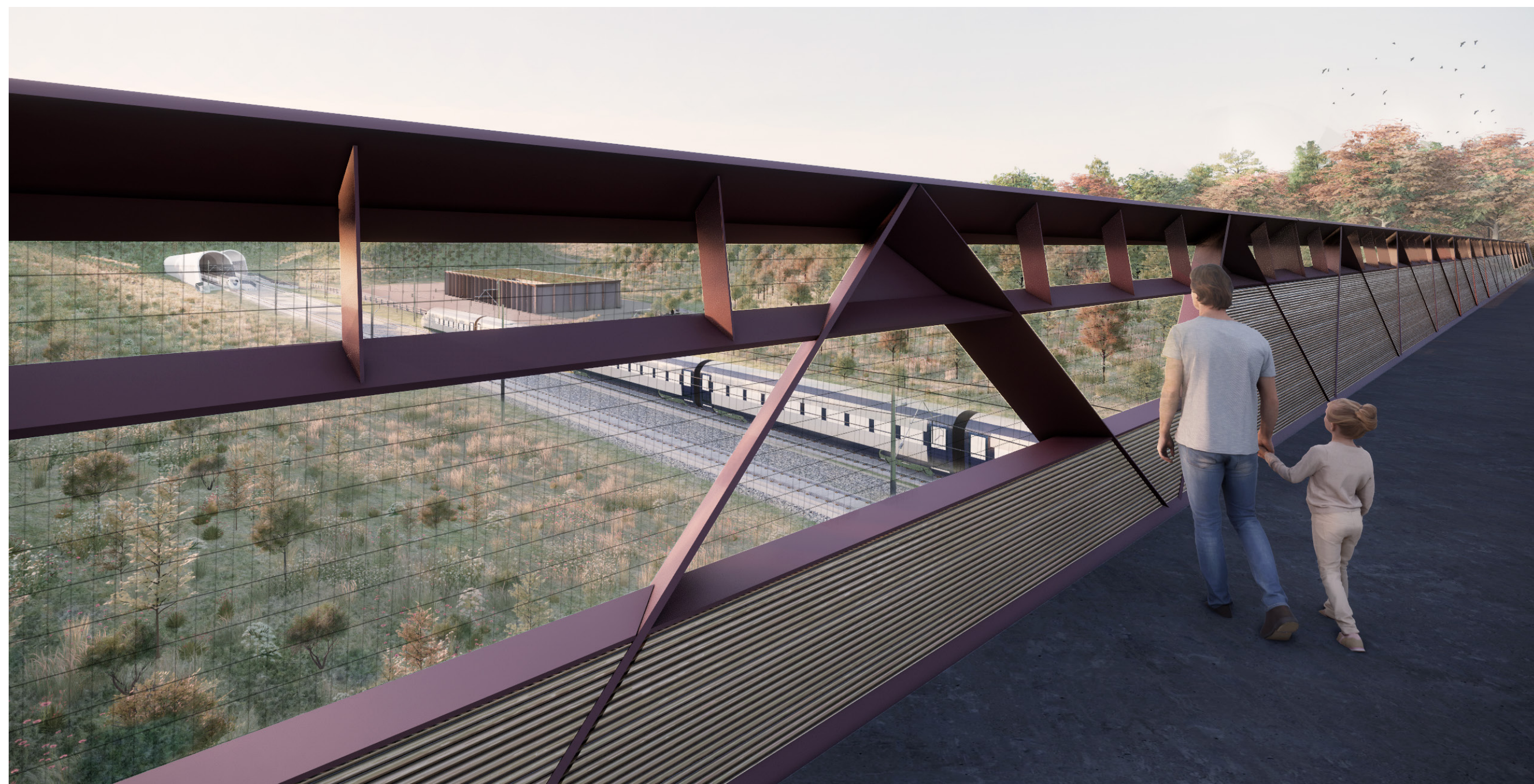
**You said:** "Could the colour be more warmer in tone with the bridge next to it?"

**We did:**

Use a recessive colour palette that blends in with the local landscape and the nearby footbridge



Dark ← → Light



View from GMI/12 footbridge



Portal structures and ancillary building



Portal structures and ancillary building

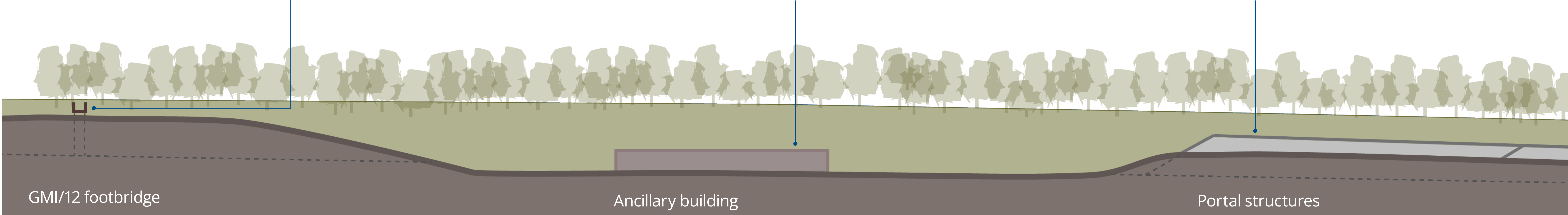


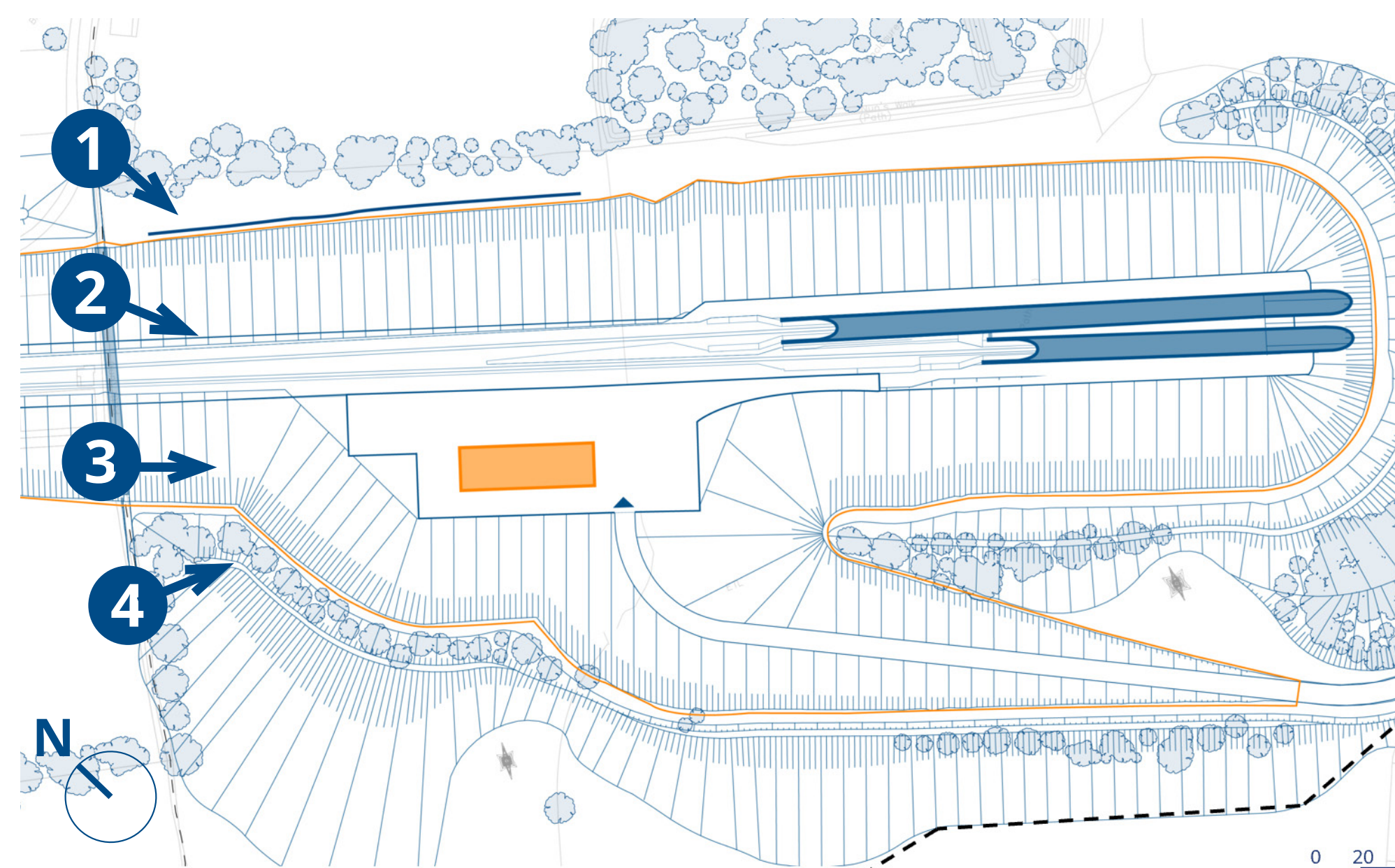
Diagram – Portal structures and ancillary building in relation to the immediate surrounding environment. Note: Planting species shown indicatively, for visual purposes only.



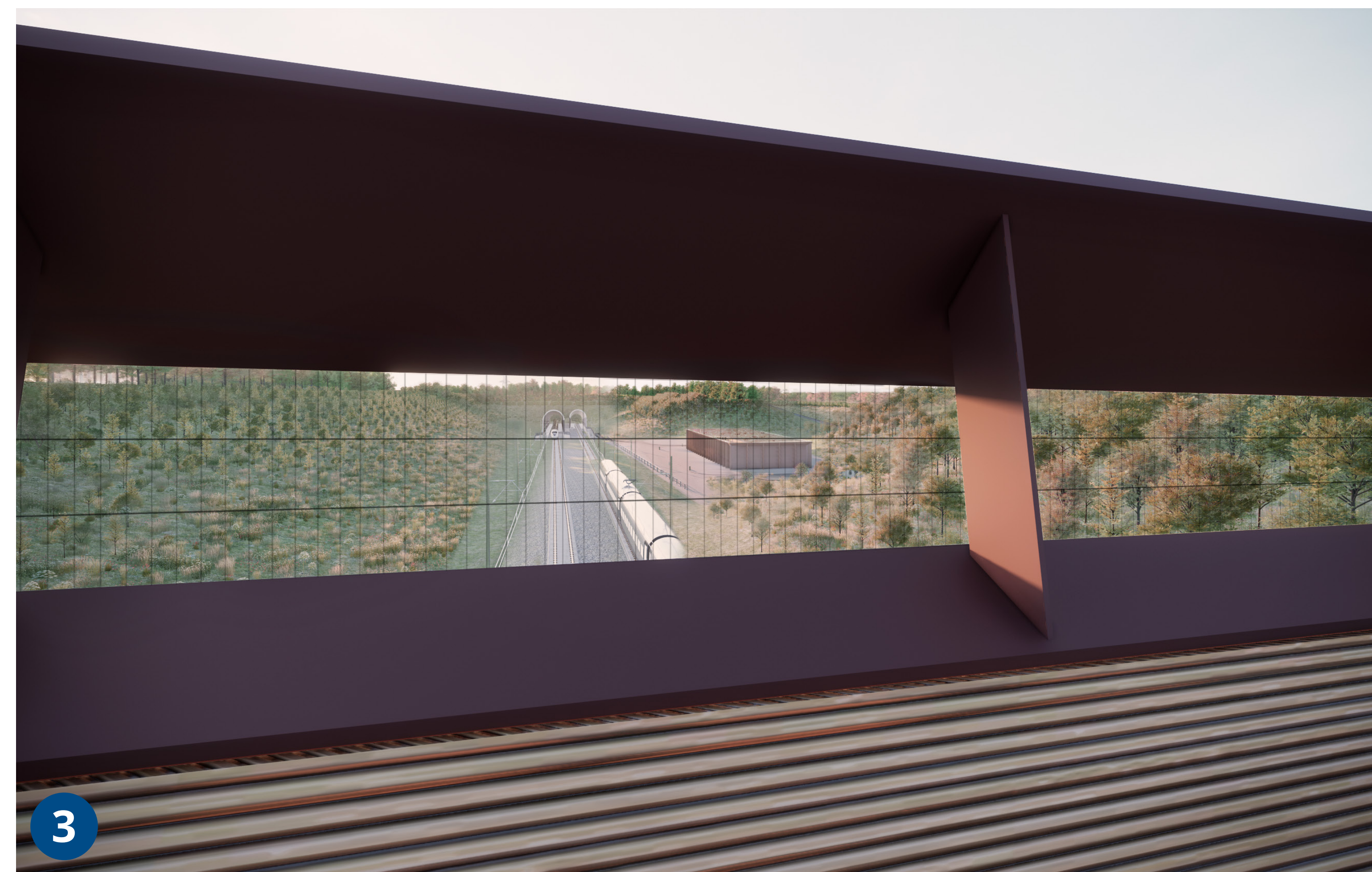
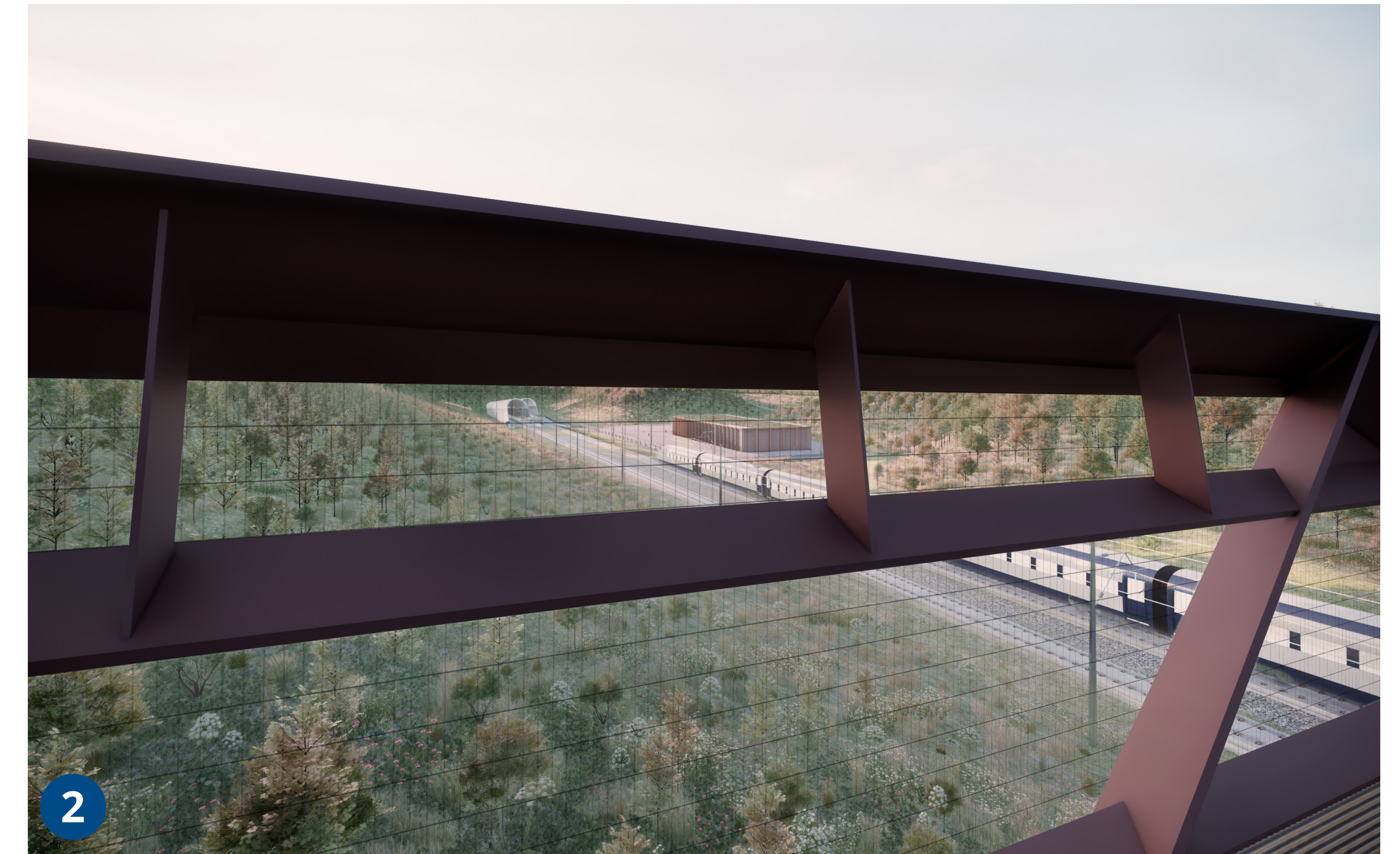
# Visibility

## Context and visibility

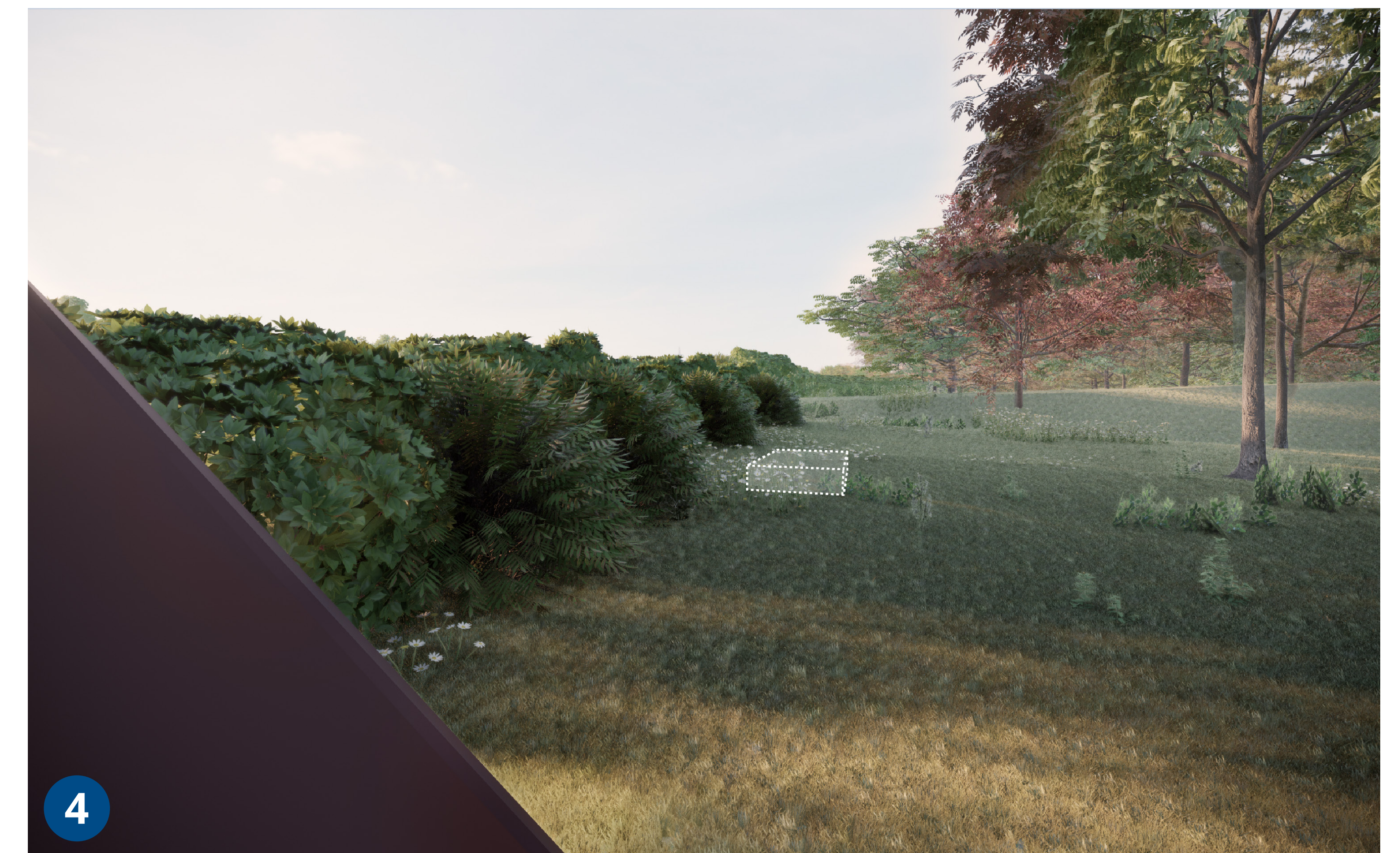
- The portal structures and ancillary building are designed to be screened with landscape earthworks and vegetation to reduce visual impact from long-distance views
- The portal structures and ancillary building are only fully visible from within the railway cutting, or through framed views from the GMI/12 footbridge
- The recessive colour palette and green roof helps the building to sit unobstrusively in the railway cutting and amongst the local landscape.



Plan – Viewpoint locations



Visibility (Year 15)





# Landscape design

The North Portal at South Heath marks the location in the Chilterns where two main works contractors, Align and EKFB, work alongside each other

## Who is EKFB?

EKFB is a joint venture comprised of four civil engineering and construction companies: Eiffage, Kier, Ferrovial Construction and BAM Nuttall.

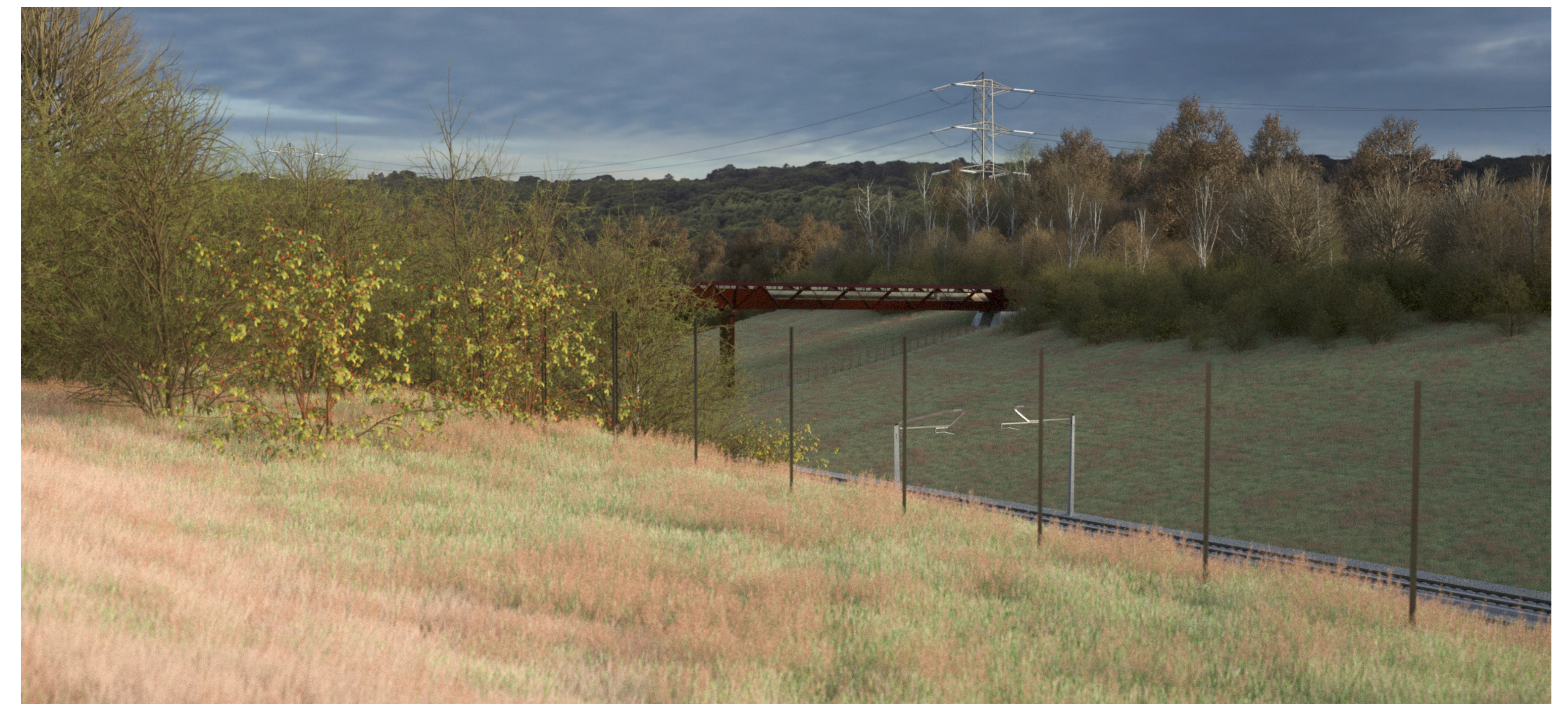
EKFB has been appointed by HS2 to deliver civil engineering works across an 80km section of the new high speed rail link between the Chiltern Tunnel and Long Itchington Wood. Our scope of works around the Chiltern AONB includes the delivery of the earthworks and landscaping alongside the main works from Align.

## Our landscape principles

It is recognised that HS2 will split the transition from valley side to a plateau and this will result in a change in landscape character, but over time the proposed landscape planting will help to conceal the cutting.

We are working to achieve the following design approaches:

- Create an ecology corridor connecting plateau and valley floor
- Create an enhancement of the footpath network
- Retain a sense of openness at selected locations
- Reduce land take for cutting.



The above Illustrations show the landscape around GMI/12 footbridge



# Landscape elements

The tunnel portal will be seen by users of the Public Rights of Way throughout the area

The landscape design includes a focus on the following:

- The existing characteristics of the AONB
- The everyday users of the local footpaths
- The biodiversity of the area and how we can enhance it

The landscape design will reinforce the green corridors established along the route through woodland, hedgerows and wetland habitat creation.

These strong landscape elements help to provide biodiversity connectivity by linking the tunnel portal connecting the planting and engineering design to the surrounding landscape.

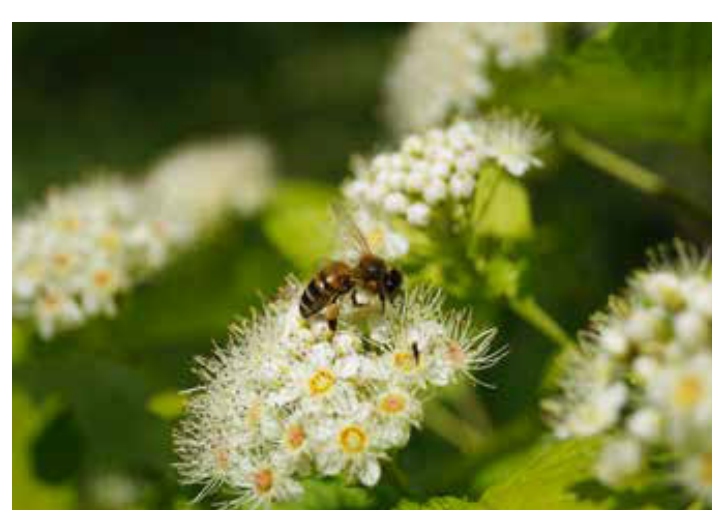
The creation of a strong but simple design, using a combination of landscape earthworks and planting, helps to integrate the cutting and associated operational elements into the existing ridgeline landscape.

The landscape planting introduces new woodland blocks to tie into the historic pattern of ridgeline woodland, associated field boundaries and lane side hedgerows. Pockets of line side vegetation have been introduced within the upper slopes of the cutting to create a soft transition with the appearance of the cutting slope.

Typically the area consists of a wide range of native UK plant species. The landscape design will incorporate tree and shrub planting typically found in the area including:



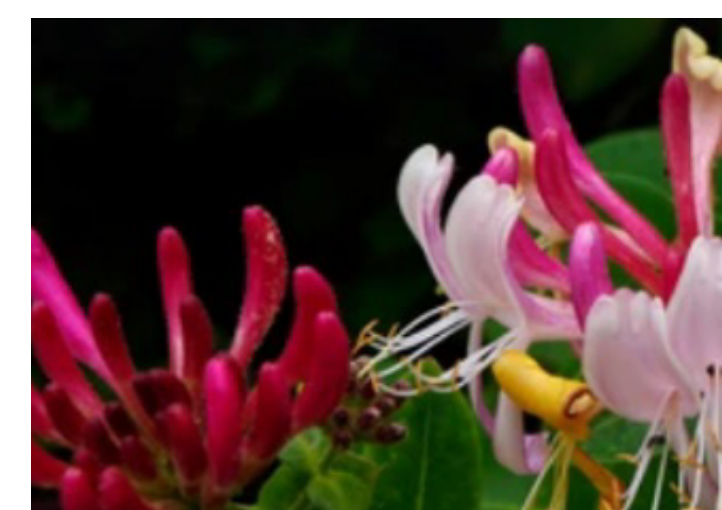
Yew tree



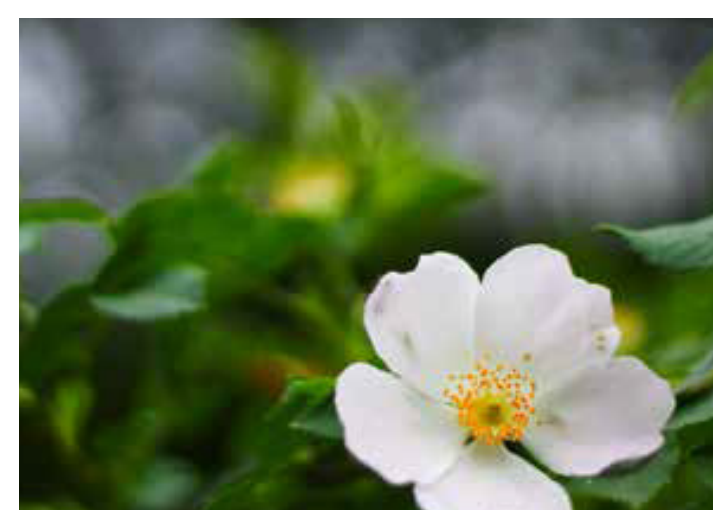
Wayfaring tree



Oak tree



Honeysuckle



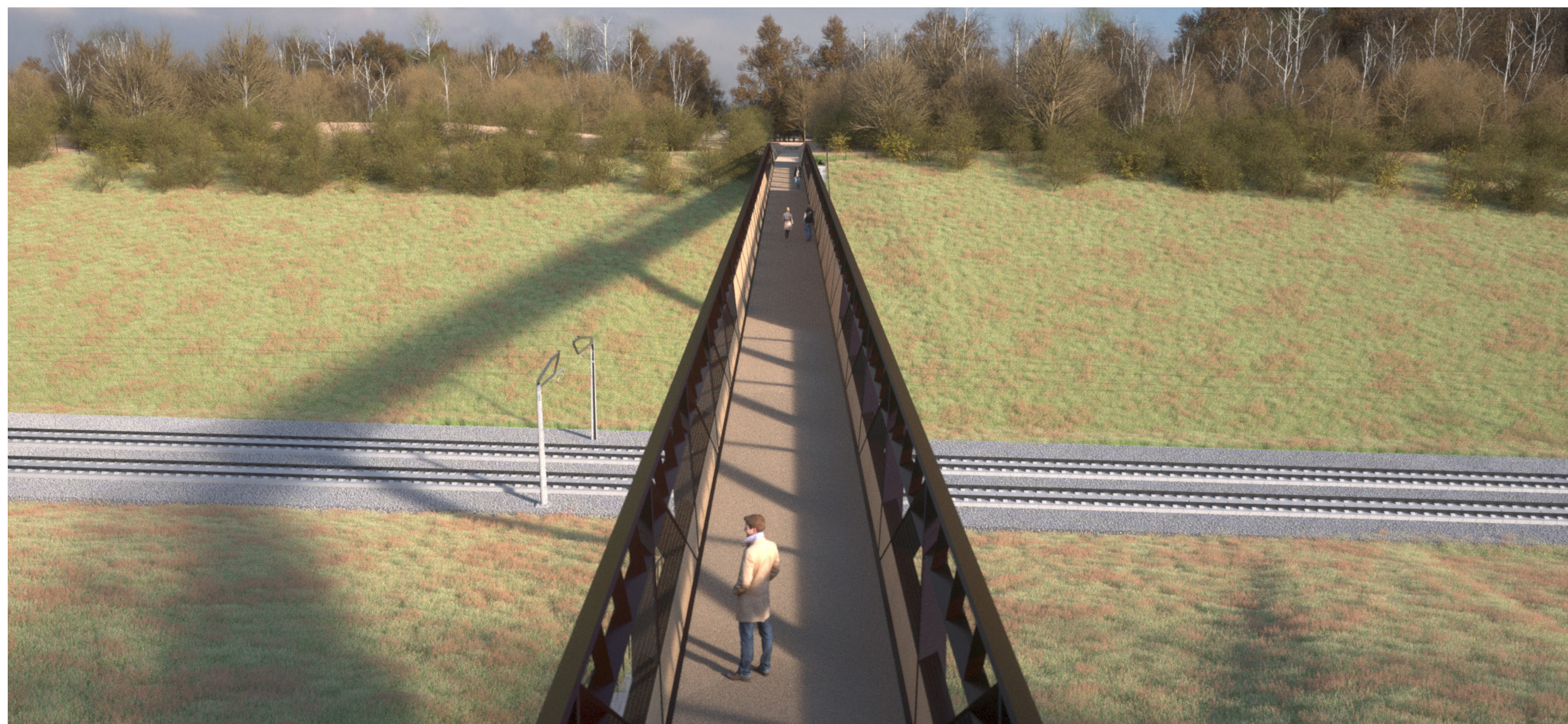
Dog Rose



The above illustrations show proposed track side planting, bands of hedgerows and ecological corridors.



# GMI/12 footbridge



The above illustrations demonstrate the weathering steel finish and design for the GMI/12 footbridge as expected 10 years after operation.



# Traffic management and planning

Heavy Goods Vehicles using local roads in the area of the North Portal is a key concern for local residents. Our routes to each site are carefully planned to reduce impact on local communities

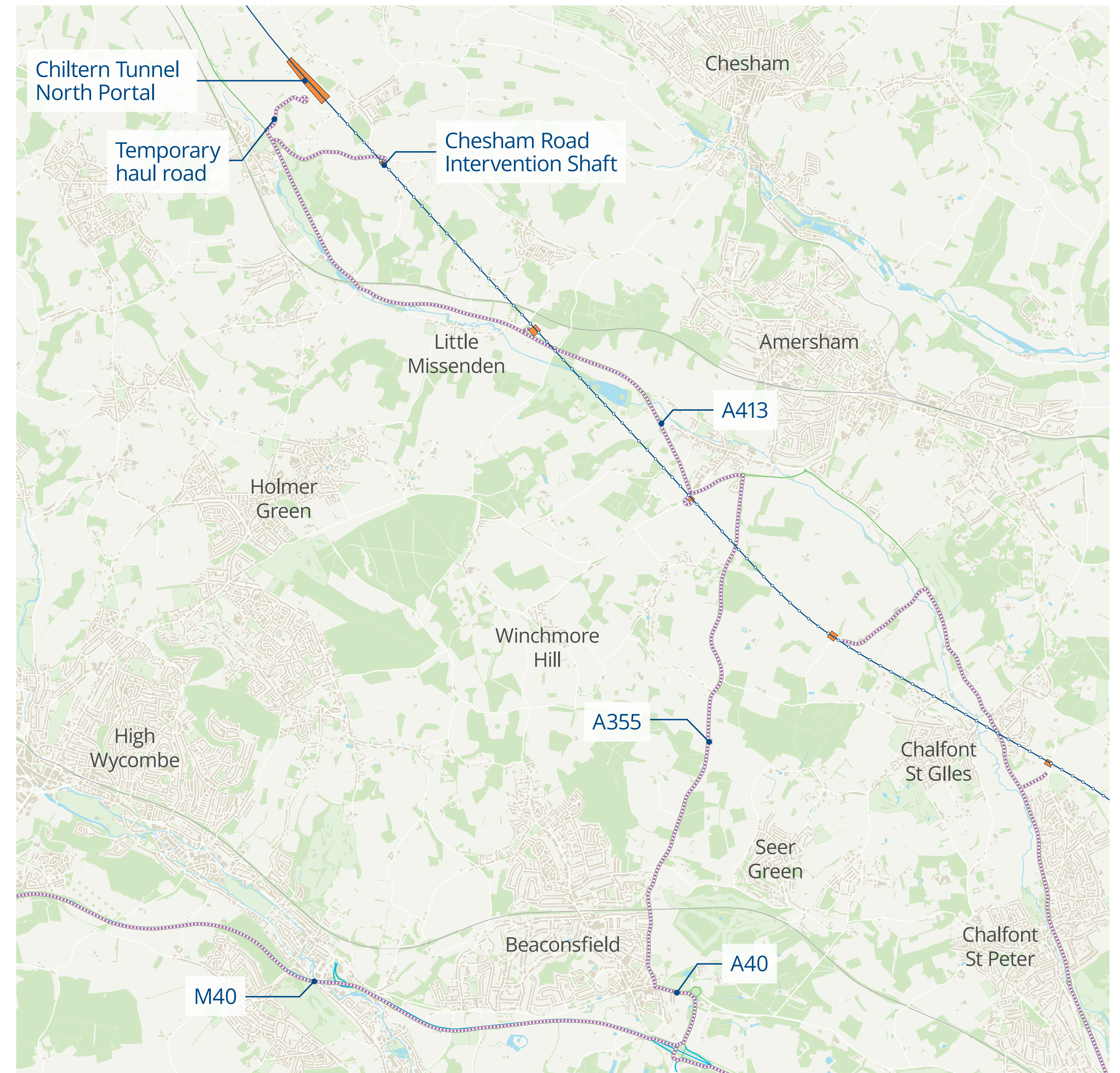
During stages of high activity on site – such as excavation, concreting and Tunnel Boring Machine (TBM) preparation arrival works – there is a corresponding increase in Heavy Goods Vehicle (HGV) movements.

There will also be periods where the need for HGV movements will be lower.

The temporary internal haul road that is accessed via the A413 / Link Road roundabout is our dedicated route that will accommodate all our construction traffic including HGVs.

We are:

- Reducing the number of HGV movements by changing the method of construction on site
- Scheduling all deliveries electronically to prevent congestion near the site. This includes working with the main works contractor EKFB who are building the next part of the line from South Heath northwards
- Utilising the temporary haul road as the sole access route for HGV movements onto site
- Planning to create a concrete batching plant deep within the cutting at the North Portal which will reduce lorry movements on local roads during the heaviest construction periods.



HGV routes to the North Portal site



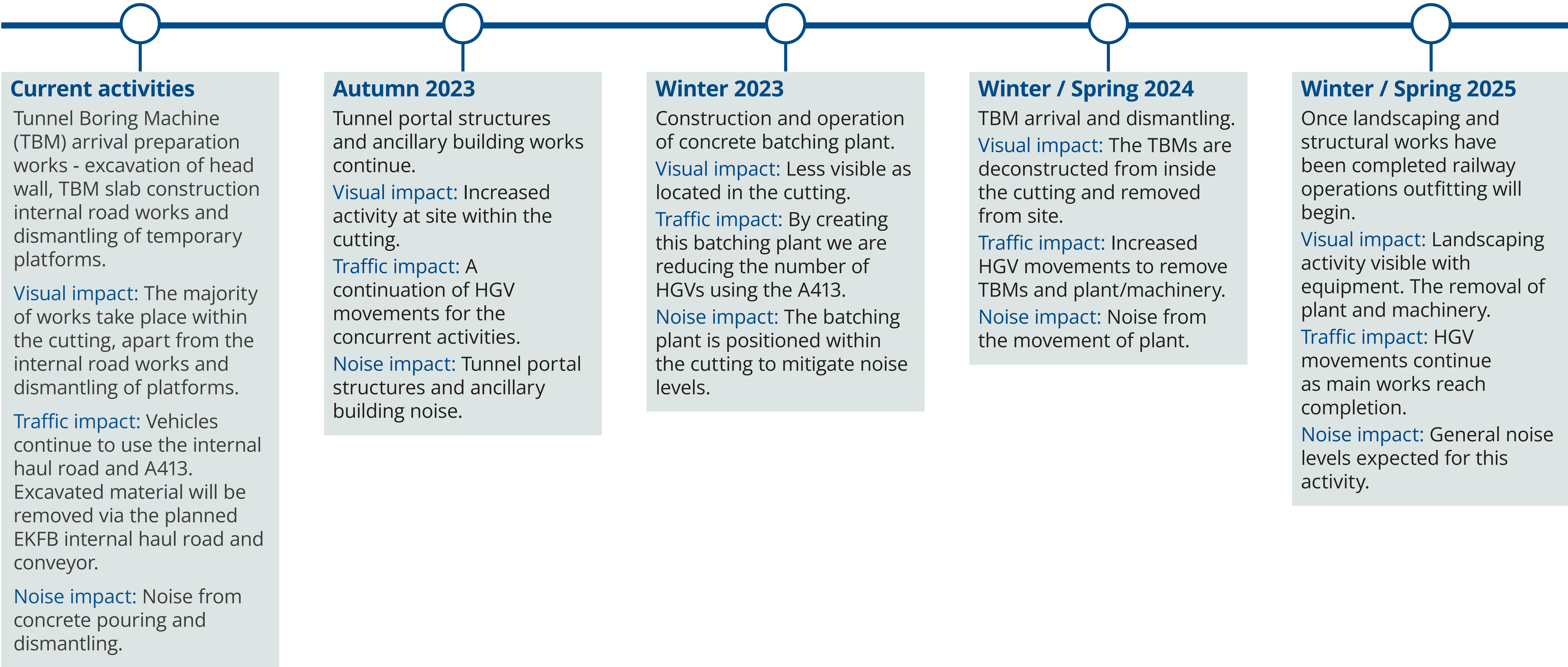
# North Portal timeline

Below is an indicative timeline of construction activities to build the North Portal and ancillary building. We have highlighted those which may be more noticeable to local residents

## Landscape and seeding

Along with the milestone activities described in this timeline, EKFB will be undertaking landscaping and seeding of landforms on a progressive basis across the site.

These landscaping activities will begin at the end of the project once all construction works are complete.





# Thank you

## Next steps

We will continue engagement with the local community to provide regular updates on the progress of construction.

## Information events

For more information and to find out how to receive regular updates, please visit: [www.hs2.org.uk](http://www.hs2.org.uk) and visit the Buckinghamshire and Oxfordshire local area pages. You can contact our HS2 Helpdesk team all day, every day of the year on:

Freephone: 08081 434 434

Minicom: 08081 456 472

Email: [hs2enquiries@hs2.org.uk](mailto:hs2enquiries@hs2.org.uk)



Visualisation – Proposed North Portal structures, ancillary building and GMI/12 footbridge (Year 15). Note: For visual purposes only – view not publicly visible, planting species shown is indicative.

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