



York Central Phase 1 Infrastructure RMA

Design Statement

YCL-GPB-RM1-XX-RP-LD-3000

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1. Introduction

- 1.0 Executive Summary
- 1.1 Introduction

1.0 Executive Summary

This application is the first of the Reserved Matters Applications (RMA) to be submitted for York Central. The proposals will create the new primary access routes for pedestrians, cyclists and vehicles to the York Central site from Water End and will provide connections thorough the site to Kingsland Terrace, Leeman Road, and the York Railway Station.

The Phase 1 Infrastructure RMA includes delivery of a new landscaped highway corridor; construction of two new bridges; including a new pedestrian and cycle bridge on Water End and new roadbridge over the East Coast Main Line, and replacement railway infrastructure for the NRM.

The proposals will integrate with and enhance the existing York network of footways and cycleways by creating new attractive and segregated routes through the the site. These will also generate new connections across the York Central Site.

The Phase 1 Infrastructure RMA will enable the future expansion and development of the National Railway Museum's Central Hall as well as creating access for the future development of the proposals set out in the Outline Planning Permission (OPP) for the York Central Site.

The Design Statement describes the design intent of the proposals for the construction of the new access and sitewide infrastructure and outlines the thinking that has guided the evolution development of the proposals.

The Design Statement explains how the Proposed Development integrates with and responds to the different possible uses and users of York Central and how it links with the existing access network to the site.

1.1 Introduction

York Central Site

York Central has an important role to play in delivering a significant proportion of the overall

Growth of the city as set out in the emerging Local Plan. The site has been designated as a 'Housing Zone' and has also been awarded 'Enterprise Zone' status which offers commercial occupiers significant incentives.

Why the proposed development is being advanced?

Located on one of the largest brownfield sites in the UK, York Central includes opportunities for a new office quarter, new residential neighbourhoods, an expanded and enhanced Railway Museum, improvements to the railway station, including a network of vibrant public squares with routes linking to surrounding neighbourhoods and the City Centre.

Relationship with the Local Plan

City of York Council recently submitted the draft Local Plan (May 2018) to the Secretary of State for examination. The policy SS4 refers to the York Central allocation site having capacity for between 1,700 and 2,500 new homes and 100,000 square metres of commercial floorspace. The plan recognises the significance and importance of York Central in the future growth of the city, and the region.

Statement of Community Involvement

The Statement of Community Involvement (SCI) provides full details of the community consultation and engagement process undertaken as part of the development of the Phase 1 Infrastructure RMA.

The purpose of the engagement on the Phase 1 Infrastructure in February / March 2020 was to provide information about the RMA ahead of the submission. The material emphasised that proposals built on the material which was originally submitted as part of the outline planning application drawing on the previous rounds of engagement feedback and activities. The Phase 1 Infrastructure RMA is very much a continuation of the earlier masterplanning process.

The SCI explains the programme of consultation and engagement which has taken place, and the results from each stage.

Four ways of providing feedback were provided as follows:

- On-line;
- Exhibitions;
- Drop-ins; or
- Stakeholder workshop.

The drop-in sessions were attended by 95 people and 18 people attended the two workshops.

The main focus of the SCI is the summary of key topics arising and responses which are set out in Chapter 4. This provides concise non-technical responses and points readers towards more detailed information elsewhere in the application material.

Outline Planning Permission York Central

Outline planning permission (18/01884/OUTM) with all matters reserved was approved on 24 December 2019 for the redevelopment of the York Central site. The outline planning permission (OPP) with all matters reserved allows the comprehensive phased redevelopment of the land west of the York Railway Station, off Water End and Leeman Road to provide a new mixed-use development comprising:

“Up to 379,729 m² of floorspace Gross External Area (GEA) primarily comprising up to 2,500 homes (Class C3), between 70,000m² and 87,69 m² of office use (Class B1a), up to 11,991m² GEA of retail and leisure uses (Classes A1-A5 or D2), hotel with up to 400 bedrooms (Class C1), up to 12,120m² GEA of non-residential institutions (Class D1) for expansion of the National Railway Museum, multi-storey car parks and provision of community uses all with associated works including new open space, ancillary car parking, demolition of and alterations to existing buildings and associated vehicular, rail, cycle and pedestrian access improvements.”

Phase 1 Infrastructure Reserved Matters Application

This application is the first of the Reserved Matters Applications (RMA) to be submitted for York Central and is referred to as Phase 1 Infrastructure RMA. The proposed scheme will create the new primary access route through the development and

provide new connections through the York Central site. The proposal comprises the following key elements.

- Construction of new vehicular, rail, cycle and pedestrian access routes and improvements;
- Provision of landscaping along the highway corridor.
- Alterations to Severus Road Bridge with a new pedestrian and cycle bridge to the east of the Severus Road Bridge (known as Severus Pedestrian and Cycle Bridge);
- New site access at Water End;
- Creation of a new bridge over the East Coast Main Line (ECML);
- Infrastructure and engineering works, associated with the proposed RMA;

2. Purpose of the Design Statement

2. Purpose of the Design Statement

The Design Statement, describes the design intent of the proposals for the construction of the new access and sitewide infrastructure to be delivered in the first phase of construction works. The document outlines the thinking that has guided the evolution development of the proposals.

It describes the context in which the project has evolved and why this application is being made now. The Design Statement explains how the Proposed Development integrates and responds to the different possible uses and users of York Central and how it links with the existing access network to the site.

This Design Statement has been prepared in accordance with Article 9 of The Town and Country Planning (Development Management Procedure) (England) Order 2015. Its content and scope is in line with CABE guidelines for Design and Access Statements

3. Reserved Matters Application Proposals

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3.1 YORK CENTRAL OUTLINE PERMISSION

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Design Guide

The OPP for the York Central site includes a Design Guide which is an approved document controlled by condition 7. The purpose of the Design Guide is to establish a robust framework for the Application Site that encourages quality of design which will be reflected in the Reserved Matters Applications (RMAs).

The Design Guide is intended to provide guidance to developers, architects and other designers in developing detailed schemes for the York Central site. These guidelines have been developed following a comprehensive process of community engagement and consultation with the CYC, Historic England and other stakeholders.



Parameter Plans

The Design Guide and Parameters Plans work in combination to determine the Maximum Developable Extents (MDEs) on the York Central site. These limits are intended to allow flexibility for the RMAs and to preserve the considerations that have emerged in the course of the pre-application and engagement process.

The Parameter Plans approved as part of the OPP are as follows:

- YC-PP 001 Existing Site Plan
- YC-PP 002 Demolition
- YC-PP 003 Demolition-Enlarged Extract
- YC-PP 004 New Railway Additions
- YC-PP 005 Development Zones – Above Ground
- YC-PP 006 Access and Circulation Routes
- YC-PP 007 Development Zones Ground Level Uses
- YC-PP 008 Development Zones Upper Floor Uses
- YC-PP 009 Development Zones Below Ground
- YC-PP 010 Development Zones and Maximum Heights
- YC-PP 011 Proposed Site Levels
- YC-PP 012 Open Space Areas

In addition to the Parameter Plans the following drawings have been generated for information purposes.

- YC - IL 100 Illustrative Masterplan
- YC - IP 001 Existing Structures
- YC - IP 002 Retained Buildings
- YC - IP 003 Existing Site Levels
- YC - IP 004 Topographic Survey
- YC - IP 005 Operational Rail Boundary

- YC - IP 120 Illustrative Phase 01
- YC - IP 121 Illustrative Phase 02
- YC - IP 122 Illustrative Phase 03
- YC - IP 123 Illustrative Phase 04

3.2 OBJECTIVES OF THE PHASE 1 INFRASTRUCTURE RMA DEVELOPMENT

The purpose of this Phase 1 Infrastructure RMA is to create new access routes into the York Central site for pedestrians, cyclists and vehicles to support the future proposed development of the masterplan proposals identified in the OPP.

The proposed development will include the construction of a new primary junction on Water End to the west of the site and will connect to the Leeman Road Tunnel to the east. A new link road will provide a connection from this access road to Leeman Road and Kingsland Terrace on the northern boundary of the site.

New segregated pedestrian and cycle routes with associated landscape will be provided to connect with the wider existing network. A new foot and cycle bridge adjacent Severus Bridge to improve access to the site from Holgate

The new access road will open up access to the heart of the York Central site with a new road bridge over the East Coast Mainline (ECML). The new highway will provide access for buses, coaches, taxis and private vehicles and will create an access to the west entrance of the York Railway Station and will connect through Leeman Road Tunnel to York city centre.

The creation of the new access road and new pedestrian and cycle links through the site will enable the stopping up of a portion of Leeman Road to enable the development of the National Railway Museum's Central Hall.

Homes England, Network Rail and the National Railway Museum have applied to the Department for Transport for a Stopping Up Order (SUO) for part of Leeman Road. This is a separate legal process to the Phase 1 Infrastructure RMA.

The proposed development will also replace the existing NRM Rail Line to the north of the new access road maintaining the future access by rail for NRM exhibits.

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4.1 OUTLINE PLANNING PERMISSION

The OPP established the key parameters for the development of the York Central scheme. The design of this Phase 1 Infrastructure RMA was developed to respond to these parameters. Specifically, the parameters governing the design of the Phase 1 Infrastructure RMA are as follows:

- YC-PP 002 and YC-PP-003 Demolition – A number of buildings will be demolished to enable the construction of the new access and infrastructure.
- YC-PP-004 New Railway Additions – A new railway spur line has been incorporated into the Proposed Development to provide continued rail access to the NRM. YC-PP-004 identifies the corridor within which the railway is to be provided.
- YC-PP-005 Access and Circulation Routes – The proposed access brought forward in this Phase 1 Infrastructure RMA has been designed in accordance with the parameters set out in YC-PP-005.
- YC-PP-011 Proposed Site Levels. This parameter plan set the upper envelope for the access highway and this Proposed Development has been designed to not exceed these maximum heights.
- YC-PP-012 Open Space Areas – The approved OPP incorporates significant new green infrastructure and open space. This Phase 1 Infrastructure RMA includes alteration and enhancement of Millennium Green to integrate the access road into the existing open space adjacent to Water End. The access road will create the southern boundary of the central green space, referred to as the Great Park (the park does not form part of this RMA). The central access road design has been developed to integrate landscape into the proposals including new landscape verges and street trees.

4.2 YORK CENTRAL DESIGN GUIDE

In addition to the Parameters Plans the Phase 1 Infrastructure RMA has been designed in accordance with the principles of design set out in the Design Guide. A Design Guide Compliance Statement has been prepared and submitted alongside this Design and Access Statement. This compliance statement reviews the proposals and confirms adherence to the mandatory development codes including layout, circulation routes, landscaping and spatial dimensions

for key infrastructure elements.

DESIGN GUIDE DIMENSIONS

PARK STREET	MINIMUM WIDTH
Northern Footway	2.0m
Landscape and Planting Verge	2.5m
Segregated Cycle Lane	3.5m
Central Median	3.0m
Southern Footway	2.5m
Carriageway	-
Carriageway with on-street parking	5.0m

CINDER STREET	MINIMUM WIDTH
Northern Footway	4.0m
Segregated Cycle Lane	3.5m
Southern Footway	4.0m
Carriageway	-

LEEMAN ROAD LINK	MINIMUM WIDTH
Northern Footway	2.0m
Segregated Cycle Lane	3.0m
Southern Footway	2.0m
Carriageway	-

FOUNDRY LANE	MINIMUM WIDTH
Northern Footway	2.0m
Southern Footway	2.0m
Carriageway	-
Carriageway with on-street parking	3.7m

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4.3 HIGHWAY NETWORK

The new access has been designed to provide access to the site for pedestrian, cycle, vehicular, public transport, servicing and emergency vehicles. The new network will also provide access for construction vehicles during the future construction of the commercial and residential developments included in the OPP.

The access road has been designed to be adopted by the City of York Council. The limit of adoption will encompass the carriageway, footways and landscaping verges and medians.

The design of the highway has sought to provide high quality inclusive pedestrian and cycling infrastructure through the Proposed Development. The proposed regulatory speed limit for Park Street from the Leeman Road Link to the Leeman Road Tunnel is 20mph. The road has been designed to incorporate medians and localised narrowing to encourage slower traffic speeds. The proposed development will include new landscaping as well as essential infrastructure to create an attractive place for users from the outset of the York Central development.

The scheme will deliver a fully segregated footway and cycle way from Water End to Leeman Road Tunnel. New landscape medians and verges have been utilised to segregate vehicles from non-motorised users and to provide features which control vehicle speeds.

The access road has been designed to provide a minimal carriageway width with central landscape medians and a mixture of signalised and unsignalised crossing points provided at regular intervals.

The following section outline the key design elements of the proposed access.

4.4 PEDESTRIAN AND CYCLE NETWORK

New pedestrian and cycle routes will be provided as part of this first phase of the development to create new connections to and through the development. The cycle infrastructure will integrate into York's existing cycle infrastructure and enhance the cyclist experience.

The pedestrian and cycle networks have been designed for inclusive access. Throughout the scheme the design has sought to segregate these active travel routes from the carriageway through the introduction of landscape verges and tree planting.

Careful consideration has been given to the interface between the existing footway and cycle network to provide a legible and clear connection to the new segregated infrastructure.

Where gradients are required these have been limited to a maximum of 5% or 1 in 20.

4.5 VEHICULAR NETWORK DESIGN

The Phase 1 Infrastructure RMA will create a new access road for York Central to enable development and to connect the scheme with the existing local and strategic highway network. The access road will provide an alternative route for vehicles currently travelling between Leeman Road Island, Salisbury Terrace and the City Centre.

The highway network has been designed to the following standards:

- Department for Transport;
- Manual for Streets;
- Manual for Streets 2 - wider application of the principles;
- City of York Council – Highway Design Guide; and
- Design Manual for Roads and Bridges (DMRB)

The proposed regulatory speed limit for Water End is 30mph (as existing).

The proposed regulatory speed limit for the new western access to York Central to the junction with the proposed Leeman Road West is 30mph.

The proposed regulatory speed limit for the primary

vehicle route from the junction with the proposed Leeman Road west, through the development and to Marble Arch is 20mph.

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The minimum lane width of 3.0m has been provided along Park Street, Cinder Street and Leeman Road Link. Segregation provision has been made for pedestrians and cyclists. A 3.5m wide two-way cycleway will be created to directly link Water End to Leeman Road Tunnel. A segregated 2.0m footway will be provided adjacent this cycle lane. To the south of the Park Street a 3.0m wide footway will be provided.

The carriageway width for Foundry Way, a secondary street, is 4.8m. 2m wide footways are provided to the east and west of the main carriageway.

4.6 SCHEME DESCRIPTION

4.6.1 Access Road

Water End Junction

A new junction at Water End and creation of the primary access road linking the existing highway at Water End to Station Avenue/Station Road (A1036). Leeman Road Link will provide a connection from Park Street to the junction of Kingsland Terrace and Leeman Road.

The existing Severus Road Bridge carriageway will be widened to create a new right-turn lane into the site at the new access junction.

The junction has been designed to make provision for the delivery of NRM exhibits by the road network where they are unable to be transported by rail.

The existing pedestrian and cycling infrastructure on Water End and Severus Road Bridge will be improved and integrated into the new Water End Junction.

A new shared footway and cycleway on the north side of Water End is proposed to connect with the existing segregated and on-carriageway cycle lanes. A new signalised toucan crossing point will be created to connect users with the new 4.0m shared foot and cycle bridge to the south of Severus Road Bridge.

The new junction will provide crossing facilities for

pedestrians and cyclists to connect to the segregated provisions within the York Central site. These will be signalised to provide a safe and convenient crossing point.

Millennium Green

The new access will cross through to the south of the Millennium Green. The highway will be elevated above the Millennium Green with landscaped terraces sweeping down to Holgate Beck.

The existing path network through the Millennium Green will be renovated and new accessible routes from the green will be provided through the terraces to connect to the new footways on the access road and provide new connections to Water End.

A new access track will be provided for the Millennium Green Trustees to improve the access to the green for routine maintenance activities.

The landscaping proposals are outlined in greater detail in Section 4 of this Design and Access Statement.

Park Street

Along Park Street, a fully segregated cycleway and pedestrian footway will be provided. As the new route descends from the East Coast Main Line Bridge, new landscape verges and tree planting will be provided to further separate the route from the carriageway.

At the approach to junctions the segregated cycleway and footway will be terminated, and users will enter into a shared space prior to the carriageway crossing points. Appropriate signage and tactile paving have been incorporated to designate the interface between the segregated and shared zones.

Crossing facilities will be provided at intervals along Park Street to provide future connectivity with the development plots to the south of the access road and with the park to the north.

The road will incorporate on-carriageway bus stops for inbound and outbound services. A small number of on-street

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parking bays on the southern side of the carriageway.

Temporary landscaping will be created along the northern edge of the footway between pedestrians and the site hoarding prior to the future construction of the park.

All routes will be adequately lit to provide safe access at all times.

Seating, bins and other street furniture will be provided at regular intervals.

Cinder Street

The character of the street will change from the parkland setting of Park Street to a more formal urban space.

New generous footways will be provided on both sides of the highway through the Station Quarter. New signalised crossing facilities will be provided for the future connection with Wilton Rise, a new 5.0m wide crossing to the West Station Entrance and 3.0m wide crossing to the NRM Museum Square.

In this Phase 1 RMA application the existing NRM boundary wall will be retained in front of the museum forecourt. To the west of the wall, a segregated cycle and footway will be installed to maintain continuity of the pedestrian and cycle provision on Hudson Boulevard. The new route will pass through the NRM forecourt and listed gateposts. 2 new coach bays will be provided to the east of the wall will be created for visitors to the NRM.

A new priority bus lane will be provided along the in-bound direction (towards the City Centre). This will enable buses to move through the development more efficiently. The bus lane will merge back into the main carriageway in advance of the primary crossing facility to the Station west entrance.

2 new bus stops will be provided to the south of the pedestrian crossing facility for inbound and outbound services.

A new vehicle drop-off area will be constructed to close the west station entrance providing enhanced access to the

station from within the development site.

A new set-down and pick-up facility will be created for the NRM tourist road train which currently utilises the museum forecourt. This will be located to the east of the highway close to the Coal Drops. 2 new coach set-down areas will also be provided in the Station Quarter for rail-replacement services.

The Phase 1 Infrastructure works include the construction of circular rejection loop to enable vehicles to enter and leave via the development via Water End. This facility is also required to enable high-sided vehicles exceeding the height limit under the Leeman Road Tunnel to turn safely.

A service access will be maintained on Leeman Road to provide access for the NRM, Northern Power-grid and Network Rail to their existing assets to the north of the NRM building.

Hudson Boulevard

A new pedestrian foot street will be created with a segregated cycle lane to provide a direct link between Park Street and Museum Square adjacent to the NRM.

A new connection to the north will be established to link to Leeman Road via the NRM's South Yard and Foundry Way for cyclists and pedestrians.

Landscape medians will create attractive separation between cyclists and pedestrians. Temporary landscape will be created between the cycleway and the NRM along the route of the future exhibition line.

Museum Square and the NRM Forecourt

Cinder Street and Hudson Boulevard will converge at Museum Square. A generous 5m wide signalised crossing will enable pedestrians and cyclist to cross to the western entrance of the York Railway Station.

The segregated cycleway and footway will be routed through the NRM Forecourt linking with the Leeman Road and Marble Arch.

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A new coach set down will be provided adjacent the Museum Square for groups visiting the NRM. This will provide safe and direct access to the Museum.

Coal Drop's

Opposite the NRM forecourt a new set-down and pick up area will be created for the NRM's tourist road train. This new facility will provide a turning area for the tourist road train to continue to transport visitors between the York Minster and NRM.

The existing topography in the vicinity of the Cinder Lane and the Coal Drops varies significantly in level. To create a level and accessible pedestrian route from the pedestrian crossing from the NRM entrance gate posts to the Marble Arch Tunnel and to the Station the existing ground level immediately to the north of the Coal Drops car park will be raised by approximately 1.5m.

At the southern end of the Coal Drops, the ground level will be raised by approximately 2.5m to provide an accessible route between Museum Square and the western station entrance.

The York station car parking which is currently elevated on ground above the Coal Drops will be removed and the ground level reduced to provide a surface level connection between the rejection loop, Cinder Street and the new pedestrian routes.

Between the accessible routes, the Coal drops will be partially infilled to create a gently sloping surface which will connect to the primary access route between Museum Square and the western station entrance and the secondary pedestrian crossing to the NRM. A temporary surface will be applied to this area and hoarding will be erected prevent unauthorised access in advance of the detailed design and future RMA for this new area of public realm.

Leeman Road

The section of Leeman Road from the west of the NRM buildings to the Bullnose Building will be 'stopped up', to enable the expansion of the NRM across Leeman Road and to bring about quality of life improvements to the residential

areas of Leeman Road, and in the Garfield Terrace/ Salisbury Road area.

The part of Leeman Road to be 'stopped up' has been set out in an application (under Section 247 of the Town and Country Planning Act 1990) submitted to the Secretary of State for Transport on 25 February 2020 (Reference 1400001968 – Y&H/385).

Leeman Road Tunnel and Marble Arch

A key component of the proposals is to improve the access through Leeman Road Tunnel and the Marble Arch for existing and new residents and cyclists. The Marble Arch will be designated as a pedestrian only route to enhance the experience for visitors to York Central.

A new two-way segregated cycle lane will be provided for cyclists within Leeman Road linking to the segregated provision with York Central. This cycle lane will link directly to the existing route on the west side of the Sorting Office thereby providing improved connections from York Central to the Riverside cycle lane, York Station and the recently completed cycle and footbridge across the River Ouse.

The Leeman Road Tunnel will be reduced to a single carriageway for vehicles with a one-way working system controlled by traffic signals, along with a dedicated cycle route (see above). This will be the primary route through the site, from the east, and will link to a secondary street network. The vehicular access to the *site will* be retained at the Leeman Road Tunnel to the north

New lighting will be provided to significantly improve the visibility and accessibility of the Leeman Road Tunnel.

Leeman Road, Station Rise and Station Avenue

A new signalised pedestrian crossing will be installed and integrated into the two-way working system to provide an improved and safe crossing point for pedestrians. The crossing will be located immediately to the east of the tunnel and will provide direct connection to the riverside and the new crossing of the River Ouse at Scarborough Bridge.

The existing footway on the north-side of Leeman Road will

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be widened to create a 3.0m wide shared footway passing the Royal Mail Depot and connecting to Memorial Gardens.

The width of the south-western side of the footway on Station Rise has been improved in some areas through increasing the width of the footway to 3m. There is a pinch point at the junction of Station Rise and Station Road where the footway width is 1.8m. However, due to land ownership issues and the existing design of the highway the width of the footway will not be altered in this location. This is approximately 2% of the overall footway length from Station Avenue to the Leeman Road Tunnel.

To improve the pedestrian and cycle provision the carriageway width will be reduced to provide a minimum width of 3.0m lanes.

A new courtesy crossing facility will be provided for pedestrians to cross to the footway on the south of carriageway.

Foundry Way

The existing Concrete Depot the west of the NRM will be demolished and a new access road, Foundry Way will be constructed. This street will provide a direct connection between Leeman Road and Hudson Boulevard for pedestrians and cyclists.

Cyclists will travel on carriageway to the connect to the segregated cycle provision through the South Yard while pedestrian footways will be created on each side of the street. The street will be carefully landscaped to improve the environment for pedestrians and cyclists and to provide an attractive route from Leeman Road to the Station Quarter.

This street will provide the alternative dedicated pedestrian and cycle route following the stopping up of Leeman Road and the future construction of the Central Gallery An avenue of trees will created interspersed with on-street car parking facilities for future developments. A total of 21 new on-street spaces will be provided.

Foundry Way will provide a new route for pedestrians and cyclists between Leeman Road and Hudson Boulevard. This secondary street will be designed to support the primacy of

cyclists and pedestrians by minimising the carriageway width and integrating landscaping and tree planting.

The street will also provide access for the NRM to their visitor car park and to the South Yard. A small number of on-street parking spaces will be provided to serve the future development plots to the east and west of the new road.

In advance of the development along Foundry Way, a vehicle barrier will be installed to prevent private vehicles from utilising the street to the south of the access to the NRM visitors car park.

Foundry Way will connect with a segregated cycleway and footway through the NRM South Yard and onwards to Hudson Boulevard.

4.6.2 Public Transport Infrastructure

This Phase 1 Infrastructure RMA includes provision for public transport and inclusive travel.

New bus stops will be provided along the new access road, providing three bus stops in each direction. These will be located at intervals to serve the existing and new residents and office / commercial workers.

In addition, a small bus hub will be provided to the south of Museum Square, comprising a bus stop in each direction. This will serve York Railway Station, NRM and office workers. Bus stops will be provided in lay-bys with shelters, seating and timetable information.

A 3.5m wide dedicated bus lane along Cinder Street will provide for public transport vehicles.

New drop-off facilities will be provided for up to 12 vehicles with direct connection to the wester entrance of the York Railway Station. These facilities can also be used by taxis dropping off passengers for the station.

4 Design Approach

4.6.3 NRM Rail Line

This Phase 1 Infrastructure RMA will include provision of a replacement spur line from the existing operational rail at the new ECML Bridge to the NRM South Yard. The existing rail access to the NRM South Yard will be severed by the construction of the new access road.

The new rail line will provide the NRM with a direct connection to the wider rail network enabling them to move exhibits to and from the NRM by rail.

The replacement rail line will also create a new route for the NRM Visitor Experience ride. New buffer stops will be constructed at each end of the line. The development of the Visitor Experience Ride and wider proposals for the NRM's South Yard will be submitted under a separate reserved matters application.

A new buffer stop will be provided on a short length of parallel tracks to the east of the Leeman Road Link. A new buffer stop will also be provided at the eastern end of the line adjacent to the NRM South Yard.

A new road/ rail crossing will be constructed on the Leeman Road Link. A pedestrian/cycle crossing will be constructed through the NRM south yard to provide connectivity between the Foundry Way and Hudson Boulevard. The Road/Rail crossings have been designed in accordance with the requirements of the Office of Road and Rail to ensure their safe implementation and operation.

4.6.4 Additional Landscaping

The Phase 1 Infrastructure will be completed in advance of the wider York Central Development. To improve the environment and experience for the public the scheme will include widened landscape verges adjacent to the footway along Park Street and Hudson Boulevard. This landscaping will provide greater separation between the public and the future development hoardings.

4.6.5 Sitewide Infrastructure

Flood Storage

The new access road will be constructed through Millennium Green which is part of the flood plain for the Holgate Beck. To accommodate the new landscape and terracing within Millennium Green a proportion of the existing flood storage will be relocated to underground storage tanks. These tanks will be located to the east of the ECML and will provide level-for-level compensatory storage to ensure that there is no change to the flood risk upstream or downstream of the site.

Holgate Beck

The Holgate Beck Culvert will be upgraded or rerouted to enable the new approach ramp to the ECML bridge to be constructed over the beck. The beck will remain in culvert due to its depth below ground level of approximately 5.0m.

Surface Water and Foul Water Drainage

The Proposed Development will include surface water and foul water drainage to support the future development of the OPP proposals.

The surface water network will comprise of a development drainage network and an adopted highway network. The surface water networks will be designed to incorporate sustainable urban drainage features to minimise the volume of traditional below ground drainage infrastructure. Where appropriate the landscaped areas will be designed to accept surface water drainage.

The foul network will be designed for the approved development quantum.

The details of these networks will be submitted separately to the discharge the OPP condition 77.

5. Landscape Design

- 5.1 Design Principles
- 5.2 Character Areas
- 5.3 Phase 1 Infrastructure Landscape Strategy
 - 5.3.1 Hard Landscape Material Palette
 - 5.3.2 Furniture Palette
 - 5.3.3 Planting character areas
 - 5.3.4 Tree planting
 - 5.3.5 Existing trees to be retained and removed
 - 5.3.6 Meanwhile Use and Additional Landscape
 - 5.3.7 Primary Pedestrian and Cycling Routes
- 5.4 Detailed character areas
 - 5.4.1 Western Access & Millennium Green
 - 5.4.2 Park Street
 - 5.4.3 Hudson Boulevard
 - 5.4.4 Station Quarter
 - 5.4.5 Museum Quarter
 - 5.4.6 Concrete Depot, Foundry Way and Leeman Road Link
- 5.5 Secure by Design

5.1 Design Principles

CELEBRATING YORK



It is of prime importance that the York Central development remains connected to the overall character of York. While, in the past, much of the site has been separated from other urban areas within the city, the aspiration of this new masterplan development is to create a district linked both physically and characteristically to the traditional urban precinct of York.

For the Phase 1 infrastructure works of the development, detailed in this report, this can be achieved most significantly in the choice of materiality and planting that are reminiscent of those used throughout the rest of York.

INDUSTRIAL CONTEXT



The historic industrial use of the site is rich context that should be drawn upon for this development. The railway context is of particular interest with the timber, steel, stone and concrete material palette, inherent to rail landscapes, presenting an opportunity for integration into the Phase 1 infrastructure streetscape works.

The planting along the streetscape will also take inspiration from the railway landscape. Native shrubs/grasses and emergent planting ecologies permeate the existing rail yards, creating a strong landscape aesthetic. These durable and resilient native species and overall landscape character will be echoed in the urban planting, along with traditional streetscape species.

DESIGN GUIDE COMPLIANCE



Adherence to the previously established York Central Design Guidelines document is paramount. This document sets a coherent character for both the overall development and the specific zones and areas within the masterplan. Stipulations regarding connectivity, materiality, planting, spatial arrangement, furniture etc. will be observed, in order to ensure this sitewide vision is achieved.

ACCESSIBILITY



Functionality, safety and rationality are the first and foremost concerns of any streetscape and road design. Urban spaces must ensure an ease of use for all stakeholder. Pedestrians, cyclists and vehicles should all have clarity of movement throughout the landscape, free of significant hazards, particularly where these uses intersect at crossings, junctions and squares. Furthermore, consideration to universal accessibility is necessary to ensure the streetscape is practical and coherent for those of all ability.

The Phase 1 infrastructure works, detailed in this document, should provide smooth, segregated corridors of movement through the proposed development, creating an infrastructure of connectivity that future phases can link in with, creating a rational network of movement.

SUSTAINABILITY



The dominant habitat type on site is brownfield, which supports county important assemblages of invertebrates. Mitigation for the loss of brownfield and the mosaic habitats associated with this is required. Other habitat types identified on York Central site which support biodiversity include semi-improved grassland, trees and scrub.

New areas should include the creation of habitat mosaics e.g. scrub fringe/bare ground/grassland interface for invertebrates, woodland/scrub/grassland for bats and birds and a combination of all these features within wetland habitats.

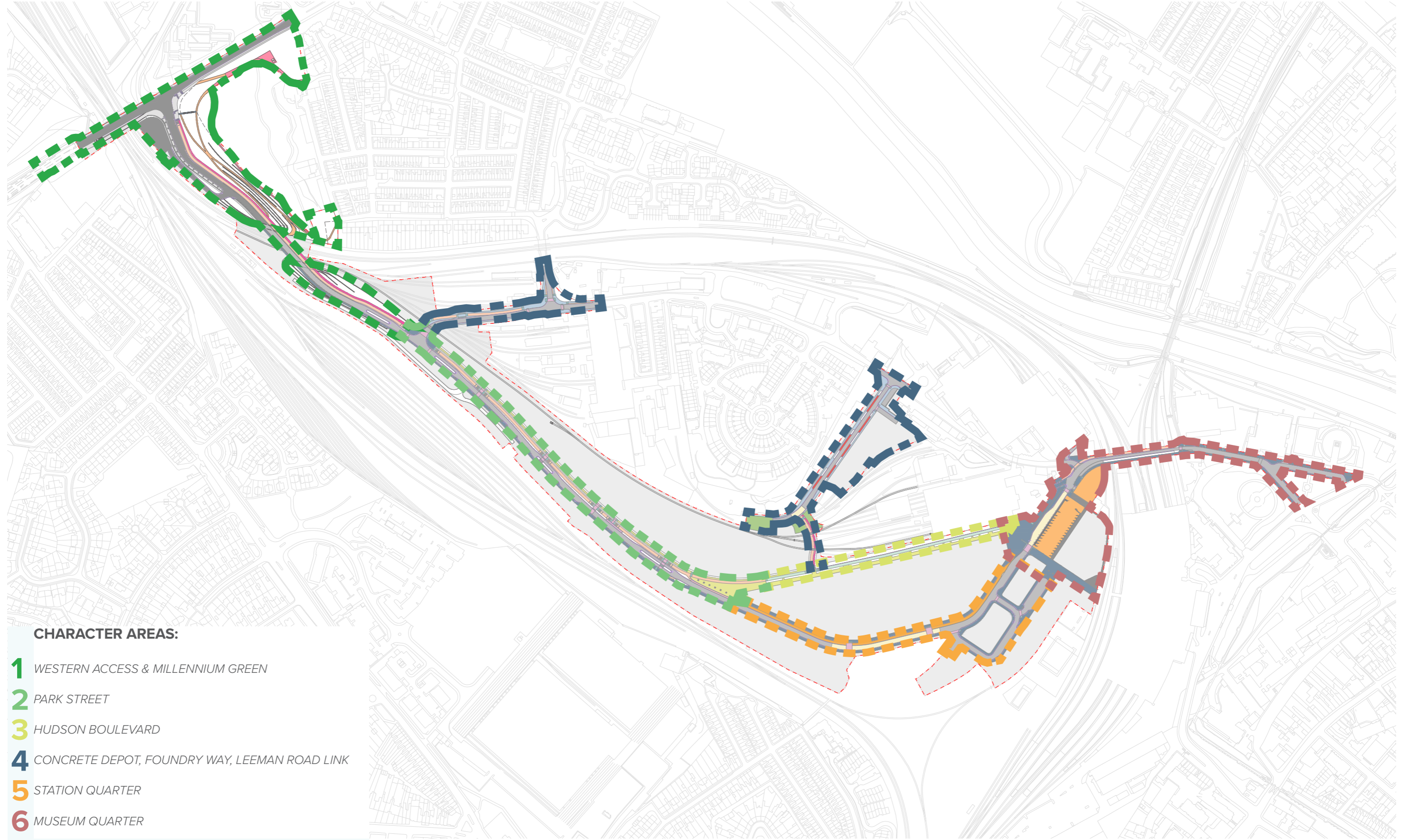
The use of lighting should be limited to areas where it is essential for safety, security or a requirement for movement of vehicles. Trees, scrub and hedgerows should not be lit for aesthetic purposes as this reduces the suitability for roosting, foraging or commuting bats and birds.



Phase 1 infrastructure extent of works

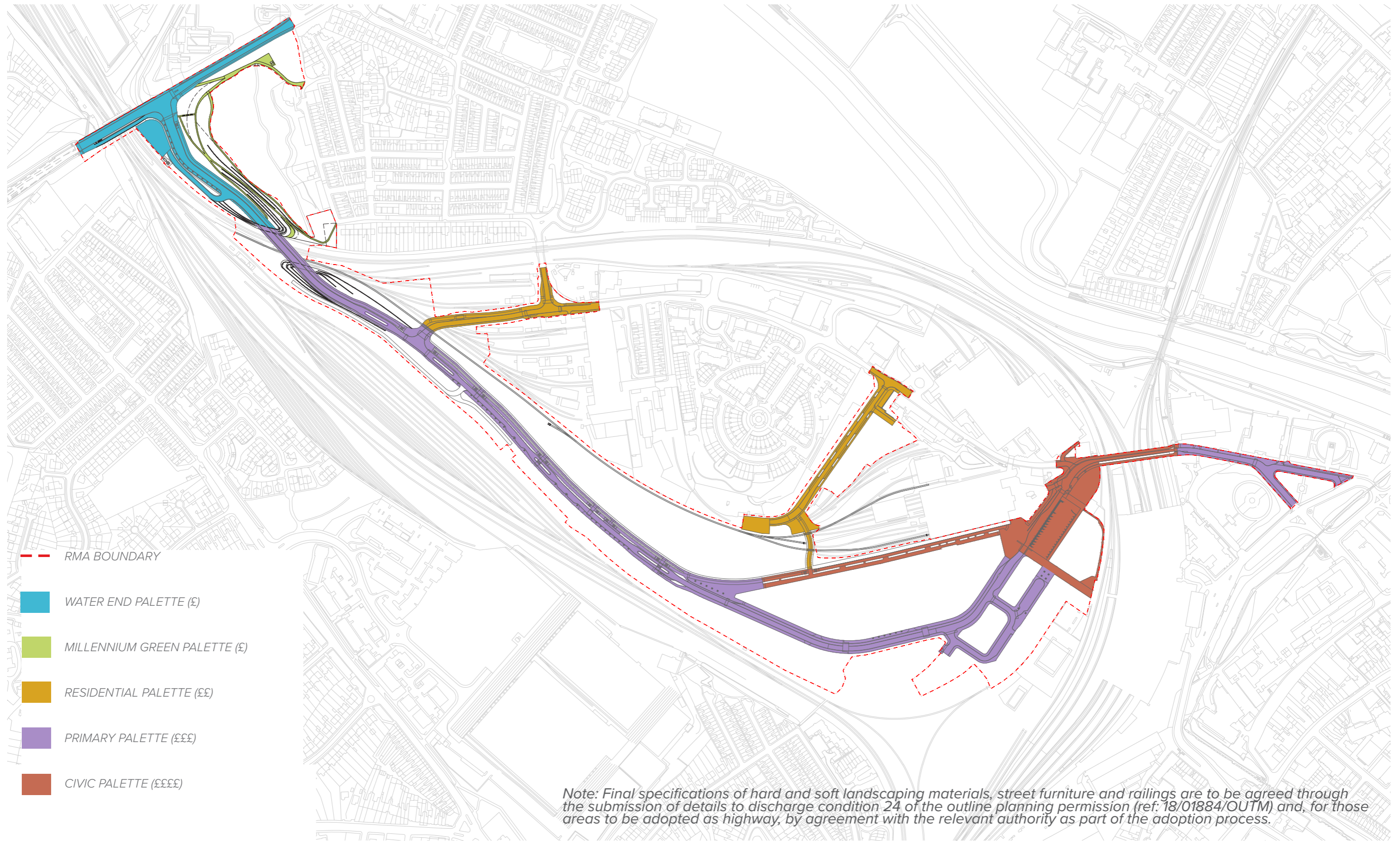
5.2 Character Areas

Western Access & Millennium Green	Park Street	Hudson Boulevard	Concrete Depot, Foundry Way, Leeman Road Link	Station Quarter	Museum Quarter
<p>This character zone contains the primary entrance to the masterplan development and is one of the key areas of the Phase 1 infrastructure works. This Western Access road bridges the existing ECML rail corridor and serves as a significant threshold to the development, both for vehicles and pedestrians/cyclists.</p> <p>The ECML bridge and roadway sit adjacent to an existing protected grassland "Millennium Green." To lessen the impact of the proposed road infrastructure on this natural landscape, a series of planted terraces and sloped meadows will create a natural transition and maintain the existing use of the space for residents and visitors.</p>	<p>Park Street serves as the major spine of the development, with segregated vehicular, cyclist and pedestrian paths running along its extents. This stretch of roadway will act as a pedestrianised edge between the proposed building development and the masterplan's Central Park. As such, the streetscape needs to have a natural character which facilitates permeable yet organised movement, both laterally along the alignment and across the street. The streetscape will feature generous areas of buffer planting and street trees, along with frequent pedestrian crossings.</p>	<p>Hudson Boulevard is the major pedestrian axis of the site, providing a cycleway and footpath link from Park Street to the New Square. It will serve as a transition corridor between these two zones, both spatially and in their materiality. Furthermore, running adjacent to the Railway Museum's "South Yard" and "Station Hall", it needs to respond to the historic industrial context of the adjacent areas.</p>	<p>The character zone labelled the "Concrete Depot" is situated in an area previously used for the industrial production of precast concrete rail elements, such as sleepers, fencing etc. This character zone will respond to this context in its materiality, with a stronger emphasis on the use of precast concrete elements within the streetscape surfacing. This area must respond to adjacent masterplan developments, a significant level change at either end and the access requirements of the Railway Museum. A small square will be located adjacent the NRM south yard, facilitating low loader turning and access for the Museum.</p> <p>A key pedestrian/cycle link within the masterplan is situated at the southern tip of this area. It will provide a permanent all-hours access for residents across the proposed museum rail connection, replacing the existing Leeman road access between Bishopsfield development and Marble Arch.</p>	<p>Cinder Street connects the vehicular corridor of Park Street through to Museum quarter and the Coal Drops. Running through an area bordered by proposed building development, it will serve as a major civic corridor.</p> <p>This stretch of roadway will feature a dedicated bus lane, with cyclist transitioning from a segregated lane onto the carriageway. As such, visual transparency and lowered traffic speed will be prioritised through this corridor.</p>	<p>This character zone will be the focal point of the development. The Railway Museum, Coal Drops and nearby Railway Station, will be major draws for pedestrian, cyclist and vehicular traffic, both locally and regionally. Therefore, the spatial qualities, planting and materiality of this precinct should reflect this significance, allowing for a confluence of traffic and flexible urban activity.</p> <p>However much of the streetscape in this zone will need to respond to the future development of Museum Square and the Coal Drops. As such temporary streetscape provisions will need to be made to ensure that premium materiality isn't utilised in areas requiring sacrificial surfacing.</p>



5.3 Phase 1 Infrastructure Landscape Strategy

5.3.1 Hard Landscape Material Palette



The York Central Design Guide stipulates various zones across the development with varying material palettes. These zones scale in material cost and aesthetic as they approach the New Square and Coal Drops (an area of prominence within the overall masterplan). The intention of this zoning is to create areas within the development with cohesive material character and focus the use of available funds where most appropriate. The materiality utilised within the Phase 1 infrastructure works has taken direction from the design guides and is reflective of the intentions stipulated within the document.

Civic Palette:

“The use of natural stones is strongly recommended (i.e.. Yorkstone, granite, basalt) and should tie into the overall design language of the particular areas in which they are used...It is recommended to use stone setts as paving for the carriageway.”

Primary Palette:

“Materials must allow for a wide range of variation in the size of units or elements, finishes and colours (e.g. in-situ concrete with exposed aggregates, resin bound gravel, tar and chip and bitumen surfacing)... Pavements for heavier vehicular usage, such as carriageways should be paved with hot rolled asphalt (in accordance with the relevant Highway standards) with stone/concrete gutters and kerbs.”

Residential Palette:

Durability and low maintenance shall be a key consideration informing material selection. All materials shall be robust and provide good slip resistance and compressive strength, ensuring they will be appropriate for vehicle trafficked areas as well as pedestrian pavements...Materials shall allow for a wide range of variation in the size of units or elements, finishes and colours (e.g. precast concrete units, resin bound gravel and bitumen surfacing). Pavements for heavier vehicular usage, such as carriageways should be paved with hot rolled asphalt (in accordance with the relevant Highway standards)...Resin bound gravel or coloured asphalt shall be used for the segregated cycleways in order to tie in with the materiality of the park.

Millennium Green Palette:

The Millennium Green palette will incorporate more naturalistic choices to harmonise with the existing materials and character. Materials such as resin bound gravel and self binding gravel will be used. Metal edges will form the edging for footpaths.

Water End Palette:

The Water End Palette will consist of an extension of the CYC highway materials used in the Water End junction to tie in with the existing conditions.

CIVIC

PRIMARY

RESIDENTIAL

MILLENNIUM GREEN

WATER END

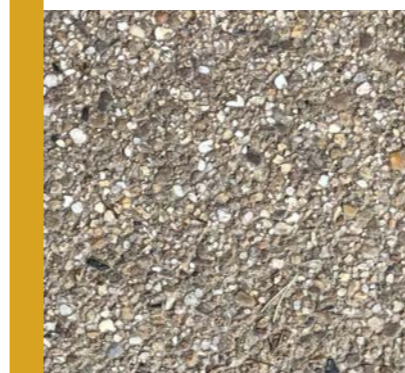
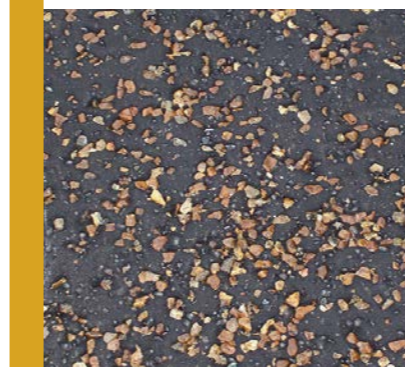
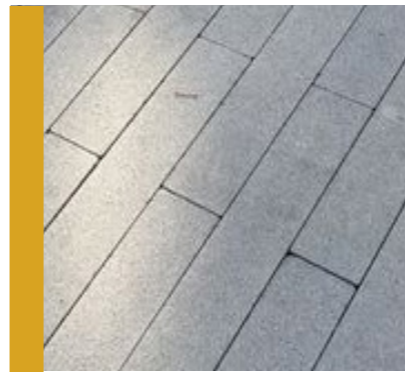
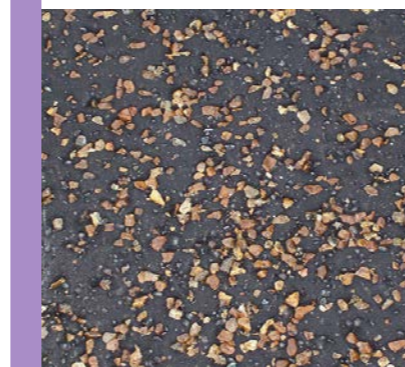
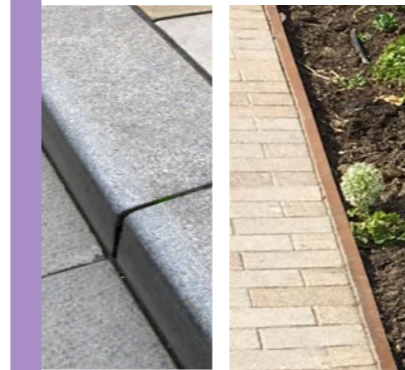
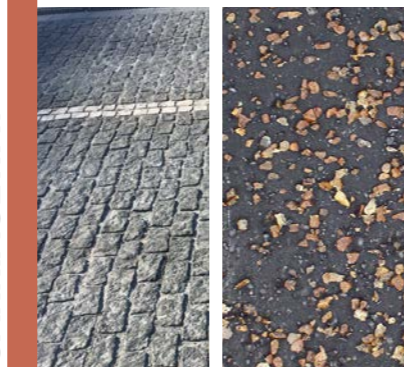
FOOTWAYS

EDGES / DRAINAGE

CARRIAGEWAY

CROSSINGS

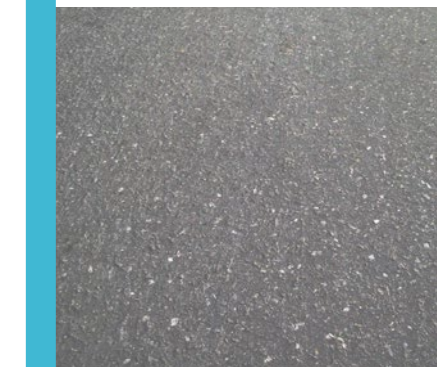
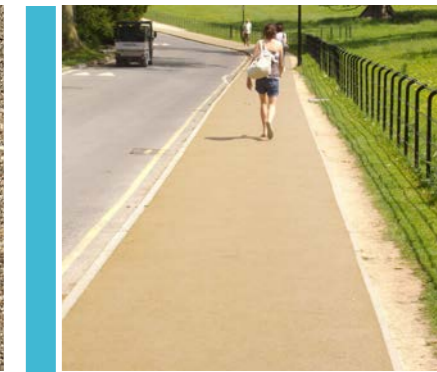
CYCLEWAY



NO CARRIAGEWAY IN MG

NO CROSSINGS IN MG

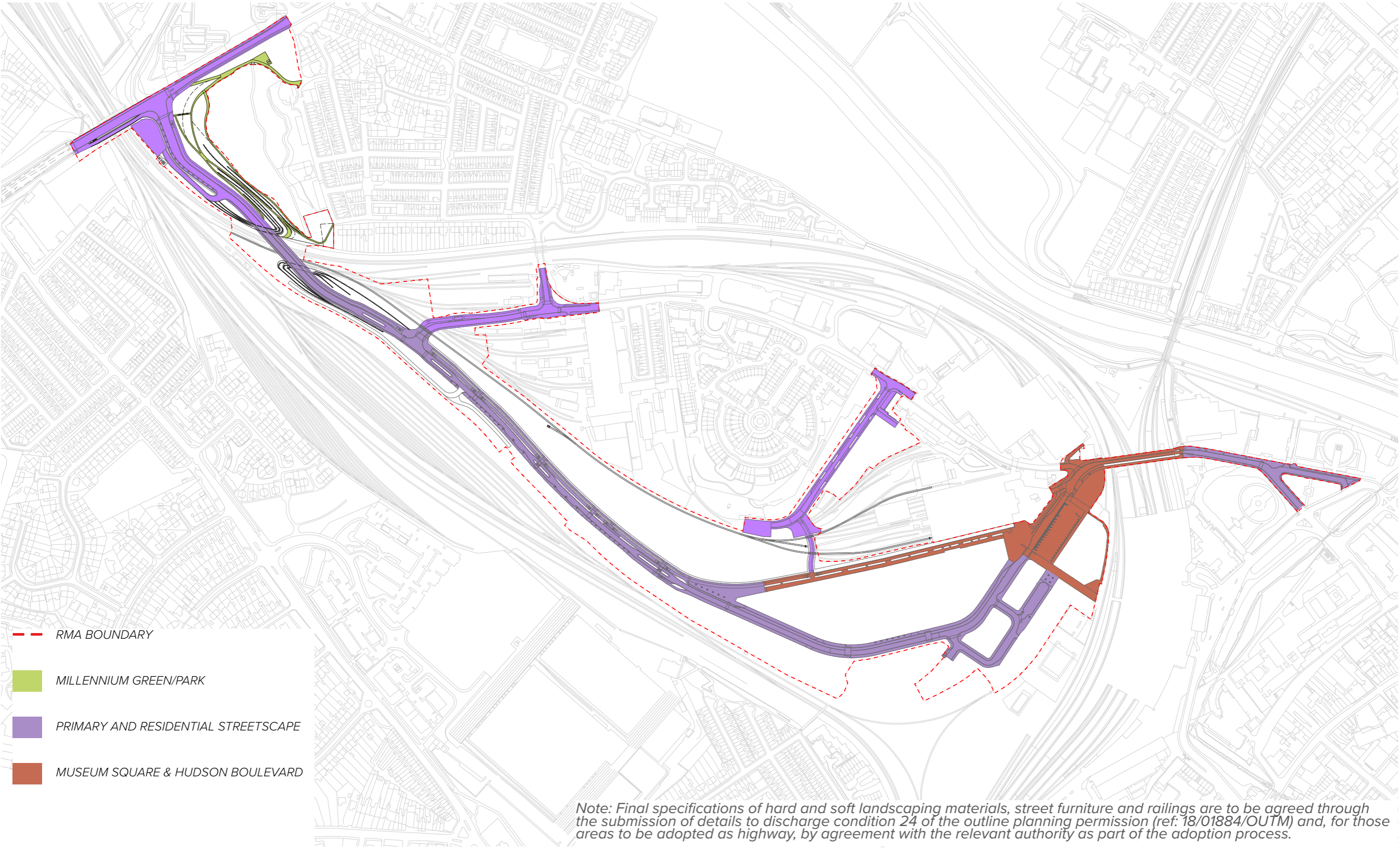
NO CYCLEWAY IN MG



Paving precedent images

5.3 Phase 1 Infrastructure Landscape Strategy

5.3.2 Furniture Palette



Throughout the extents of the Phase 1 infrastructure works, three palettes of streetscape furniture have been identified, relating to the varying landscape contexts of the development. These include “Millennium Green” with a more natural / ecological context, “New Square & Hudson Boulevard” with a more premium, civic context and the “Primary & Residential Streetscape” encompassing the other zones throughout the development generally situated within the Primary and Residential streetscape material palettes.

The Primary & Residential Streetscape areas will utilise a balanced mixture of metal and timber within the furniture materiality. Timber and steel have been selected to reflect the historic industrial & rail context of the masterplan site. These materials are commonly used in streetscape furniture and are suitably durable for the exposed location and frequency of use. Timber benches will be set into the planting areas so as not to obstruct movement along the pedestrian corridors. These benches will be regularly situated along the road alignment but be more concentrated adjacent to pedestrian crossings, bus stops etc. Waste disposal units will be regularly located along the road alignment to discourage litter. Several cycle racks will be positioned at the north-western tip of the Western Access road at a key entrance to the development.

In the New Square / Coal Drops and along Hudson Boulevard the materiality of the furniture will transition to reflect the more civic context of these areas. Wooden elements will feature less, with steel and precast concrete elements becoming more prominent. Bench seating will be positioned in the planting strip along Hudson Boulevard, again to prevent the obstruction of cyclists / pedestrians. Waste disposal units will also be regularly located. Steel bollards will be situated adjacent to pedestrian crossings to prevent vehicle access across the drop kerbs. Cycle racks will also be located to allow for bicycle parking at key locations within the development.

Finally, within Millennium Green and Park the furniture will primarily consist of timber to reflect the more natural / ecological context of the grassland area. Robust timber benches will be provided at the base of the embankment to provide rest areas for visitors. Balustrade fences, protecting pedestrians from steep embankments, will be set back into dense planting and visually recede into the landscaped areas. Bollards at the edges of the green’s pathways will prevent vehicle access. Furthermore, timber bird boxes and insect habitats will be strategically located throughout Millennium Green to assist in meeting ecological benchmarks and improve the overall natural health and biodiversity of the grassland / embankment.

New Square & Hudson Boulevard Furniture Palette



Primary & Residential Streetscape Furniture Palette

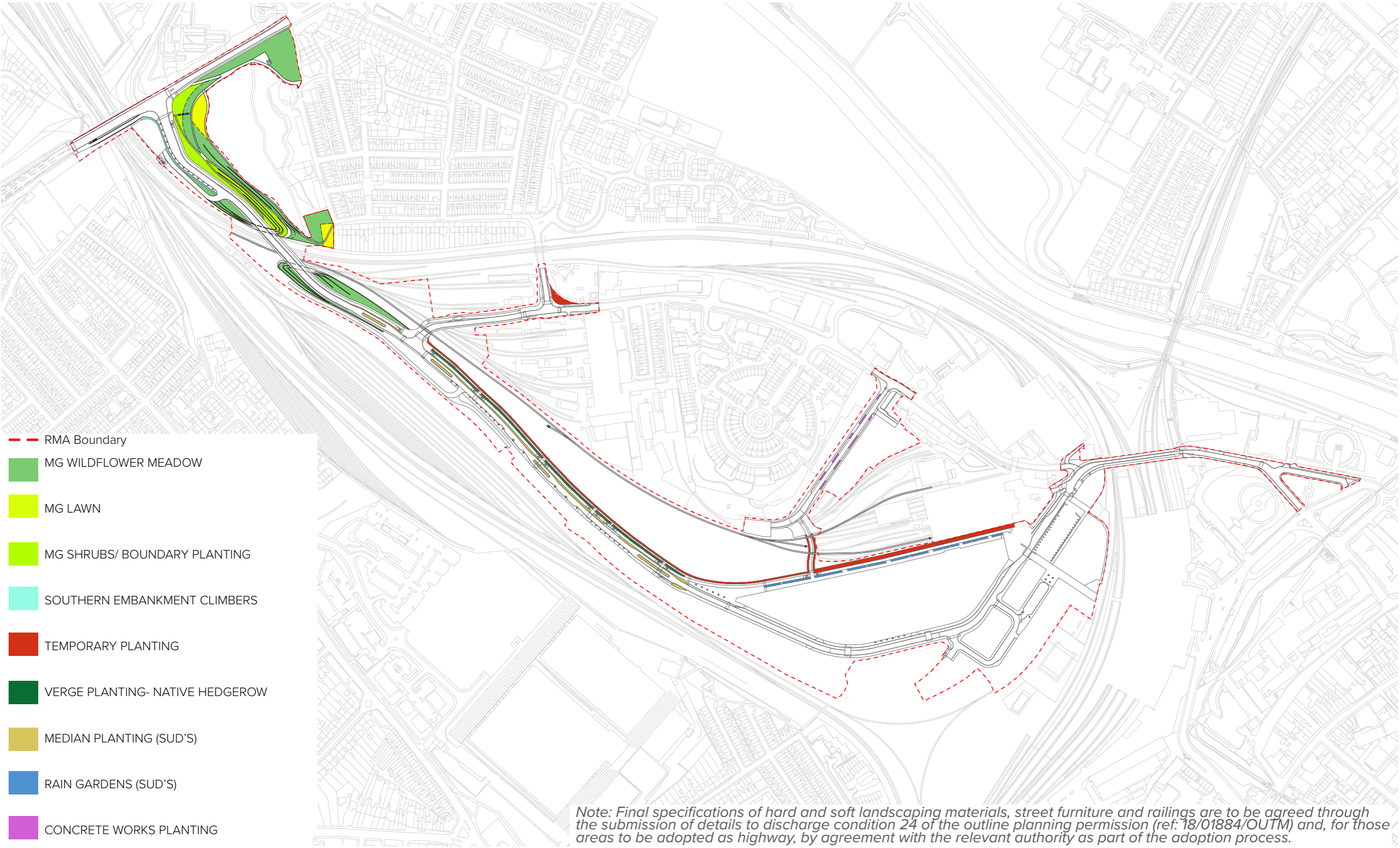


Millennium Green/Park Furniture Palette



5.3 Phase 1 Infrastructure Landscape Strategy

5.3.3 Planting Character Areas



The planting strategy for York Central sets out variety of character areas and habitats that range from wetland, which form part of the storm water attenuation strategy, to brownfield areas that provide important habitats for invertebrates. The planting character transitions from a predominantly native palette in the western end of the park to more ornamental and species-rich lawns on the eastern end.

The York Central planting strategy comprises the following planting typologies:

Millennium Green habitat area:

The planting strategy seeks to protect and enhance the site's ecological value and mitigate the impact of new access to York Central. Refined, planted embankments and meadow spaces provide a mosaic of ecological habitats along the Holgate Beck linking to those throughout the parkland of York Central.

- **Shrub/ boundary buffer planting:**
Buffer areas comprise smaller trees and specimen shrubs, climbing plants on screens as well as a palette of flowering shrubs, perennials and grasses.
- **Wildflower meadow:**
Slopes will be covered with wildflower meadows rich in colour and texture as well as providing excellent habitats for wildlife.
- **Lawn area:**
Lawn amenity areas will provide soft play spaces.

Rain garden (SUD's)

The SUDS planting palette will comprise species that are able to withstand brief periods of standing water yet are able to tolerate extended periods of dryness. Also included will be species that attract pollinators and provide seasonal interest.

Median and verge planting:

Median and verge planting will consist of robust planting, which will be suitable for saline environments, due to their location adjacent to road surfacing. The planting will create a visual buffer between the roads, the cycle ways and the footpaths.

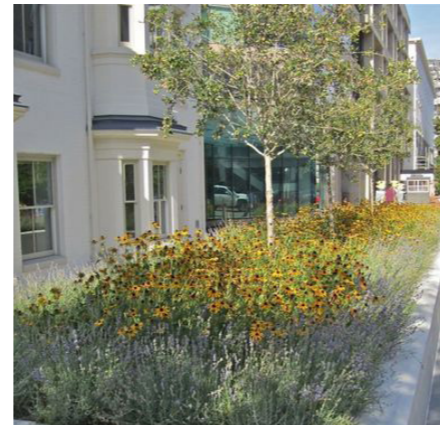
Temporary planting:

Temporary planting will consist primarily of seeded meadows. The areas will create a visual break/barrier/backdrop between the footpaths and the hoarding/future development and increase biodiversity along the strips where they are planted.

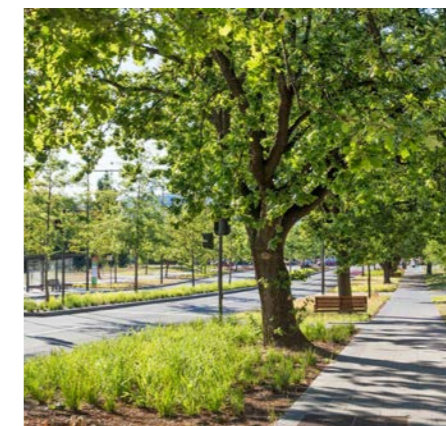
Millennium Green habitat area / Embankment planting:



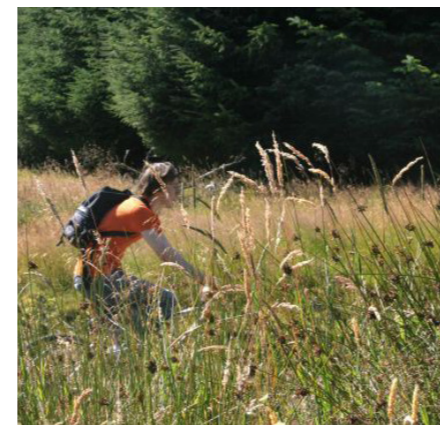
Rain gardens



Median and verge planting

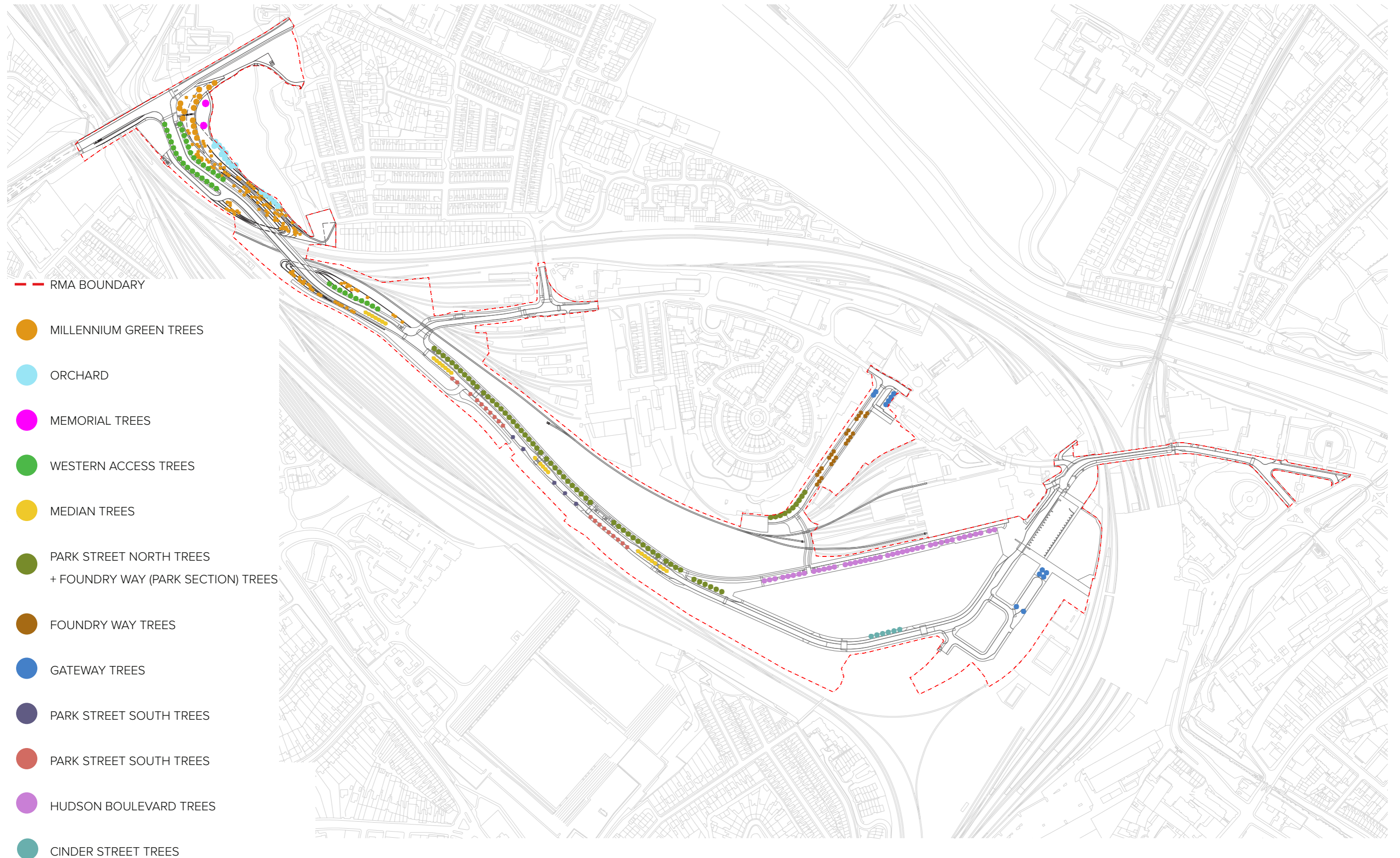


Temporary planting



5.3 Phase 1 Infrastructure Landscape Strategy

5.3.4 Tree Planting



--- RMA BOUNDARY

● MILLENNIUM GREEN TREES

● ORCHARD

● MEMORIAL TREES

● WESTERN ACCESS TREES

● MEDIAN TREES

● PARK STREET NORTH TREES
+ FOUNDRY WAY (PARK SECTION) TREES

● FOUNDRY WAY TREES

● GATEWAY TREES

● PARK STREET SOUTH TREES

● PARK STREET SOUTH TREES

● HUDSON BOULEVARD TREES

● CINDER STREET TREES

Tree species will be selected to provide seasonal interest, shade, colour, texture and form appropriate to their context. They will also be used to contribute to breaking down the scale of the development whilst still responding to the scale of the architecture along the streets.

The street tree planting strategy seeks to reinforce the different character areas along the Park Street (spine road) as well as offer a sense of naturalistic informality throughout the York Central development. This is achieved through the following tree planting typologies:

Wet woodland - The woodland reflects the valley character, with upper valley species such as Silver Birch (*Betula pendula*) adjacent to the main road, grading down to riparian species such as Common Alder, Aspen and Willow.

Dry woodland - This type of planting evokes the character of the native lowland woods dominated by mixtures of oak, ash and hazel with diverse understory that provides a rich flower display.

Green buffer tree planting - Buffer planting is proposed to protect the development site from noise and ensure favourable views. Natural groupings of multi-stemmed flowering trees, such as *Corylus avellana* and *Betula pubescens* will populate these areas.

Foundry Way - This area will comprise smaller, more domestic-scaled trees selected for form, autumn foliage and spring flowers (e.g. *Carpinus betulus*, *Prunus avium*).

Commercial District squares + Park Plaza – The trees in this area will punctuate the landscape experience of the streetscape and internal views within the development. They should provide seasonal accents as flowering in spring and summer or eye-catching leaf colour in autumn.

Park Street and Hudson Boulevard – These streets are to have large clear stem trees (e.g. *Tilia cordata*, *Acer pseudoplatanus*), bordering the wide paved walkway and providing a leafy avenue that leads to the New Square.

New Square – The New Square will feature more ornamental trees, such as *Ginkgo biloba* or *Liquidambar styraciflua*, providing a varied seasonal interest to this key pedestrian hub and framing the social and events space.



Corylus avellana



Malus sp.



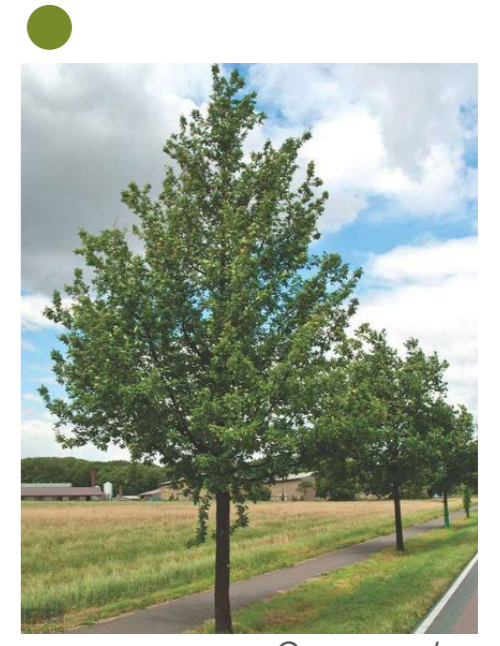
Quercus robur



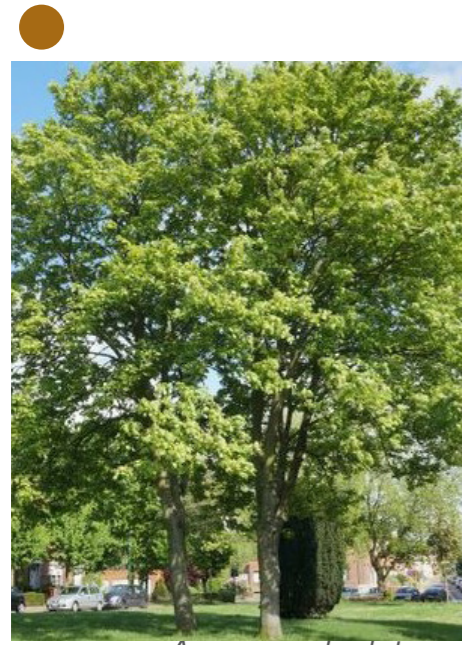
Tilia cordata



Prunus avium



Quercus robur



Acer pseudoplatanus



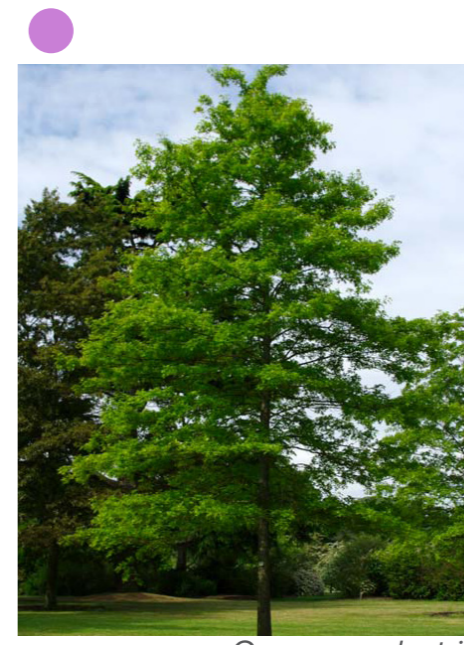
Liquidambar styraciflua



Prunus padus



Acer Campestre



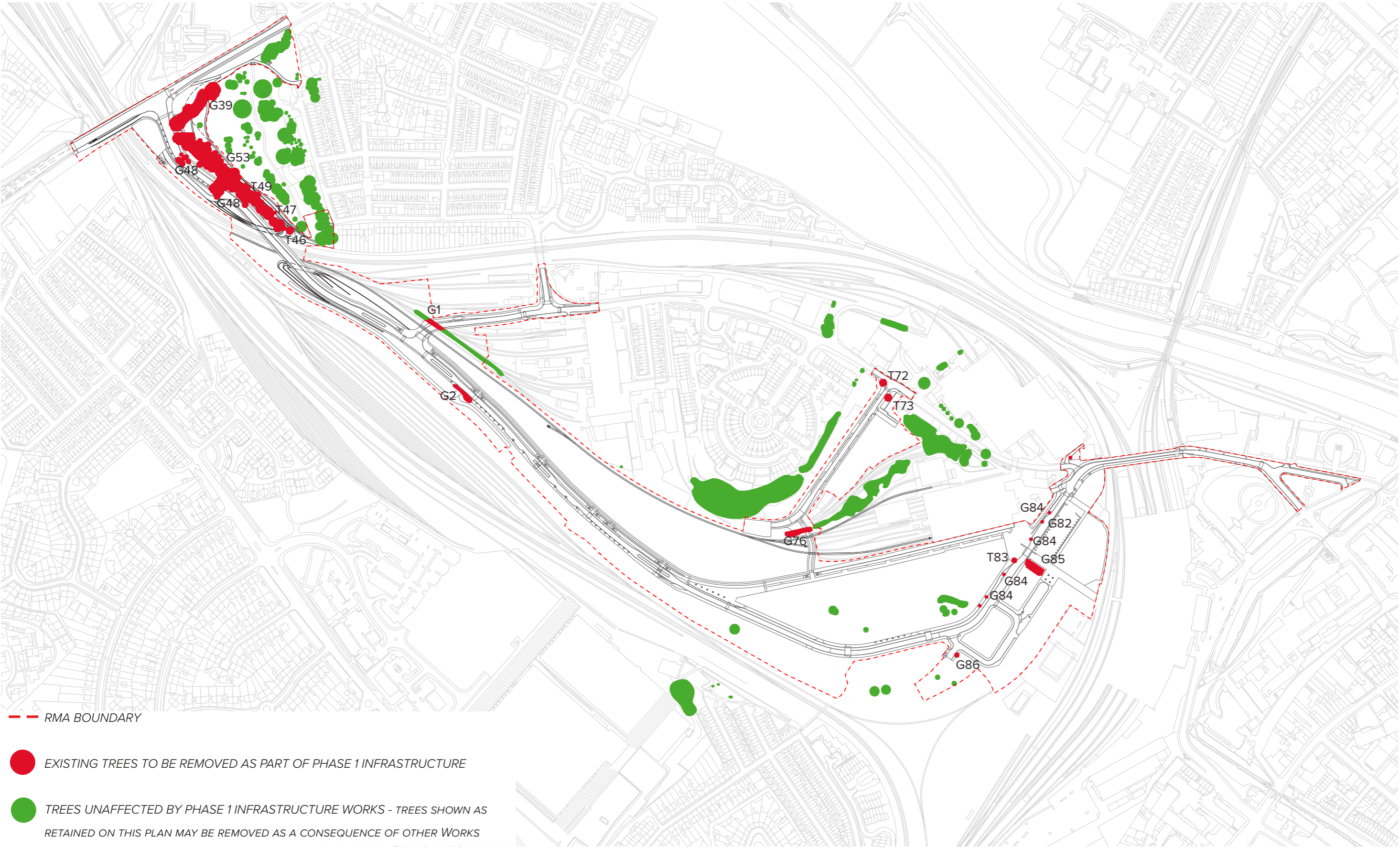
Quercus palustris



Liriodendron tulipifera

5.3 Phase 1 Infrastructure Landscape Strategy

5.3.5 Existing trees to be retained and removed



A tree survey was carried out by JCA arboricultural and ecological consultants identifying the trees within and surrounding the site. The majority of the trees are located within Millennium Green, the remainder of the site does not contain many trees due to the industrial nature of the site.

G39 is a mixed species, semi-mature group of trees that will be removed as part of the phase 1 works. The proposals aim to mitigate this loss with new tree planting. Trees of significance such as the 'Millennium Oak', which carry emotional significance within the community will be protected. This includes replanting a tree classified as part of G53, which was planted by the community in remembrance of a past member of the Trustees.

T46, T47, T49 will all be removed all of which are young semi mature trees with a retention category C. This loss will again be mitigated through proposed tree planting and ecological habitat creation.

G1 a mixture of young species will be partly removed to allow for access toward Kingsland Terrace.

G2 and G3 a group of young *Salix caprea* will be removed.

T72 and T73 both with retention category B will be removed to allow for future connection through Concrete Works. G76 will be removed to allow for connection towards Hudson Boulevard. These will be mitigated with a number of proposed trees along the length of the Concrete Works connection.

G82, G84, G85 and T83 will all be removed to allow for the level change along Cinder Street and Coal Drops. G82 has been classified as retention category U with remainder being Category B. The future works within the Coal Drops and Museum Square allow for a number of proposed trees that will mitigate the above mentioned removal.

Technical information: Trees to be Removed

Tree to be removed	Species	Retention category
G39	Mixed, semi mature to early mature	B2
G48	Mixed, young to early mature	A
T46	<i>Corylus avellana</i> (Hazel), semi mature	C1
T47	<i>Aesculus hippocastanum</i> (Horse Chestnut), young	C1
T49	<i>Fraxinus excelsior</i> (Ash)	C2
G1 (Part of)	Mixed, young	C2
G2	<i>Salix caprea</i> (Goat willow) Young	C2
G3	<i>Salix caprea</i> (Goat willow) Young	C2
T72	Not recorded	B1
T73	<i>Betula pendula</i> (Silver birch), early mature	B1
G76	Mixed, semi mature	C2
G82	Mixed, semi mature	U
G84	Mixed, semi mature	B2
G85	<i>Robinia pseudoacacia</i> , early mature	B2
T83	<i>Robinia pseudoacacia</i> , early mature	B1
G86	<i>Acer pseudoplatanus</i>	B2



Millennium Oak - to be retained



G39 Millennium Green Mixed species - to be removed



Typical growth adjacent to railway



G84 Trees along Cinder Lane to be removed

5.3 Phase 1 Infrastructure Landscape Strategy

5.3.6 Meanwhile Use and Additional Landscape

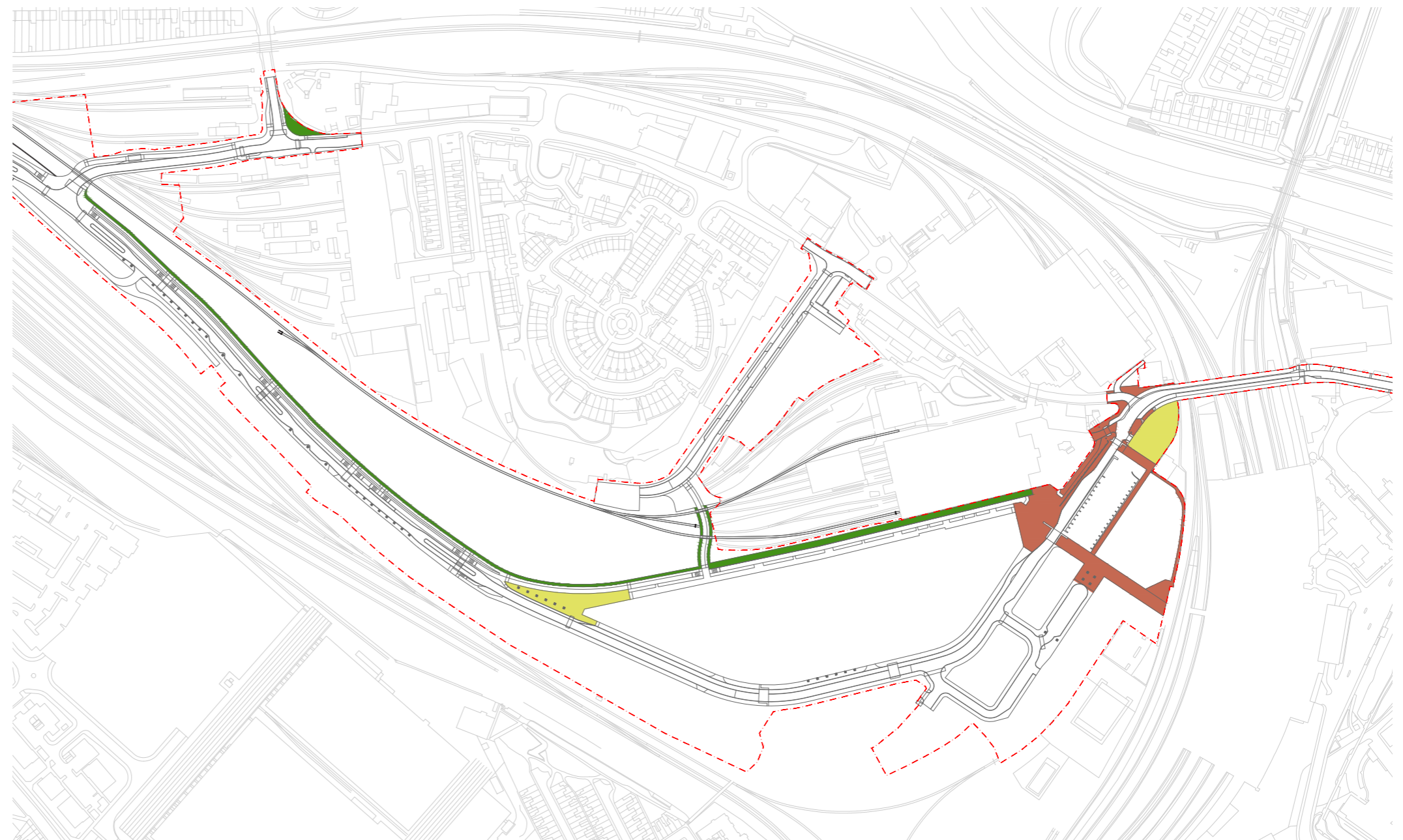
A new square will be created at the National Railway Museum entrance. This square will link the pedestrian and cycle routes on Hudson Boulevard, Cinder Street and will connect to the western railway station entrance. The square will guide visitors towards the museum entrance. It is important that as a focal point of the site and the entrance from the train station and city centre that the material palette is suitable both in durability characteristics and aesthetic. High quality materials are used to highlight the importance of this area on the overall scheme and consist of high quality visible aggregate concrete pavers.

Future reserved matters application will be submitted for the redevelopment of the National Railway Museum and Museum Square. The pavement materials installed in this Phase 1 Infrastructure RMA may be replaced by a materials consistent with the landscape proposals for the Museum Square.

The use of temporary planting along Hudson boulevard will create a buffer from the national railway museum and soften the interface between the public realm and railway lines. It creates a soft backdrop to this civic space and reduce the impact of the hoarding line on the space.

Temporary planting is also used along the entirety of park street softening the hoarding that will be in place along the future park corridor. This strip of soft landscape will be primarily seeded meadow, which is a low cost planting option that gives maximum biodiversity and visual impact.

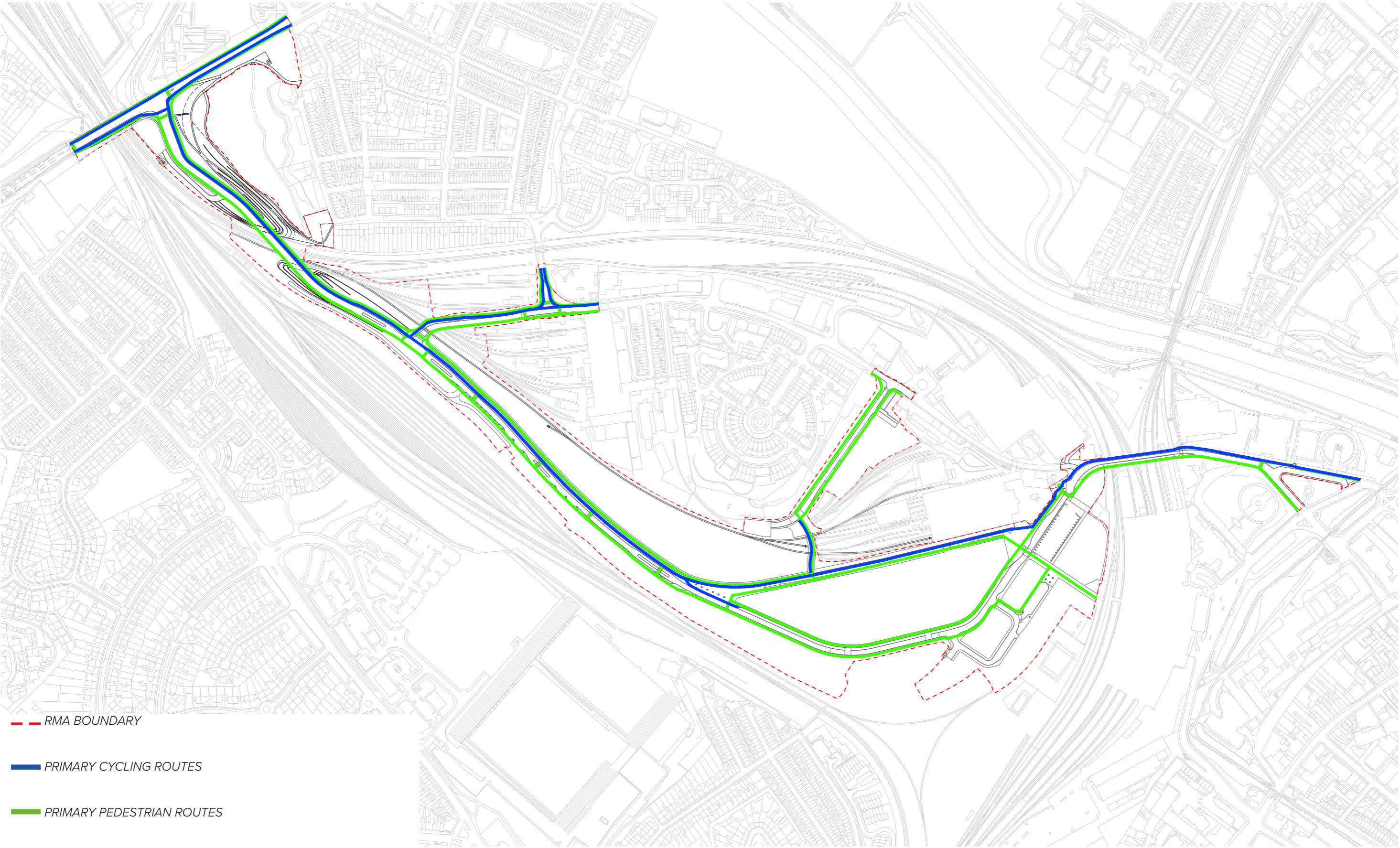
Temporary resin bound gravel will be used at the interface between Hudson Boulevard and Park Street to facilitate the future development.



- - - RMA BOUNDARY
- MEANWHILE USE
- MEANWHILE USE - HIGH QUALITY MATERIALS TO BE REUSED AT A LATER DATE
- TEMPORARY PLANTING

5.3 Phase 1 Infrastructure Landscape Strategy

5.3.7 Primary Pedestrian and Cycling Routes

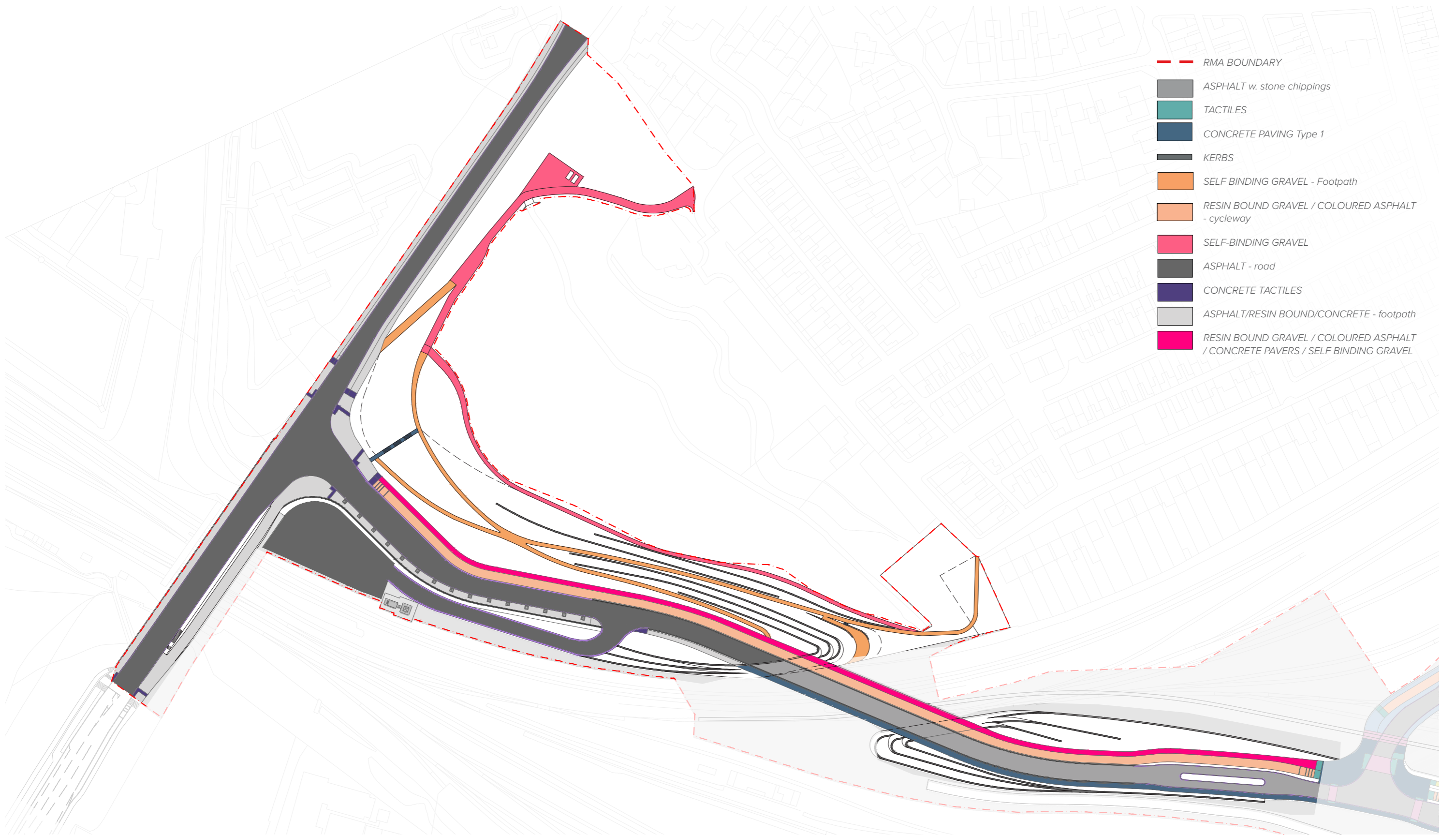


5.4 Detailed Character Areas

- 5.4.1 Western Access & Millennium Green
- 5.4.2 Park Street
- 5.4.3 Hudson Boulevard
- 5.4.4 Station Quarter
- 5.4.5 Museum Quarter
- 5.4.6 Concrete Depot, Foundry Way and Leeman Road Link

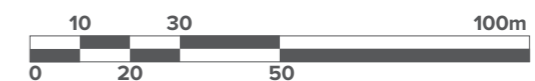
5.4 Detailed Character Areas

5.4.1 Western Access & Millennium Green - Hard Landscape Palette



Illustrative Material Diagram

PHASE 1 INFRASTRUCTURE RMA - DESIGN REPORT | APRIL 2020



SCALE 1:1500 PAGE 46

Materials Strategy

The Western Access is the most westerly stretch of the Phase 1 infrastructure and includes the materials selection of the Water End and Primary palette.

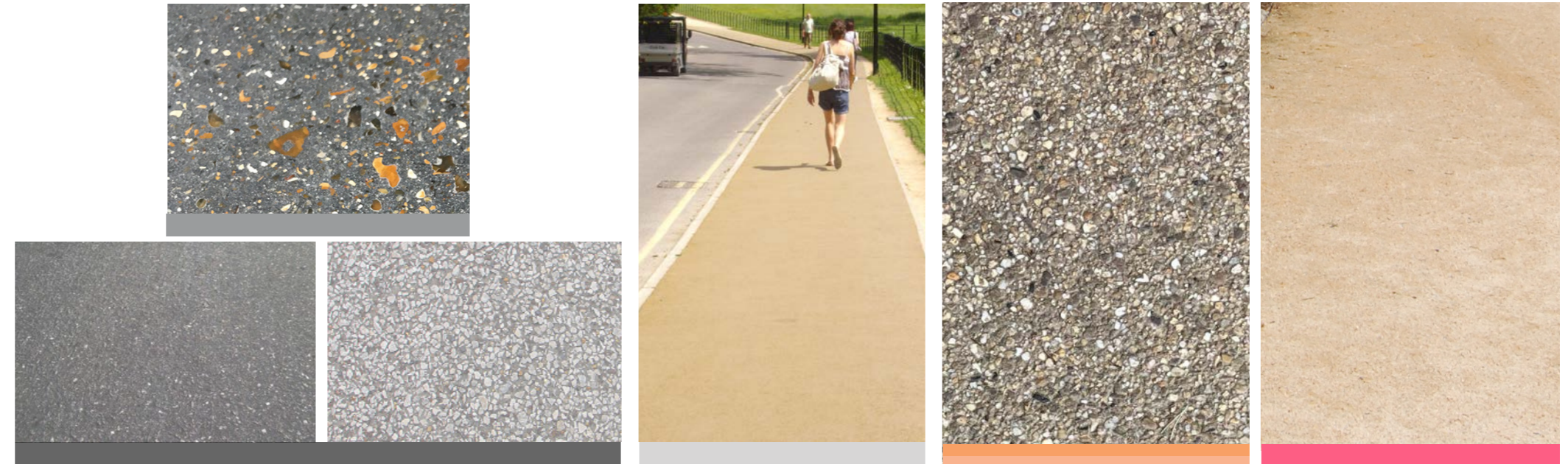
These materials include the stone or concrete kerbs lining the roadways along with the stone or concrete setts at the pedestrian crossings.

Precast concrete pavers or Resin bound gravel or Asphalt will be used as a cost-effective solution to pave the pedestrian walkways. If Precast concrete pavers are used they will include a natural stone aggregate to raise the material quality slightly and connect the materiality of the pavers with the overall material aesthetic of the development. If resin bound surfaces are created the aggregate used will harmonise with the park material palette, thus reducing the visual difference between the spaces. The asphalt option would be as per the council specification.

Resin bound gravel or coloured asphalt will be utilised on the cycle path providing a distinct materiality change from the pedestrian footpaths, signifying their separate uses. If resin bound gravel is used, this will provide a durable surface for cycle travel, and has been utilised in multiple London schemes. Furthermore, the material aesthetic of the gravel is more natural, compared to the alternatives (Tarmac) and is reminiscent of the material tones of York stone paving. This path will be lined either side with steel edging.

The surfacing used for the roadway, will be a traditional asphalt paving. However, once again to improve the material quality of surface, natural stone chippings will be scattered into the mix when laid. These chippings will have buff sandstone character, similar to the precast pavers.

Within Millennium Green itself, the paths will be lined with a resin bound gravel, similar to that used on the cycleways, using a slightly larger gravel aggregate. This will be an appropriate material finish for the natural context of these proposed pathways. The existing pathway at the base of the Millennium Green terraces, will be slightly re-aligned and repaved with a crushed self-binding gravel, as per the existing condition.



Overall Materials Palette



Precedent image of embankment planting



Precedent image of pedestrian footways/cycleways

5.4 Detailed Character Areas

5.4.1 Western Access & Millennium Green

Materials Strategy - Cycleway Option: Resin bound

The following pages explain the advantages of using resin bound and resin bonded gravel which informed our selection of materials. for the cycleway.

Resin bound and Resin bonded are two different material specifications

- Resin bound is regularly used on urban footpaths and cycleways
- Creates more even, durable surface finish (wheelchair and cycle friendly)
- In line with Design Guide

Technical Information:

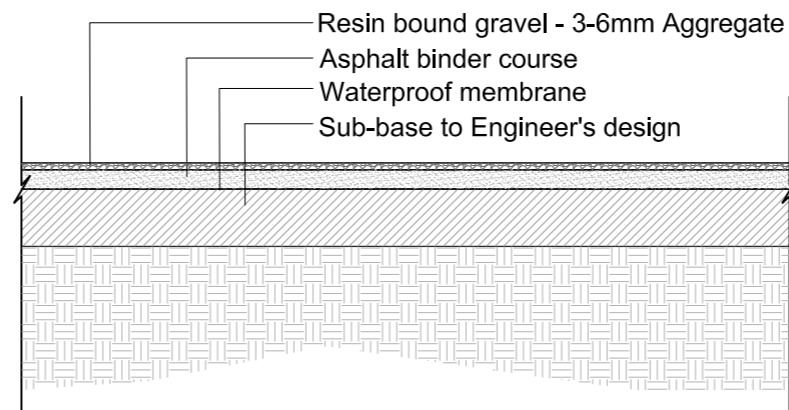
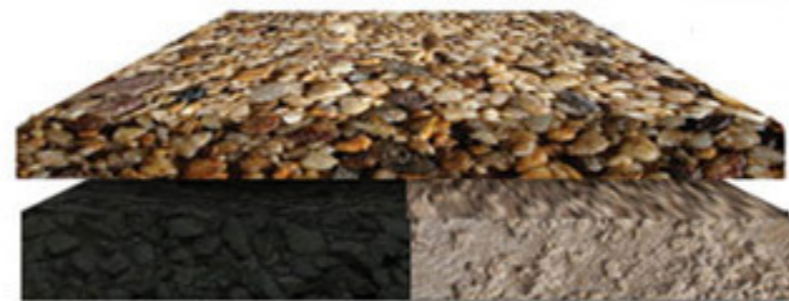
Surface		Size	Colour/finish	Unpolished slip/skid resistance (SRV) (BS >40)	Aggregate resistance (Guidance <23)
Resin Bound Gravel	Addagrip	3-6mm Aggregate	Peanut or similar	51	3.3

SUMMARY COMPARISON TABLE:

SURFACE	ADVANTAGES	DISADVANTAGES	MAINTENANCE
RESIN BOUND GRAVEL	<ul style="list-style-type: none"> - Robust and Durable - Wheelchair friendly - Less maintenance and replacement required 	<ul style="list-style-type: none"> - Slightly Higher cost to install 	<ul style="list-style-type: none"> - Lower maintenance cost due to durability - 15 -25 yr guarantee
RESIN BONDED GRAVEL	<ul style="list-style-type: none"> - Cheap to install 	<ul style="list-style-type: none"> - High maintenance due to fast surface wear - Repair often causes low quality 'patchwork' effect - Not free draining 	<ul style="list-style-type: none"> - High maintenance requirements, especially in high use areas.

Maintenance:

- 15 - 25 year Guarantee (when installed by specialist)
- Cleaning: Swept clean with a stiff broom to remove leaves and other detritus; more heavily soiled areas may require hosing with clean water and detergent.
- Replacement (if required): Small areas of damage can be repaired by carefully removing a small patch of the affected surface and replacing it with the same blend as the original. Blends with age.
- Frost: The removal of ice or frost from the surface can be achieved by the application of rock salt.

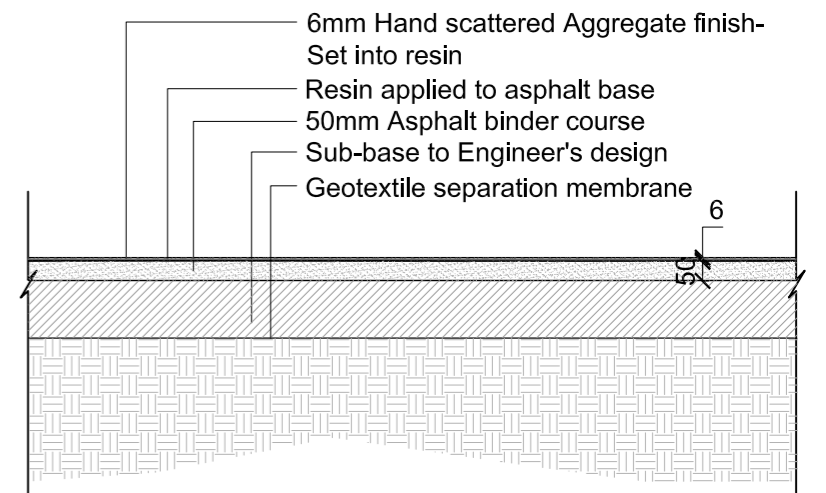
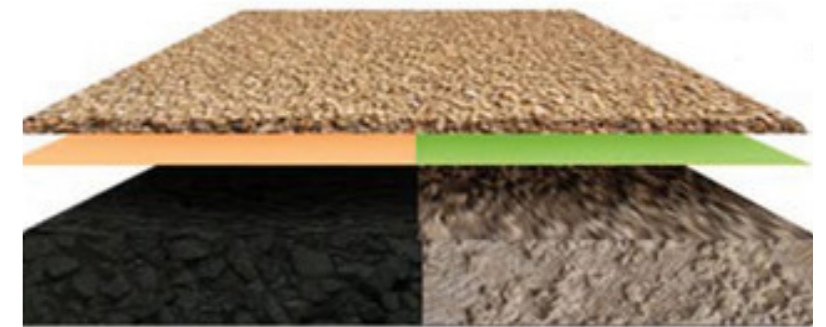


Resin bound gravel paving build up

Vs.



Vs.



Resin bonded gravel paving build up



Different selection of aggregates and colours



Precedent image of resin bound gravel: Battersea Park, London



Precedent image of resin bound gravel: Queen Elizabeth Olympic Park London



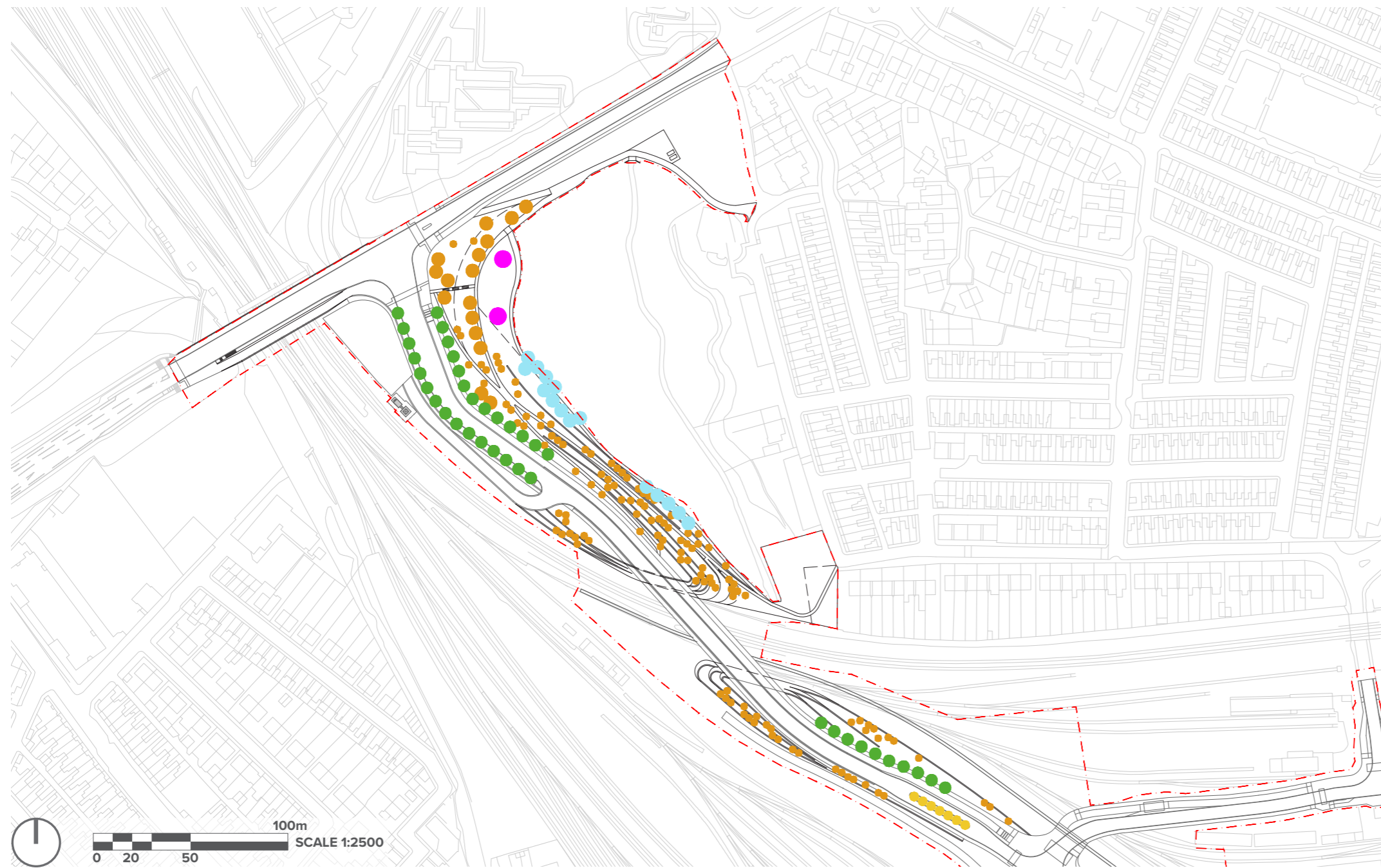
Precedent image of resin bound gravel: Constitution Hill- East to West Cycle Superhighway



Precedent image of resin bound gravel: Constitution Hill- East to West Cycle Superhighway

5.4 Detailed Character Areas

5.4.1 Western Access & Millennium Green



- - - RMA BOUNDARY
- + ORCHARD (e.g. *Malus* sp., *Prunus avium*, *Pyrus* sp, *Prunus domestica*, *Cydonia oblonga*)
- + MEMORIAL TRESS
- + MILLENNIUM GREEN EMBANKMENT TREES (e.g. *Corylus avellana*_multi stem, *Betula pendula*_ multi stem, *Malus sylvestris*, *Sorbus aucuparia*, *Carpinus betulus*, *Acer campestre*)
- + WESTERN ACCESS TREES (e.g. *Tilia cordata*, *Carpinus betulus*)
- + CENTRAL MEDIAN TREES (e.g. *Prunus padus*, *Prunus avium*, *Prunus serrulata*, *Betula pubescens*, *Pyrus calleryana*)

Planting strategy

This drawing shows the planting strategy and the vegetative character of the different areas.

The planting strategy sets out the broad principles for the different site characters, which aim to enhance the sites ecology and mitigate the impact of new access to York Central. This strategy generates different planting characters which, when combined, will create a unique sense of place.

The planting strategy for the Millennium Green sets out an approach consisting of proposed tree planting, mixed woodlands, meadows and lawns. This defines a series of highly refined embankment spaces, creating a mosaic of ecological habitats along the Holgate Beck and throughout the parkland of York Central.



Malus sp.



Pyrus calleryana



Coryllus avellana



Betula pendula



0 20 50 100m SCALE 1:2500

- RMA BOUNDARY
- MG WILDFLOWER MEADOW
- MG LAWN
- MG SHRUB BOUNDARY PLANTING (e.g. *Crataegus monogyna*, *Prunus spinosa*, *Malus sylvestris*, *Carpinus betulus*)
- SOUTHERN GREEN WALL (Climbers: *Jasminum officinale*, *Hedera helix*, *Lonicera periclymenum*, *Hydrangea anomala*)
- VERGE PLANTING (e.g *Sambucus nigra*, *Viburnum lantana*, *Viburnum opulus*, *Rhamnus cathartica*, *Rosa canina*, *Cornus sanguinea*)
- MEDIAN PLANTING (e.g. *Deschampsia cespitosa*, *Pennisetum alopecuroides*, *Miscanthus sinensis* 'Little Kitten', *Armeria maritima*, *Helichrysum italicum*, *Achillea filipendulina*)
- TEMPORARY PLANTING (wildflower meadow)



Wildflower meadow



Rhamnus cathartica



Viburnum lantana



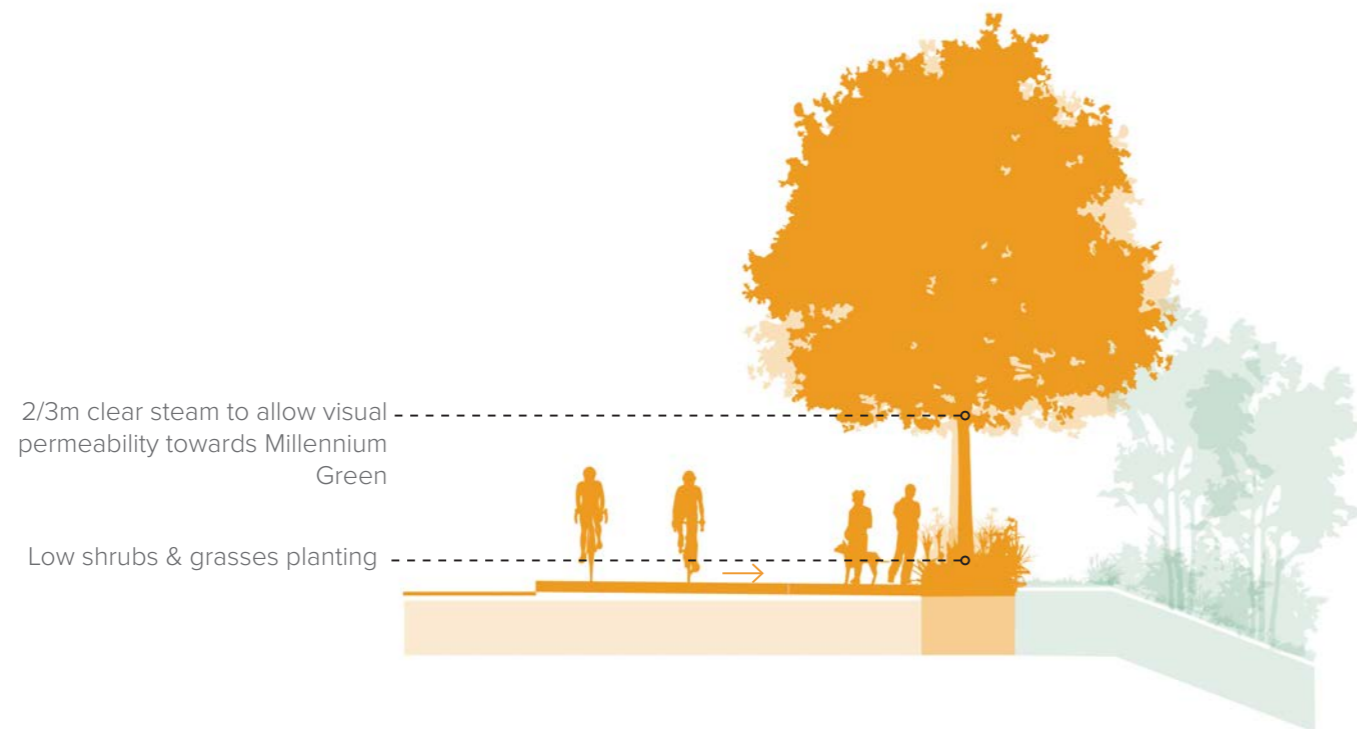
Jasminum officinale



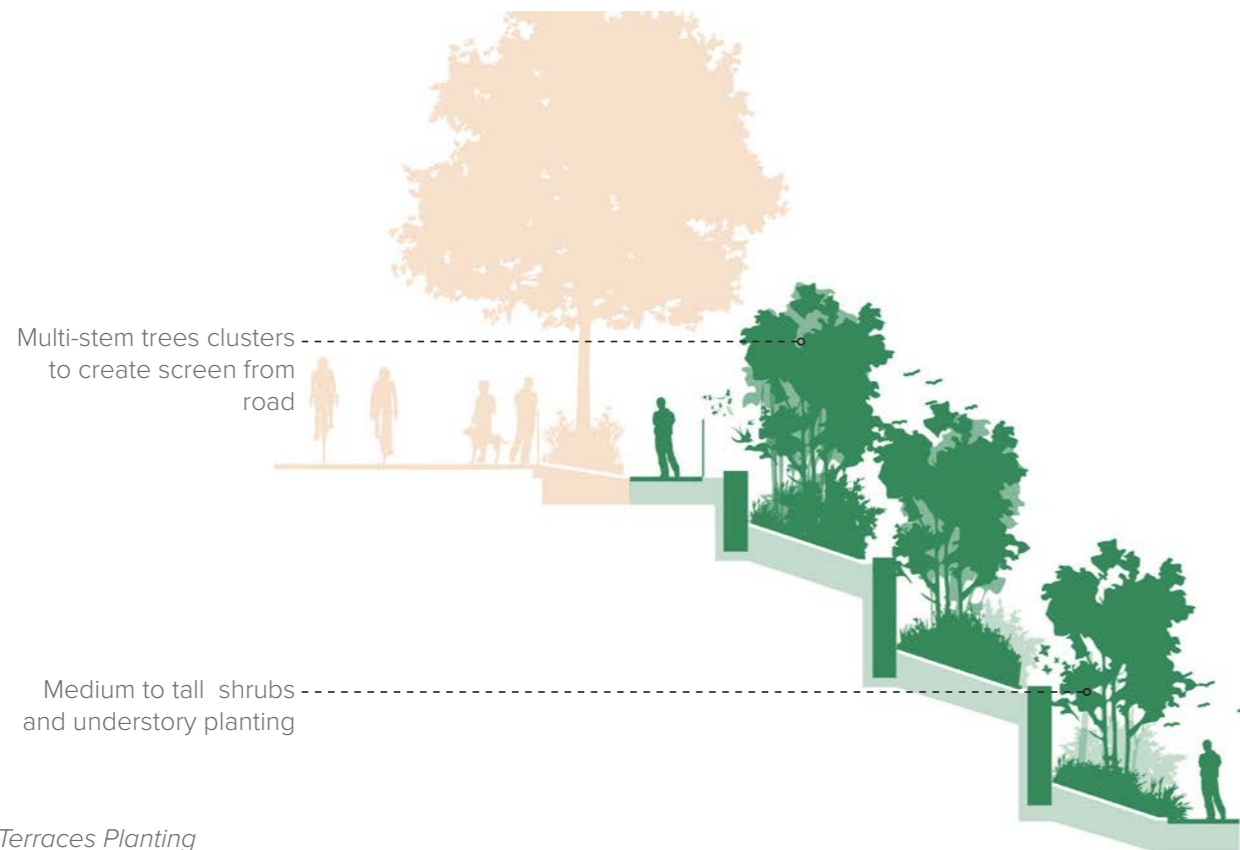
Malus sylvestris

5.4 Detailed Character Areas

5.4.1 Western Access & Millennium Green



Planting adjacent to roadway

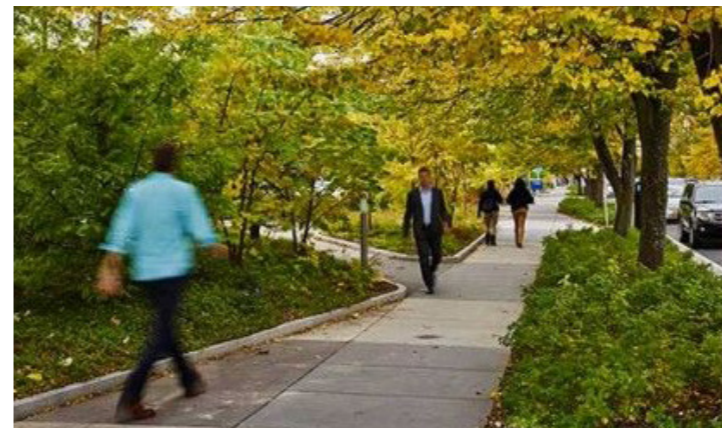


Terraces Planting



The planting character of this area develops in continuity with the wider York Central public realm scheme.

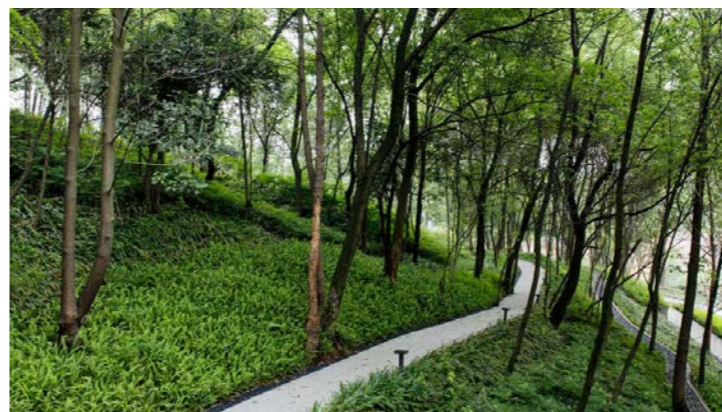
A buffer spine of trees and low shrubs/grasses separates the cycle route from pedestrian footway. This provides a more protected and pleasant experience and also mitigate the visual and noise impact for Millennium Green users.

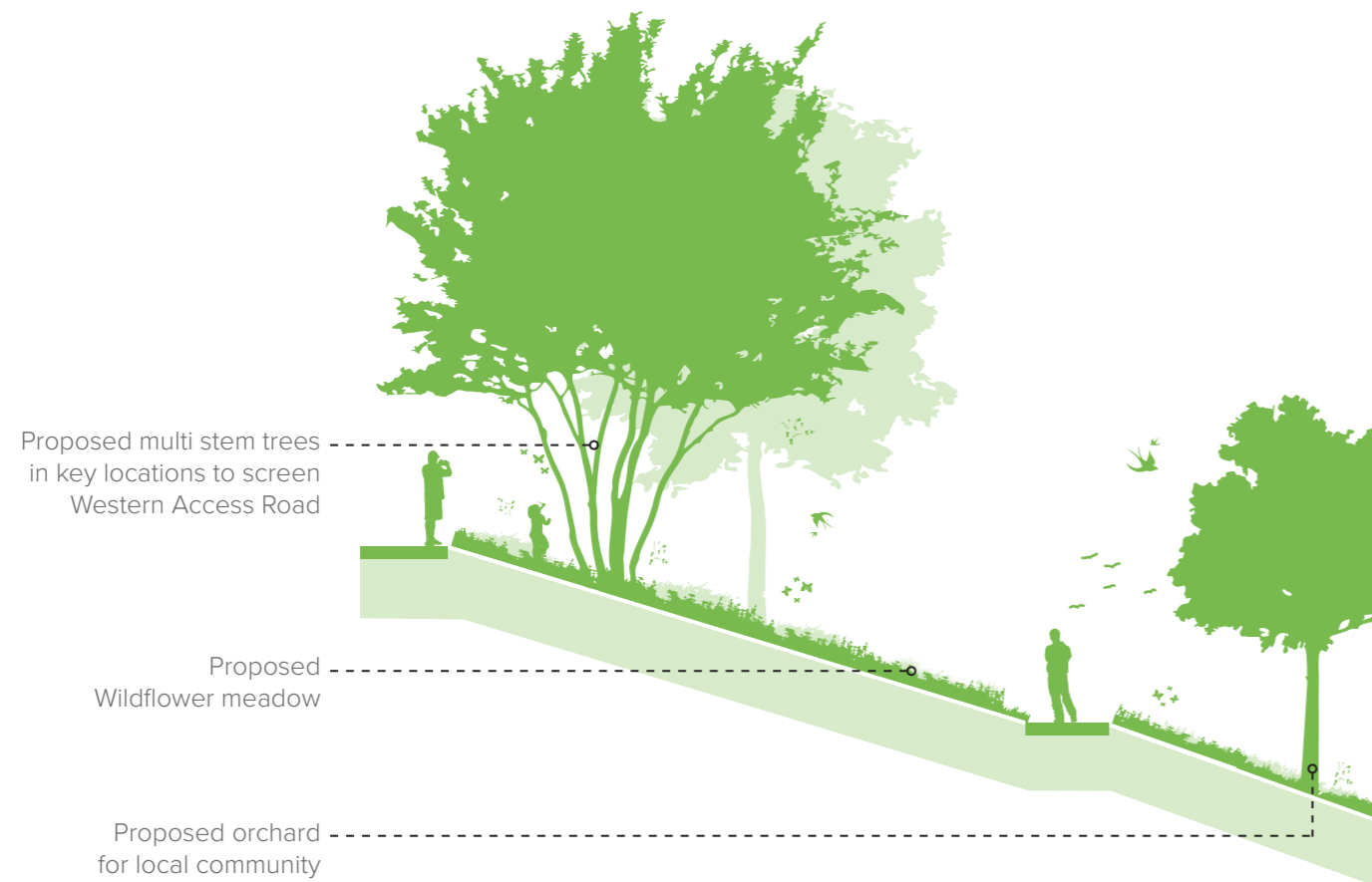


The planting strategy for this area aims to provide visual and acoustic mitigation to the proposed Western Access Road.

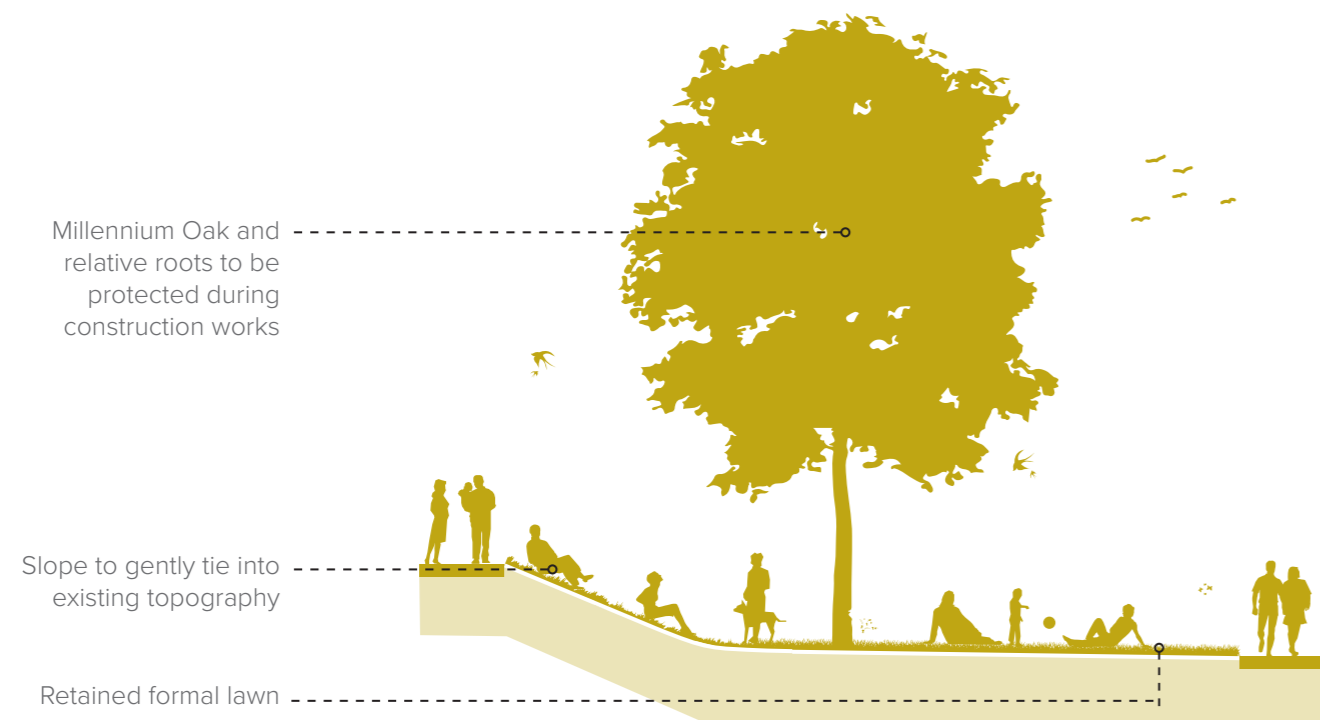
Trees to be multi stem with 2/3m clear trunk and canopies shaped to form a "tunnel effect".

Medium to tall shrubs and understory planting to be shade-tolerant and provide layered screen.

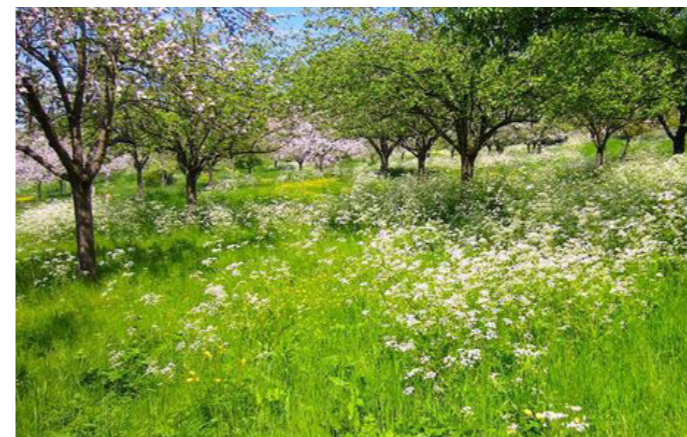




Meadow planting on slopes



Millennium Oak lawn areas



The planting character of this area is composed by medium to tall trees placed in strategic locations where there is greater need to screen the proposed Western Access Road and bridge abutments.

Grassland and meadow are proposed to enhance the ecological value of the site. An orchard composed by fruit trees and edible plants is proposed where the embankment profile and drainage conditions are more favourable.



The planting character of this area is dominated by the presence of the retained Millennium Oak.

The surrounding space is preserved as quiet managed lawn where people can gather and hang out.

The proposed embankment smoothly meets the existing topography, protecting the central space and offering further opportunity for seating.



5.4 Detailed Character Areas

5.4.1 Western Access & Millennium Green

The planting strategy for Millennium Green aims to create a natural environment where native species can thrive. Some of those species can be found below.



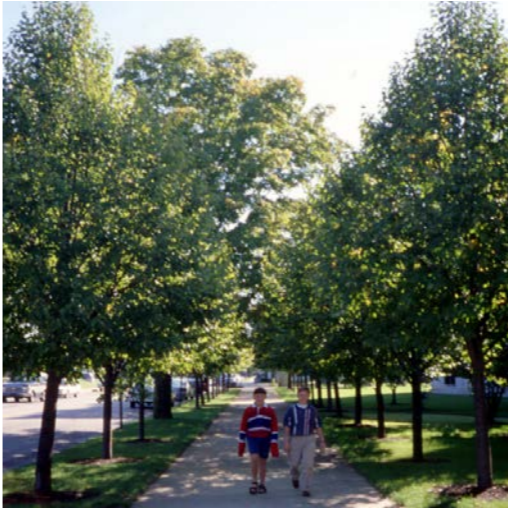
ACER CAMPESTRE



BETULA PUBESCENS



PRUNUS AVIUM (SWEET CHERRY)



TILIA CORDATA (LIME TREE)



INCORPORATE FRUIT TREES



BLACKTHORN



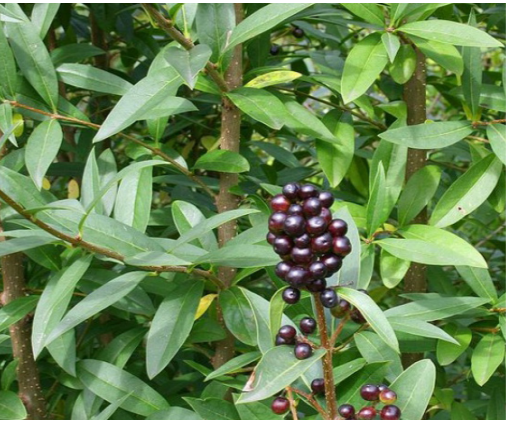
DOGWOOD



HAWTHORN



GUELDER ROSE



WILD PRIVET



LADIES BEDSTRAW



KNAPWEED



CRESTED DOGSTAIL



YARROW



MEADOW BUTTERCUP

Millennium Green topography and terraced walls

The overall structure of the Millennium Green embankment is defined by two accessible paths that intersect in the centre of the embankment. They provide pedestrian connections from the Western Access roadway down to the base of the protected grassland.

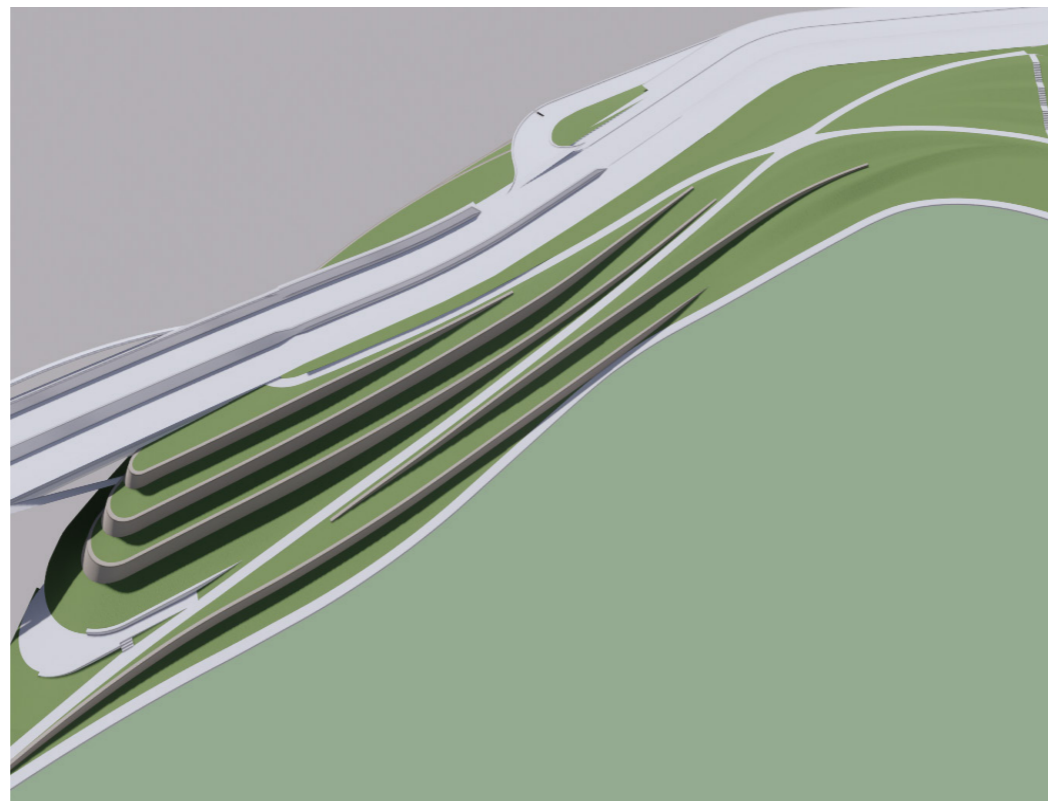
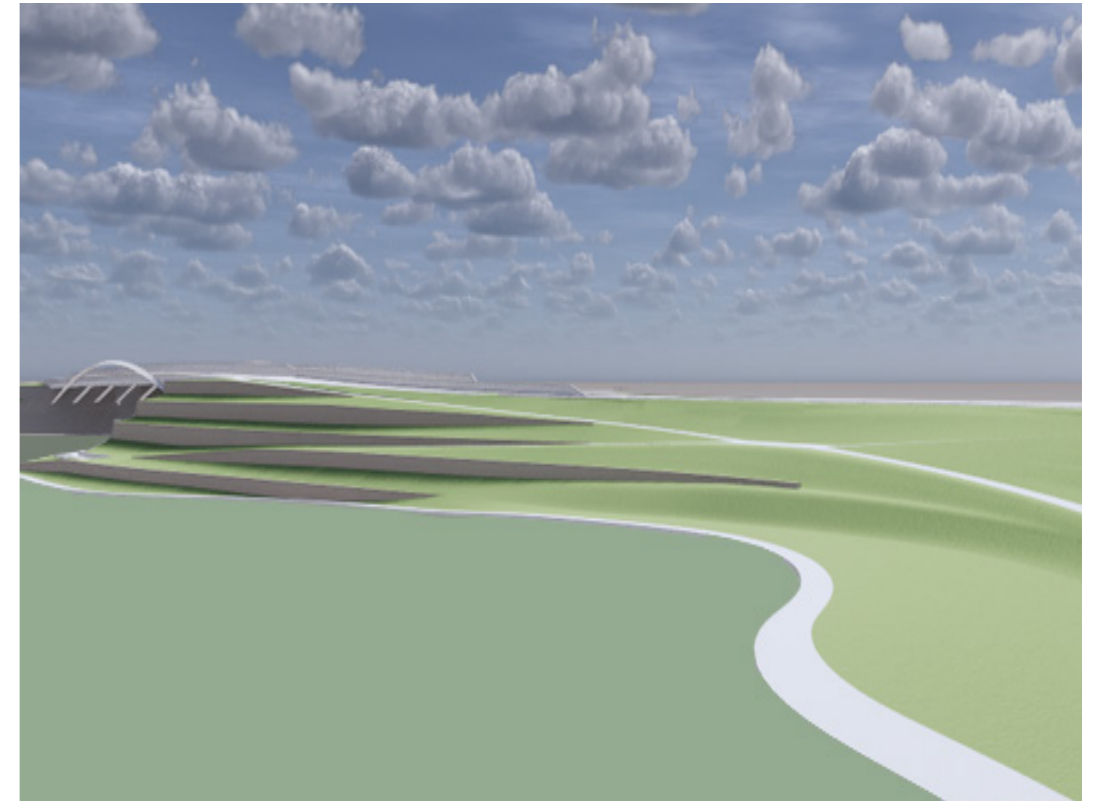
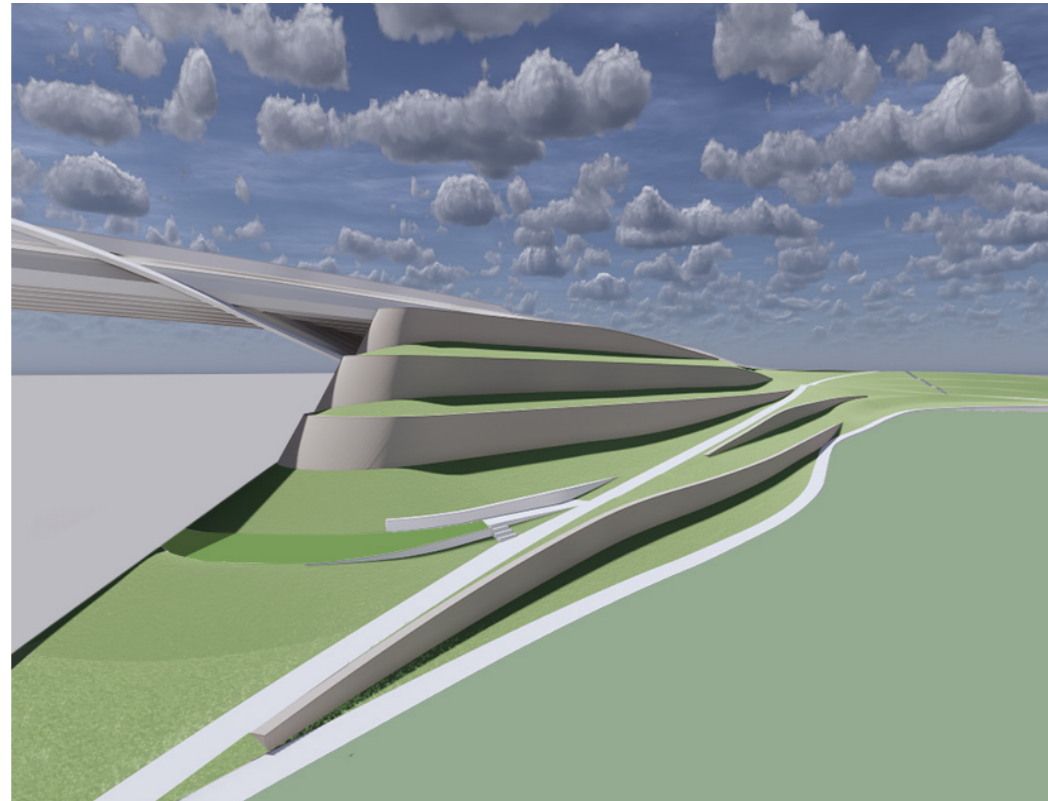
The extents of the embankment structure has been contained within the existing gravel pathway. This constraint, along with the profile of the road & bridge structure, has created a significant level change across a relatively narrow area.

As such, to create a pleasant and plantable embankment profile, a series of gabion terraces have been implemented, particularly on the southern end of the green. These provide landscape zones, between the walls, which are able to facilitate significant planting. This planting is key to create a slope which can tie into the natural character of Millennium Green, while still containing the significant level difference between the grassland and the road.

These vertical gabion walls, which form the terraces, wrap around and transition into the abutment beneath the bridge structure. The gabion walls, along with the bridge abutment, will be faced with the same natural stone finish.

As the embankment moves to the northern end of Millennium Green, the level difference between the road and the existing footpath reduces, meaning smoother, gentler slopes can be utilised. Here gentle folds will be woven into the slopes creating pleasant ripples in the profile of the slope, which tie seamlessly into the staircase provided at the sites northern corner.

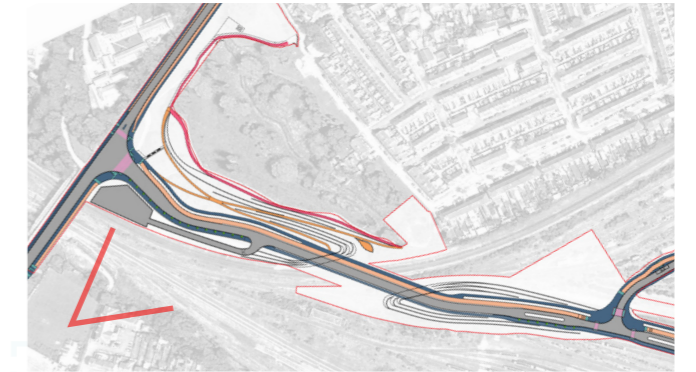
Just below this staircase the existing levels are retained, in close proximity to the Millennium Oak, to create a contained area of open grassland for recreation beneath the historic tree.



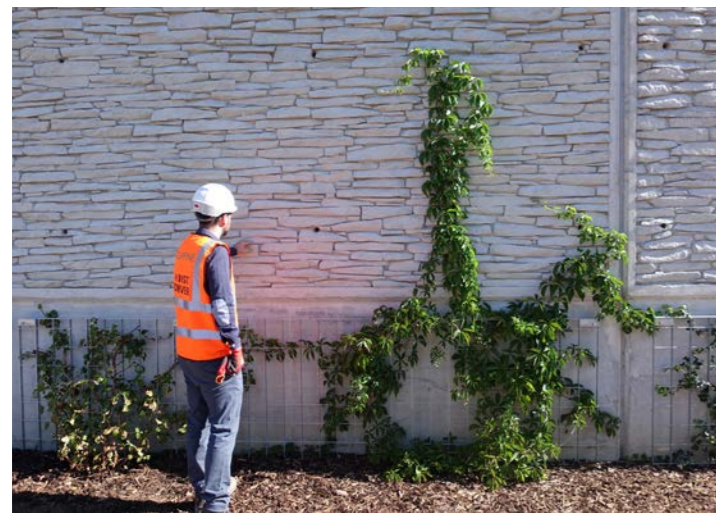
5.4 Detailed Character Areas

5.4.1 Western Access & Millennium Green





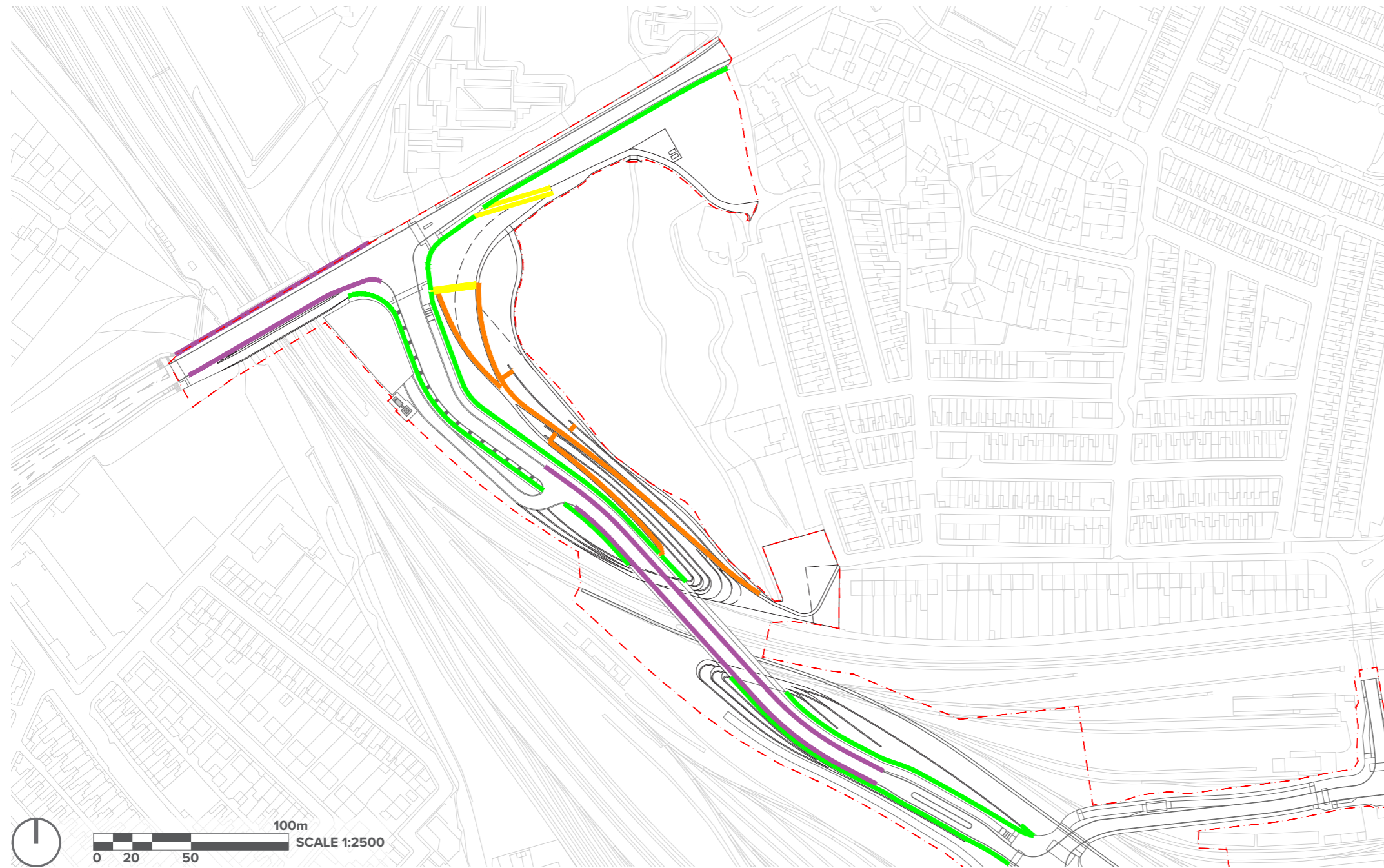
The southern embankment will be faced with a natural stone and covered with climbing plants. Bird and bat boxes will be introduced to increase the biodiversity of the site and create habitats for animals to thrive. The stone wall and climbers will soften the visual characteristics of the large vertical wall, minimising adverse views.



Precedent images of green walls using a textured wall or a steel ropes system

5.4 Detailed Character Areas

5.4.1 Western Access & Millennium Green



- - - RMA BOUNDARY
- LANDSCAPE FENCE - Millennium Green and Terraces Boundary Fence
- RAILING - Millennium Green Pathways and Terraces
- HANDRAIL TO STEPS AND RAMPS - Millennium Green
- Highway Buffers

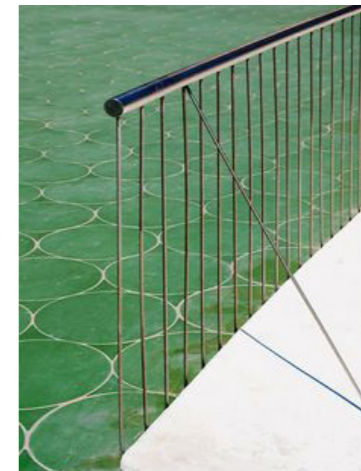
Railing strategy

This page shows the railings, fences and handrails within and surrounding Millennium Green and the terracing south of the ECML.

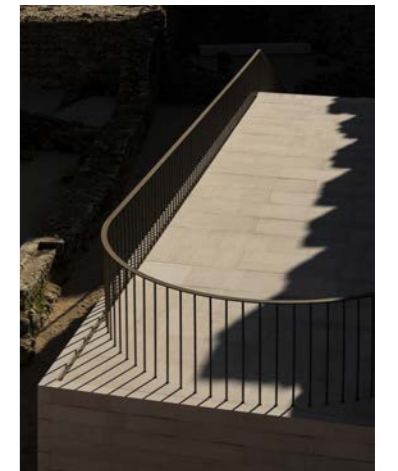
The fencing shown in green on the diagram bounds the green areas and creates a separation between green space and the highways.

The handrail shown as yellow on the diagram is a simple handrail to facilitate the use of the stairs and ramps safely.

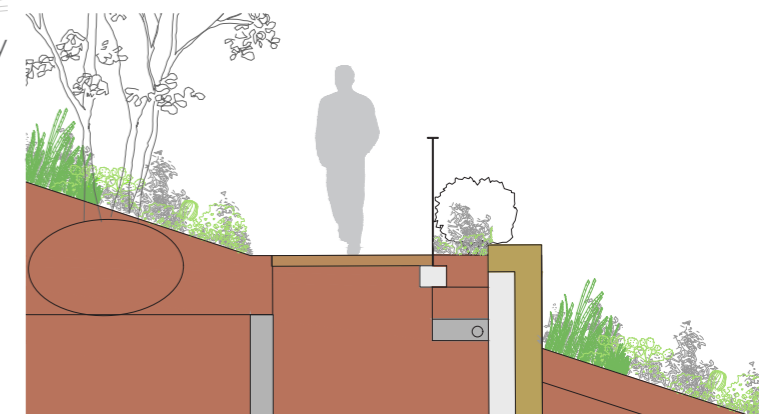
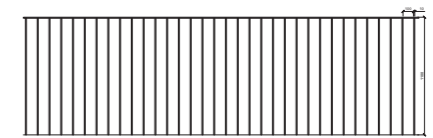
The railing shown as orange on the diagram separates the safe areas for pedestrians from the unsafe drops. They will be simple vertical bars with a top rail similar to the images below. The section below illustrates where they will be placed in relation to the paths and gabions.



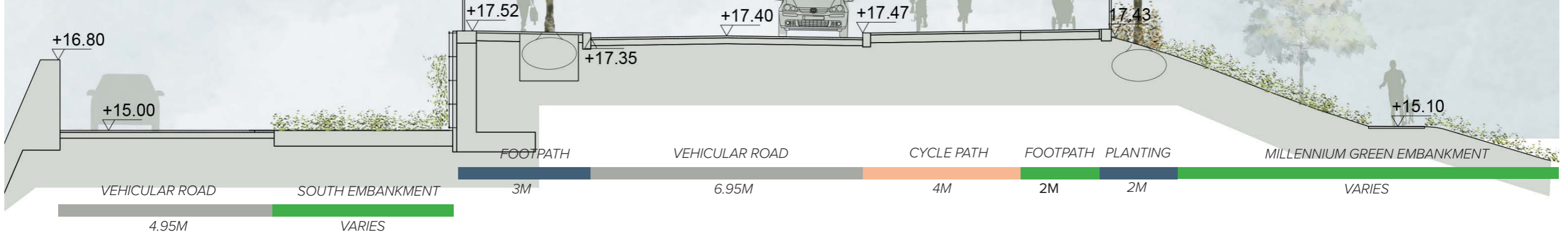
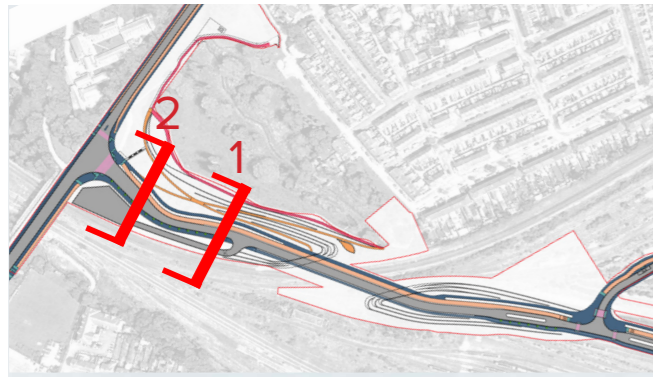
Example Railing



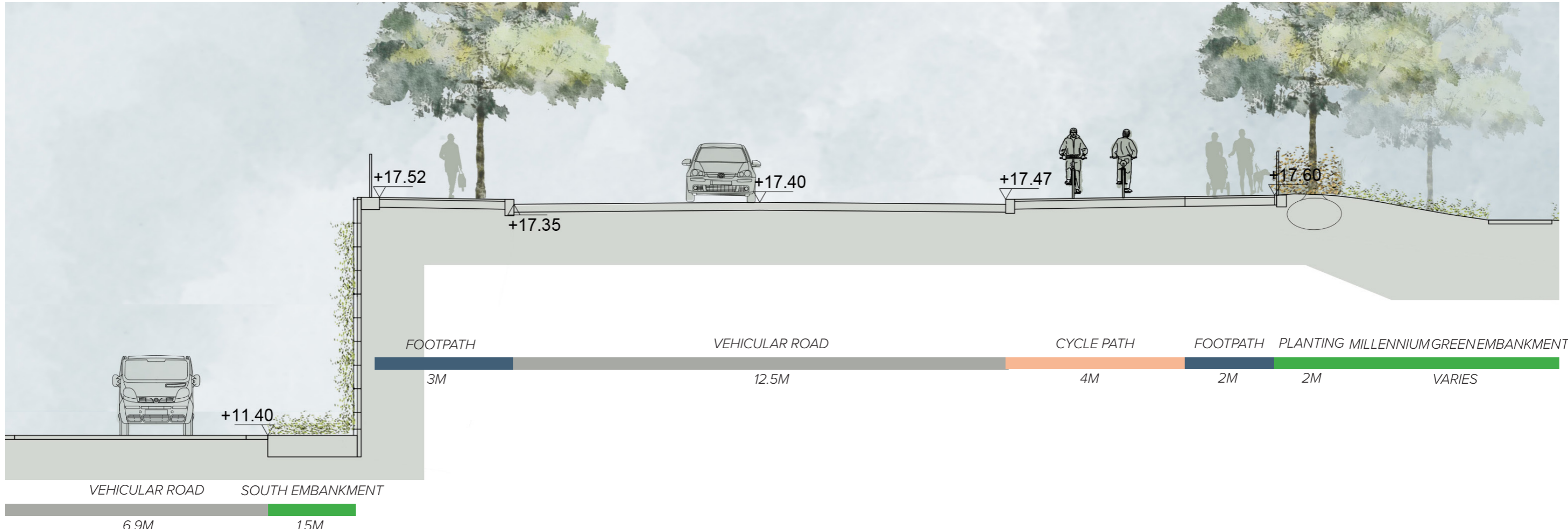
Example Railing



Railing Section



SECTION 1: Phase 1 condition



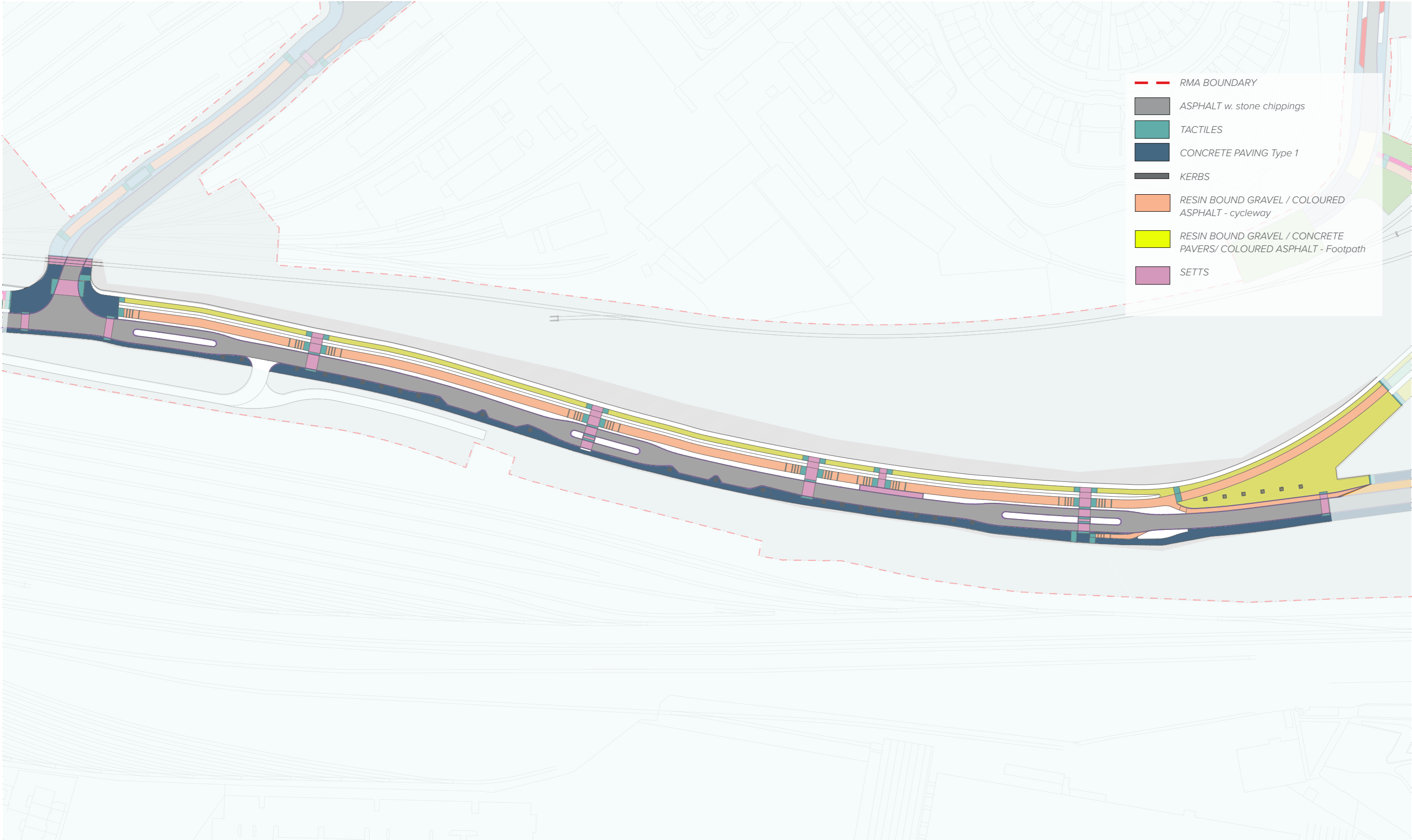
SECTION 2: Phase 1 condition



5.4 Detailed Character Areas

5.4.2 Park Street

General Arrangement - Hardscape



Materials Strategy

The surfacing of Park Street will be fairly similar to that of the Western Access road. However, as we approach the premium zones of the development, the premium detailing of the streetscape becomes more regular.

The footpaths on the southern side, will be lined precast concrete pavers featuring the same buff natural stone aggregate as the Western Access. On the northern side, the footpath will be paved with resin bound gravel or self binding gravel or coloured asphalt or concrete pavers.

Regularly spaced pedestrian crossings (spaced approximately every 100m) provide key access points to bus stops, and proposed building and park entrances. These will be lined with setts, both in the roadway and on the adjacent kerb ramps. The parking bays on the south side of the roadway will be in the same asphalt as the road.

The cycleway will be laid with the resin bound gravel or coloured asphalt, as before. However additional detailing will be provided at the pedestrian junctions. To signify that cyclists need to be wary of these pedestrians and manage their speed, pavers will be laid in strips as one approaches the crossings. These will provide a visual and sensory indication to cyclists of an approaching junction. Furthermore, directly adjacent to these junctions, the cycleway will dip down to meet the lowered level of the pedestrian crossing, and be paved with a 2.5m long strip of corduroy pavers. These detailed additions to the cycleway will not only improve the safety of the paths for both pedestrians and cyclists but improve the overall material quality and aesthetic of the streetscape.

The use of these materials, (concrete, stone, steel timber furniture etc.) evokes the industrial heritage of the sites context.



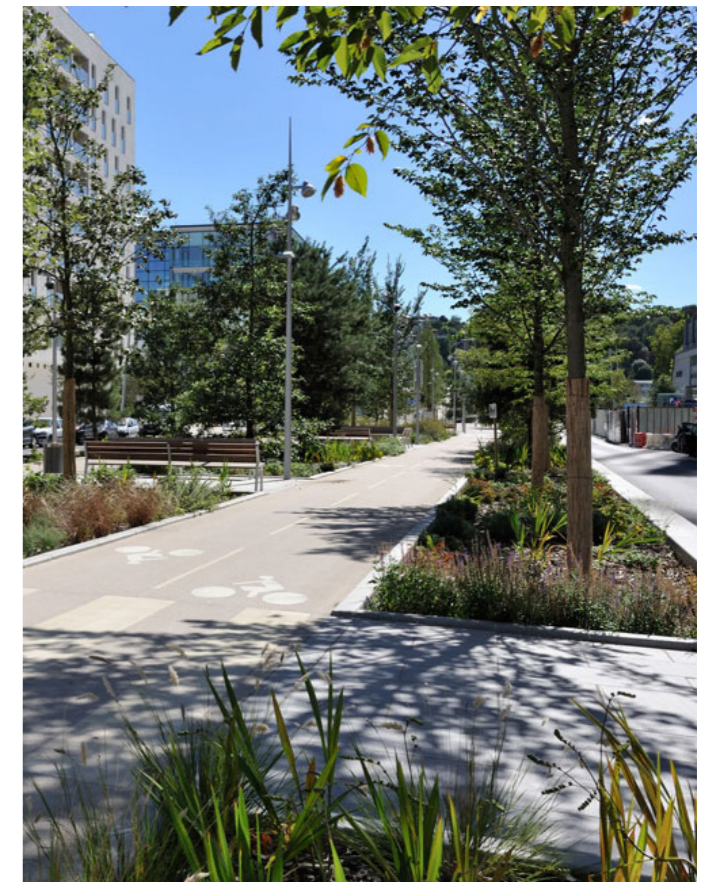
Overall Materials Palette



Precedent image of cycleways



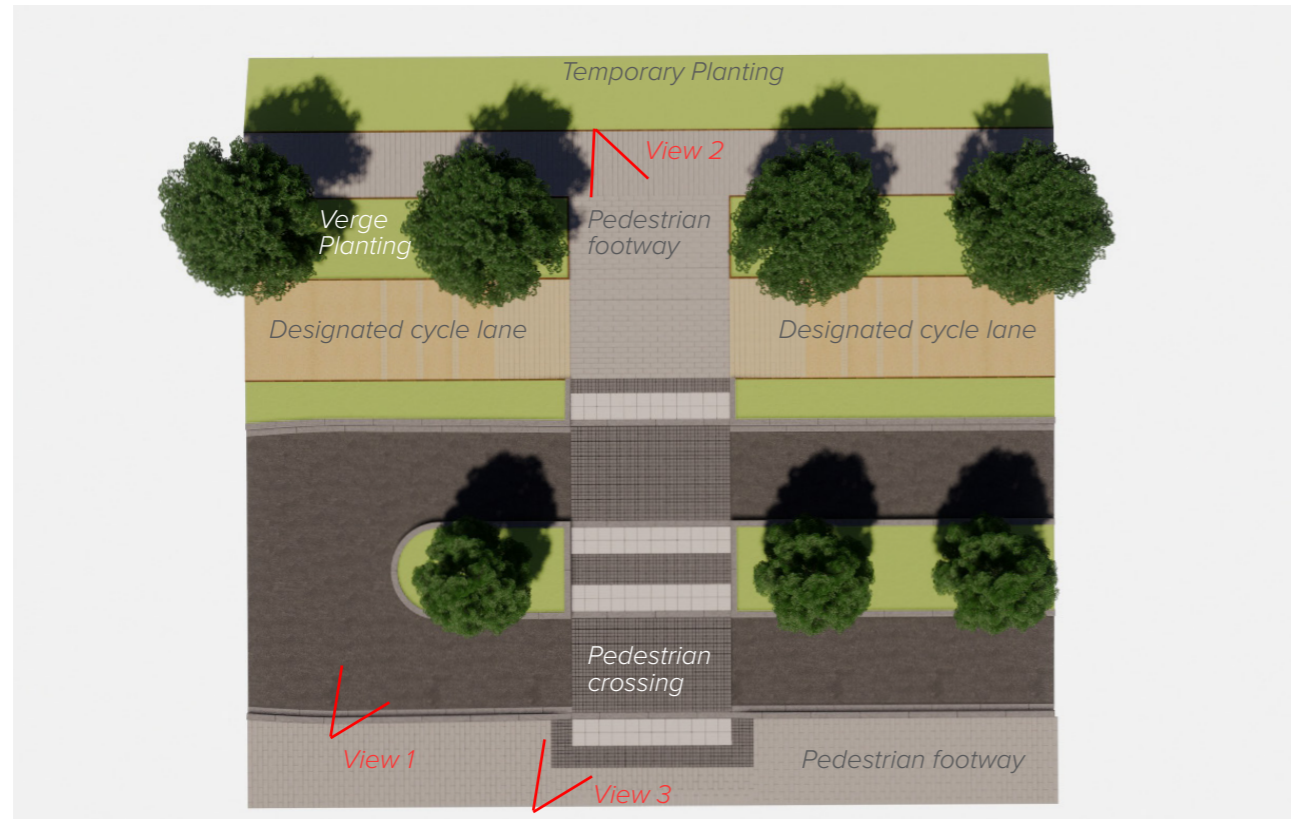
Precedent image of pedestrian footways



Precedent image of cycleways

5.4 Detailed Character Areas

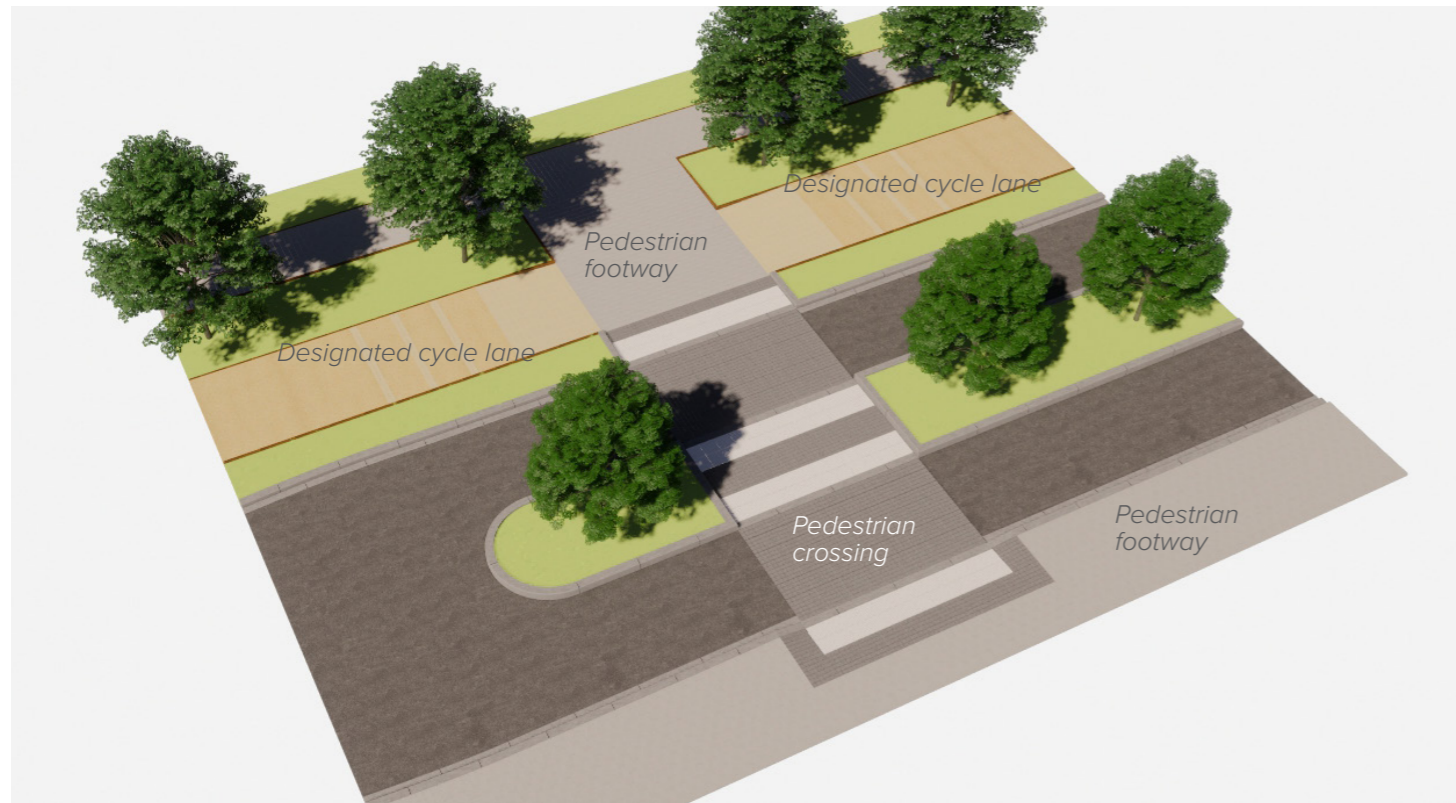
5.4.2 Park Street



Illustrative plan of typical crossing



View 2



View 1



View 3

5.4 Detailed Character Areas

5.4.2 Park Street

General Arrangement - Hardscape



Tree planting strategy

— RMA BOUNDARY

● PARK STREET NORTH TREES (e.g. *Quercus robur*, *Acer pseudoplatanus*, *Fagus sylvatica*)

● CENTRAL MEDIAN TREES (e.g. *Prunus padus*, *Prunus avium*, *Prunus serrulata*, *Betula pubescens*, *Pyrus calleryana*)

● PARK STREET SOUTH TREES (e.g. *Alnus glutinosa*, *Acer campestre*, *Gleditsia triacanthos*, *Sorbus aucuparia*)

● PARK STREET SOUTH TREES (e.g. *Alnus glutinosa*, *Acer campestre*, *Gleditsia triacanthos*, *Sorbus aucuparia*)

Planting Strategy

This drawing shows the tree planting strategy and the different characteristics of the spaces. Trees lining the north of the road will be large street trees, whereas the central median and southern trees will have different sizing and characteristics, which are used to differentiate the character and use of the spaces.



Quercus robur



Acer pseudoplatanus



Gleditsia triacanthos



Acer campestre



The tree planting strategy within Park Street has been developed with focus being placed on the sites future surrounding context and soil conditions available.

Trees running along the park edge are being planted within 2m wide continuous planted verge, providing large amounts of soil volume. This planted verge is also creating a green buffer for pedestrians that enhances the close relationship to the park. As a result of the above, the trees planted within this verge will be larger species.

Trees along the southern-side of the footpath will be planted within the hard landscape, utilising soil cells below the footpath to provide adequate soil volumes. These trees will be planted alongside future residential and commercial developments. Both factors contribute to the specification of smaller tree species.

All proposed trees will have a clear stem height of 2m to maintain sight lines.

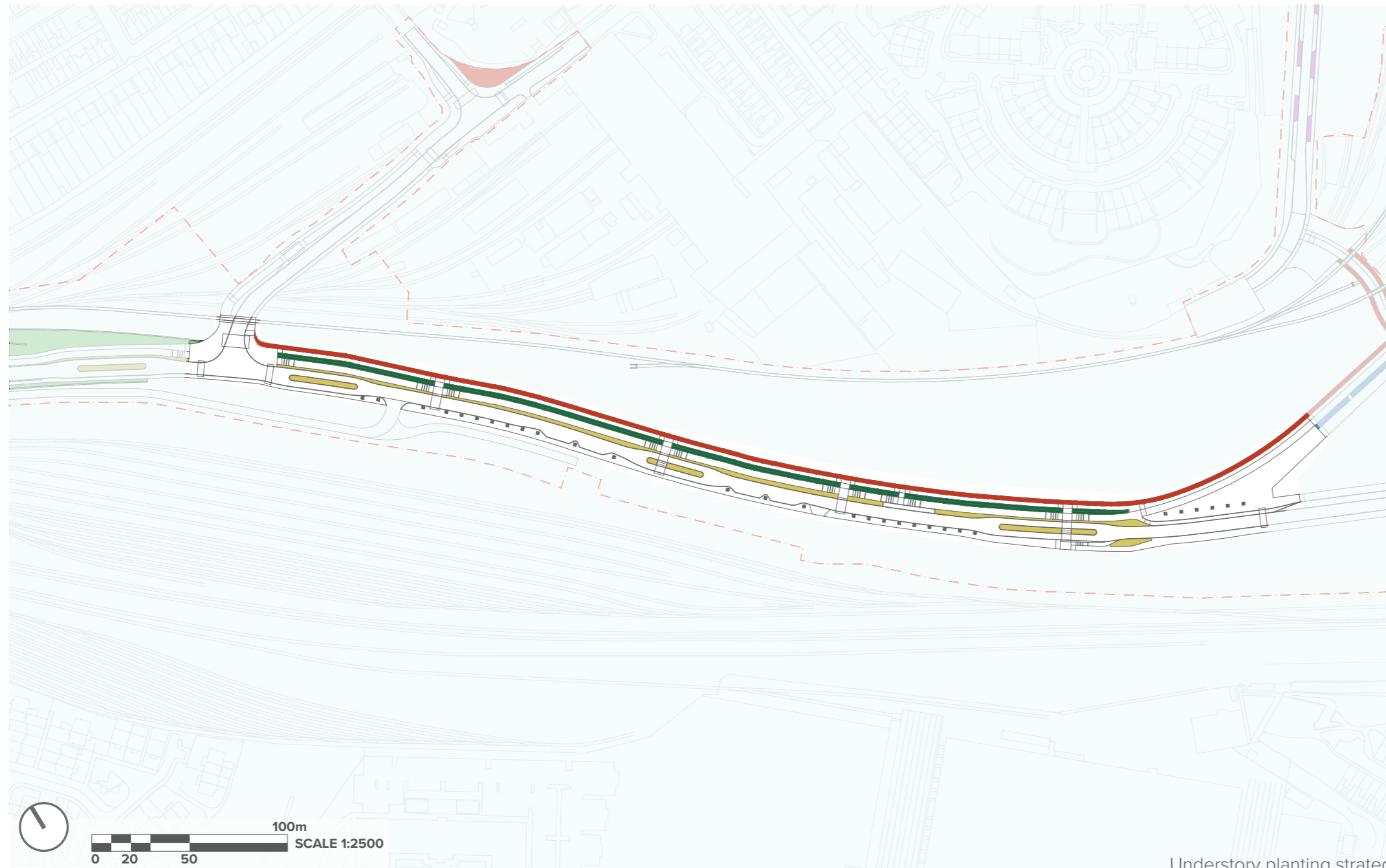
Park Street tree planting strategy

- LARGE TREE PLANTING ADJACENT TO PARK
- SMALLER TREE PLANTING WITHIN HARD LANDSCAPE

5.4 Detailed Character Areas

5.4.2 Park Street

General Arrangement - Softscape



- RMA BOUNDARY
- VERGE PLANTING (e.g Sambucus nigra, Viburnum lantana, Viburnum opulus, Rhamnus cathartica, Rosa canina, Cornus sanguinea)
- MEDIAN PLANTING (e.g. Deschampsia cespitosa, Pennisetum alopecuroides, Miscanthus sinensis 'Little Kitten', Armeria maritima, Helichrysum italicum, Achillea filipendulina)
- TEMPORARY PLANTING (wildflower meadow)



Pennisetum alopecuroides

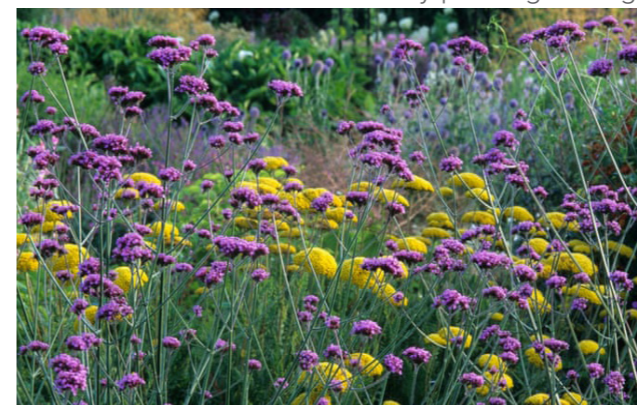


Carex vulpinoidea



Panicum sp.

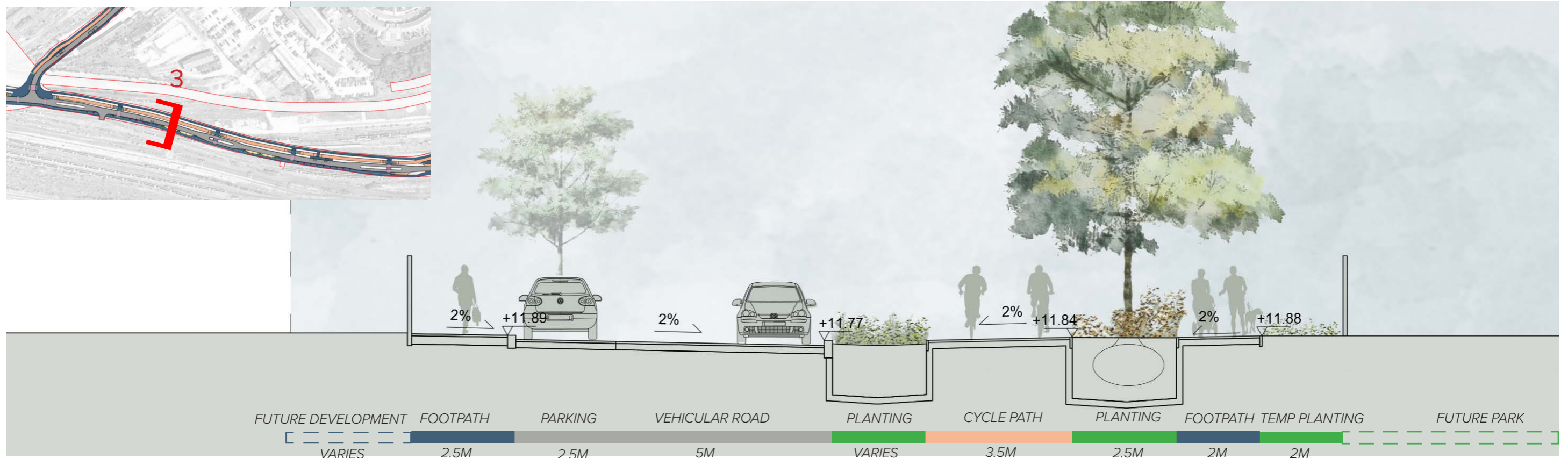
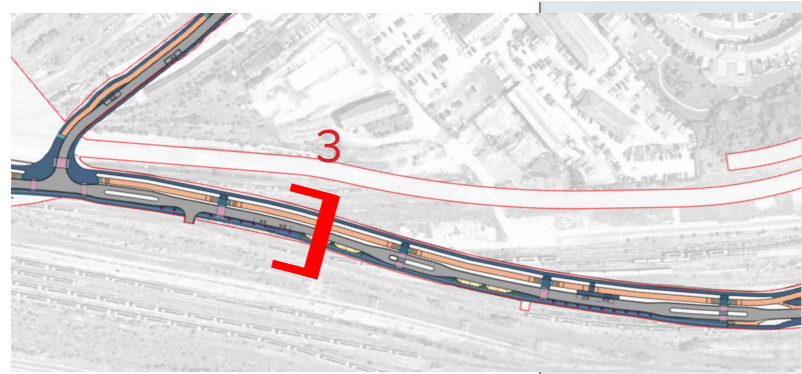
Understory planting strategy



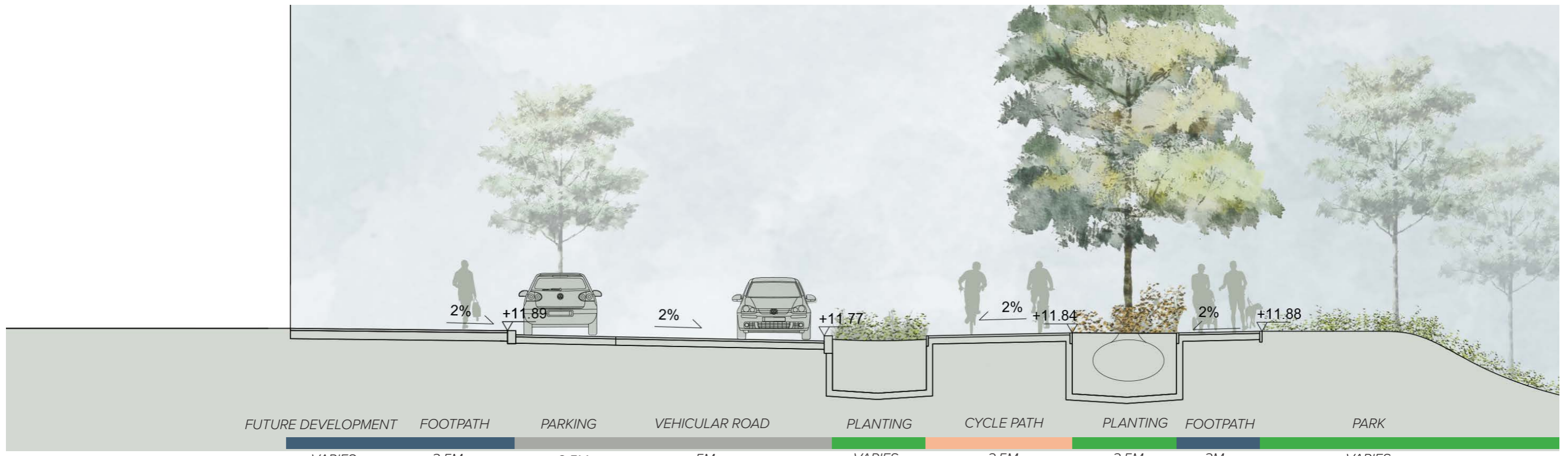
Verbena bonariensis



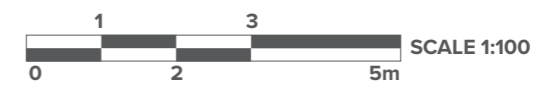
Armeria maritima



SECTION 3: Phase 1 infrastructure condition

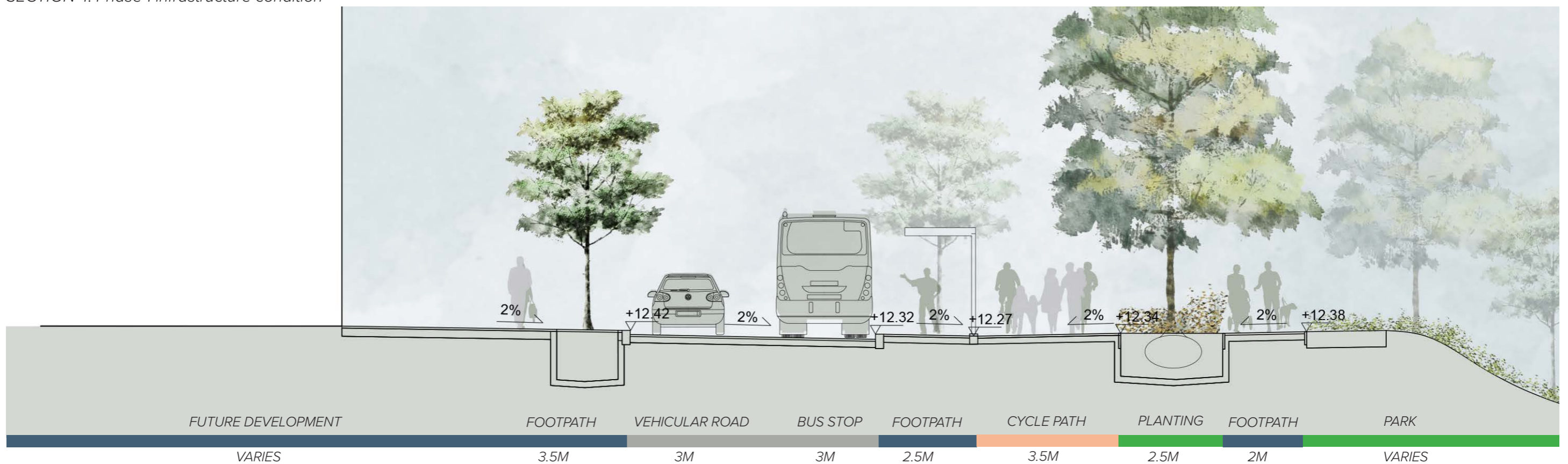
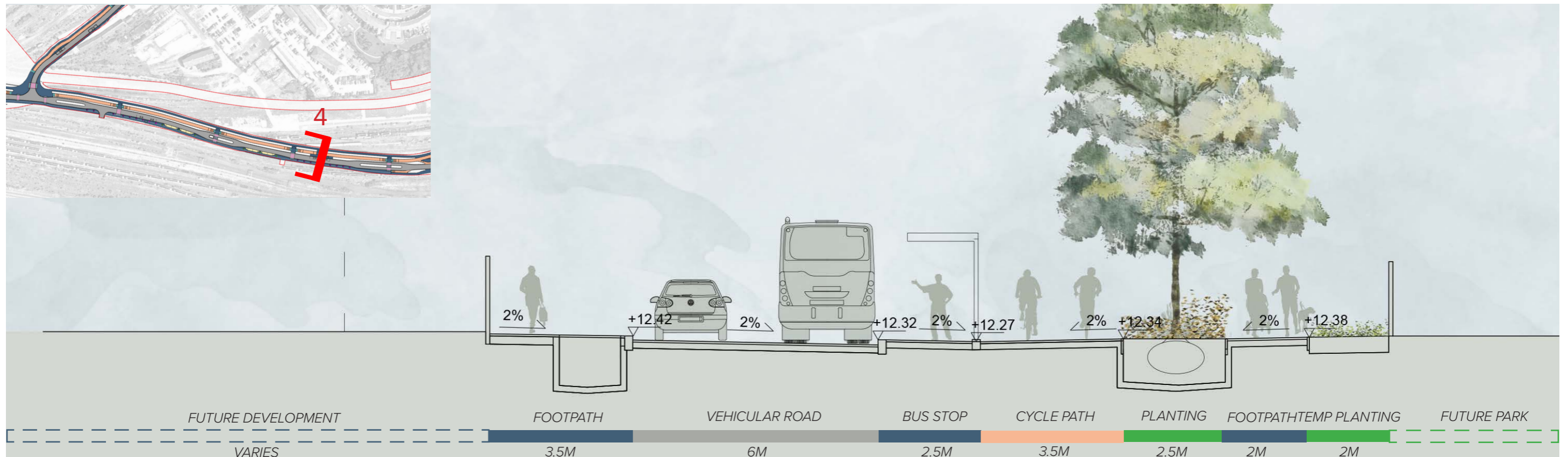


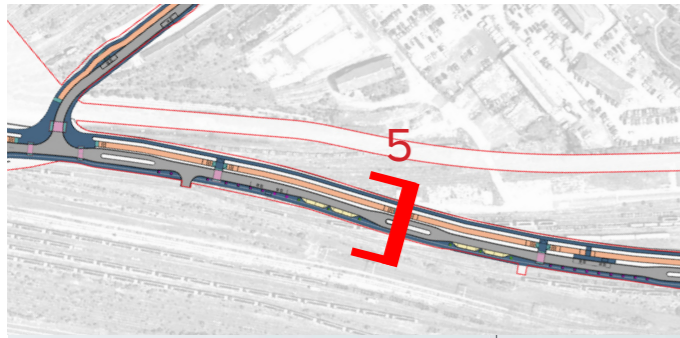
SECTION 3: Master plan condition (i.e. when the wider plots are delivered)



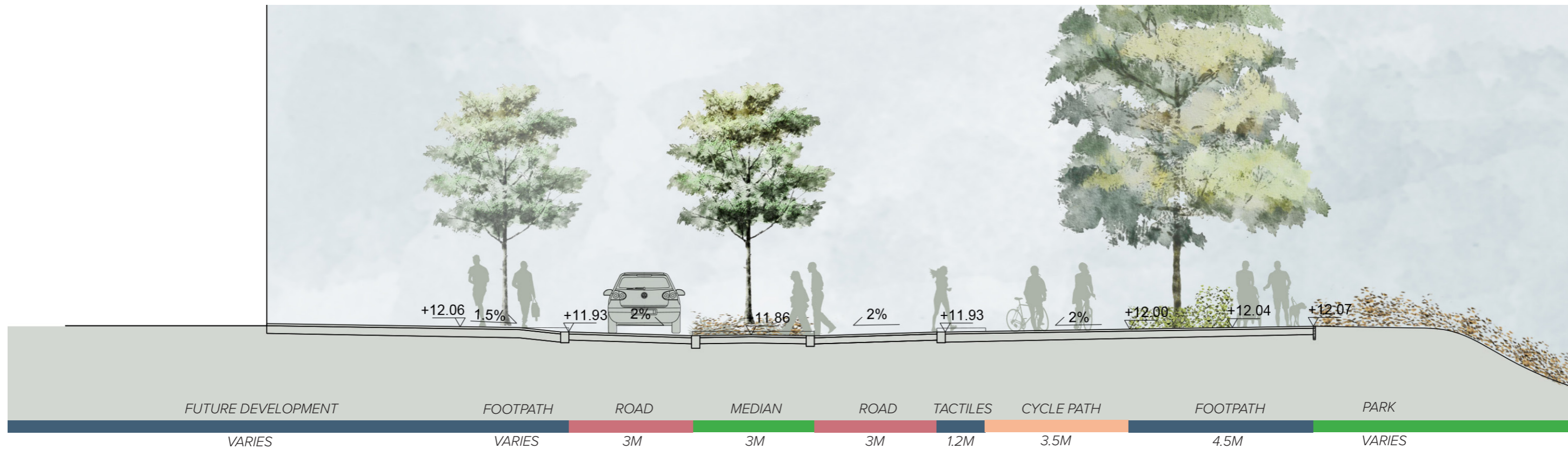
5.4 Detailed Character Areas

5.4.2 Park Street





SECTION 5: Phase 1 Infrastructure condition

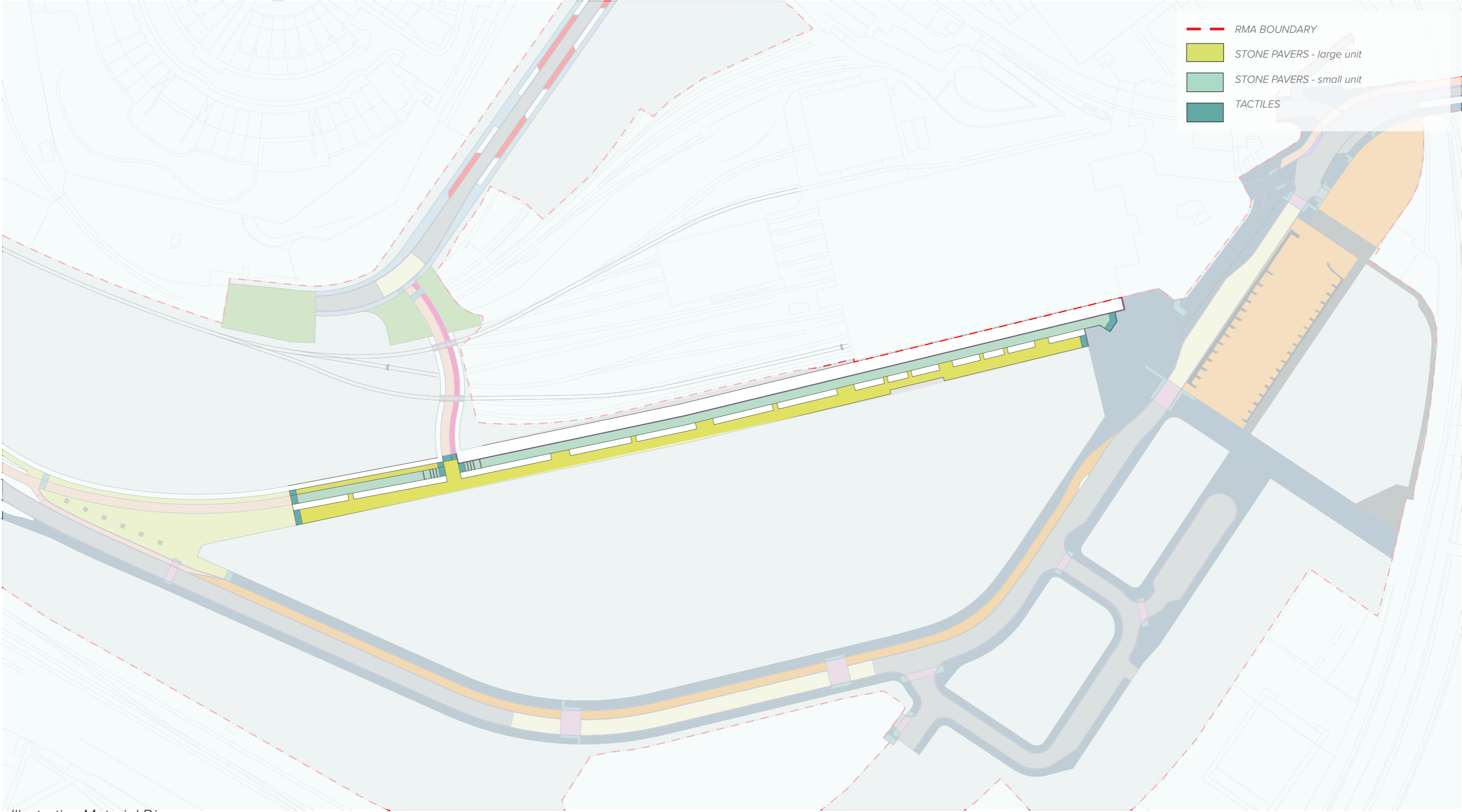


SECTION 5: Master plan condition (i.e. when the wider plots are delivered)

5.4 Detailed Character Areas

5.4.3 Hudson Boulevard

General Arrangement - Hardscape



Illustrative Material Diagram

Materials Strategy

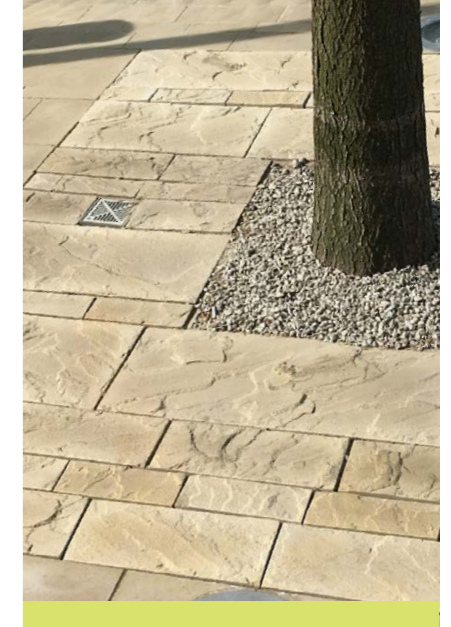
As the pedestrian and cycle paths move from Park Street onto Hudson Boulevard, the materiality transitions to a more premium finish. The Boulevard acts as the key pedestrianised connection through to New Square and sits adjacent to the historic rail yards and goods station. Therefore, it is appropriate that the material quality of the surfacing through this corridor reflects its connective and heritage prominence. The concrete pavers used along Park street, switch to large unit natural stone pavers. This finish reflects the use of stone throughout the historic city centre of York and creates a symbolic material connection between the old city and the new development.

The same stone will be used along the boulevard’s cycleway, creating a cohesive material character. However, the cycleway paving will be differentiated by a smaller unit size. This will indicate to the pedestrian and cyclist, along with integrated signage, the separated uses for the 2 pathways.

There will be crossings staggered along the boulevard, which provide pedestrian access across the central planted spine. These connections will also be paved in the smaller natural stone flags but feature wider permeable joints.

These various paving conditions will be separated by metal edges, both flush and raised, to permit where appropriate the drainage of the boulevard’s water run-off into the central rain garden strip.

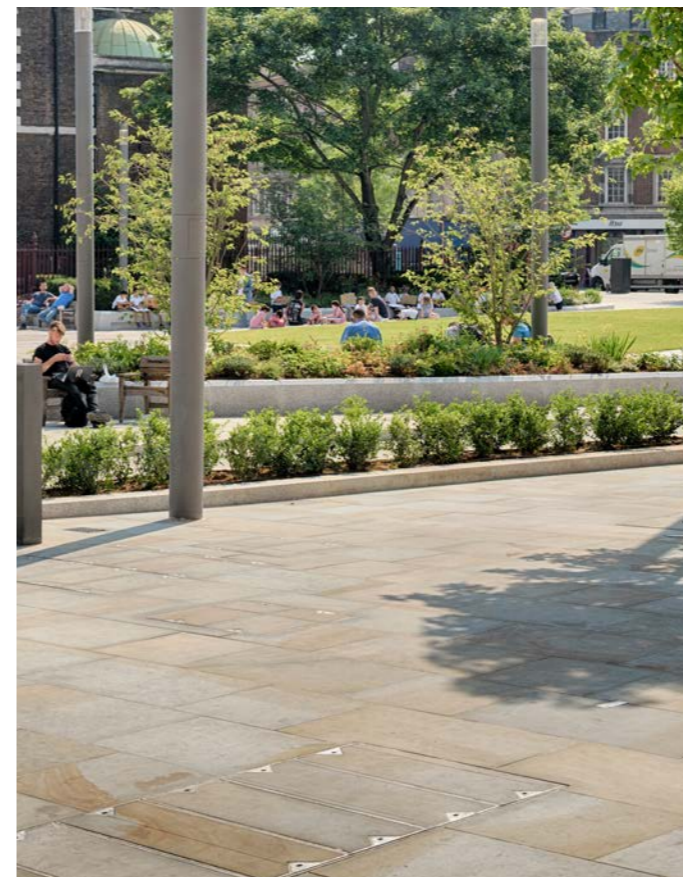
A raised natural stone kerb will rest against the northern edge of the cycleway, adjacent to the proposed train exhibition line, containing and defining cyclist movement through the corridor.



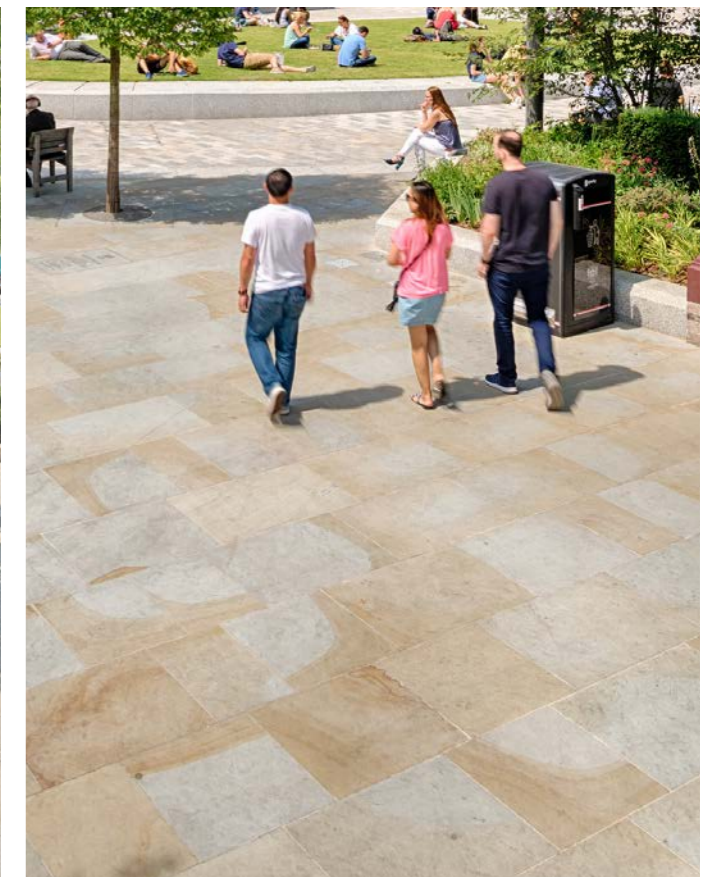
Overall Materials Palette



Precedent image of demarcated cycleways



Precedent image of pedestrian footways

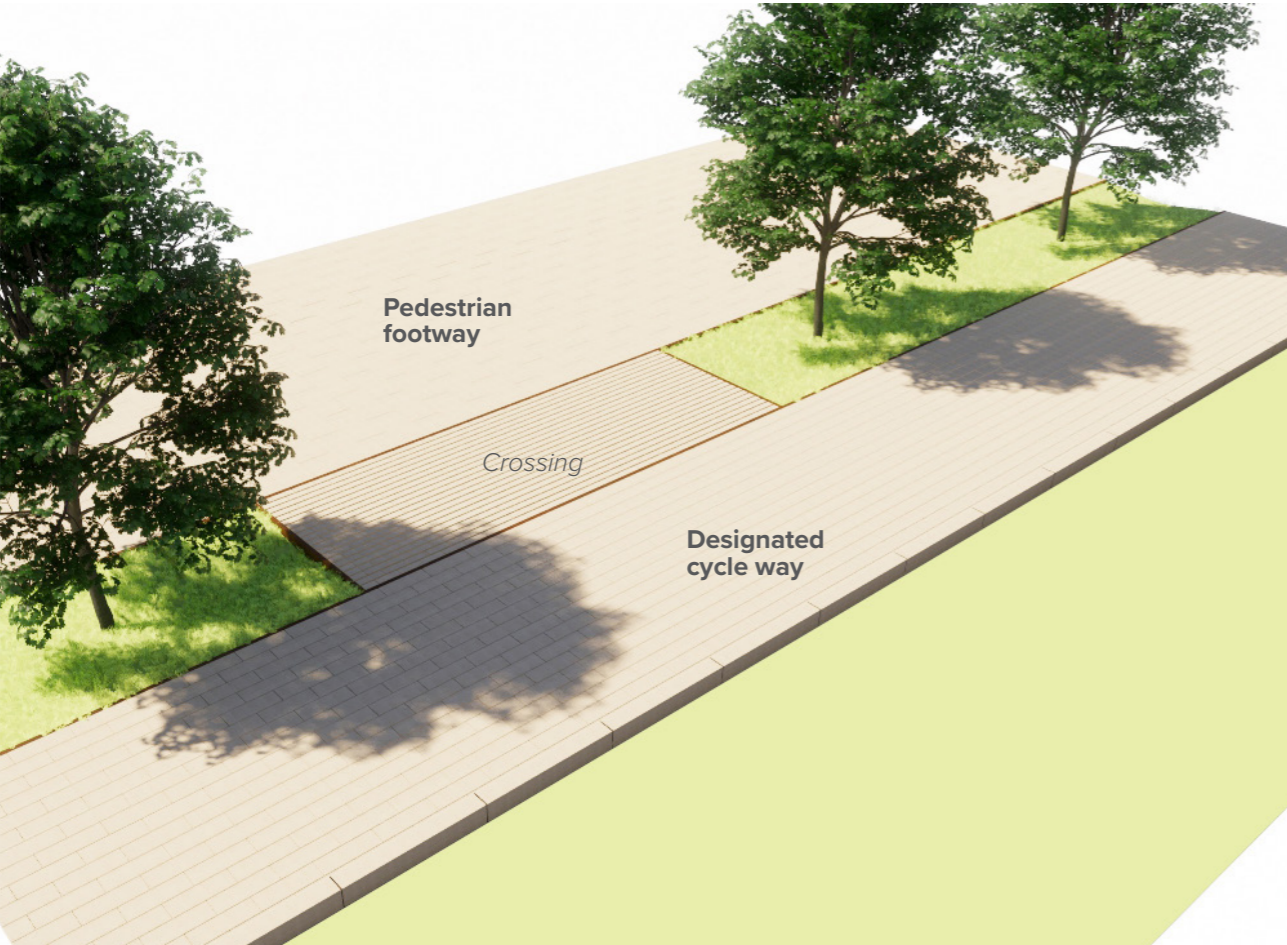


Precedent image of pedestrian footways

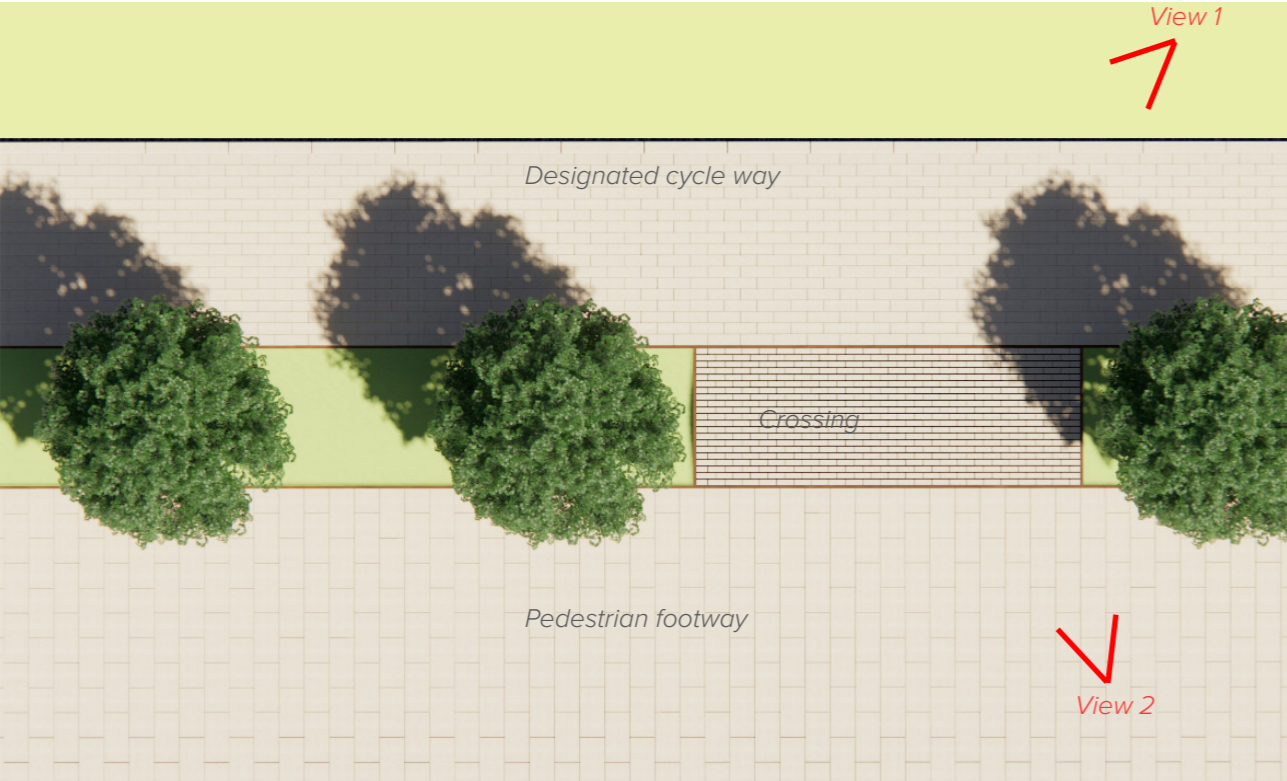
5.4 Detailed Character Areas

5.4.3 Hudson Boulevard

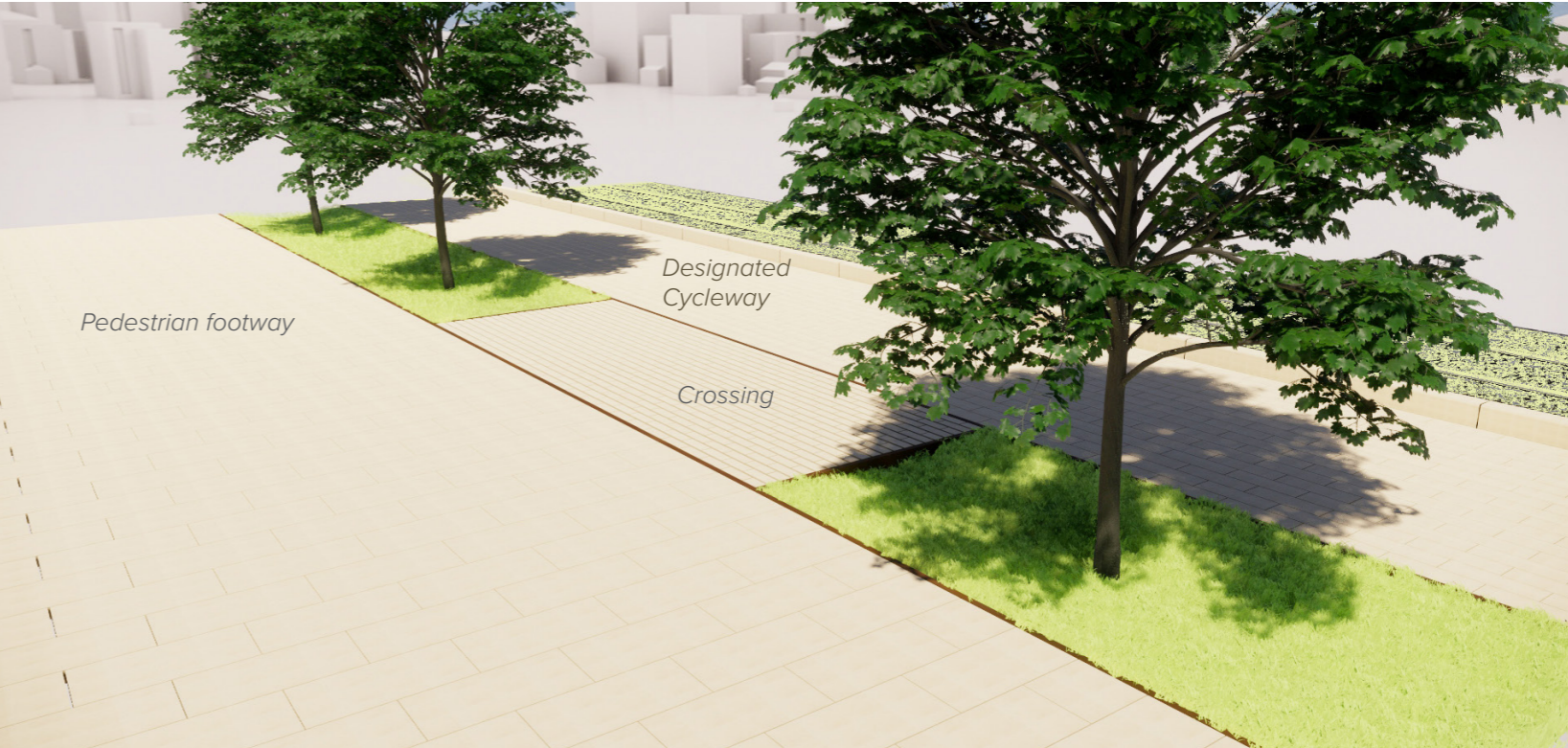
Rendered views



View 1

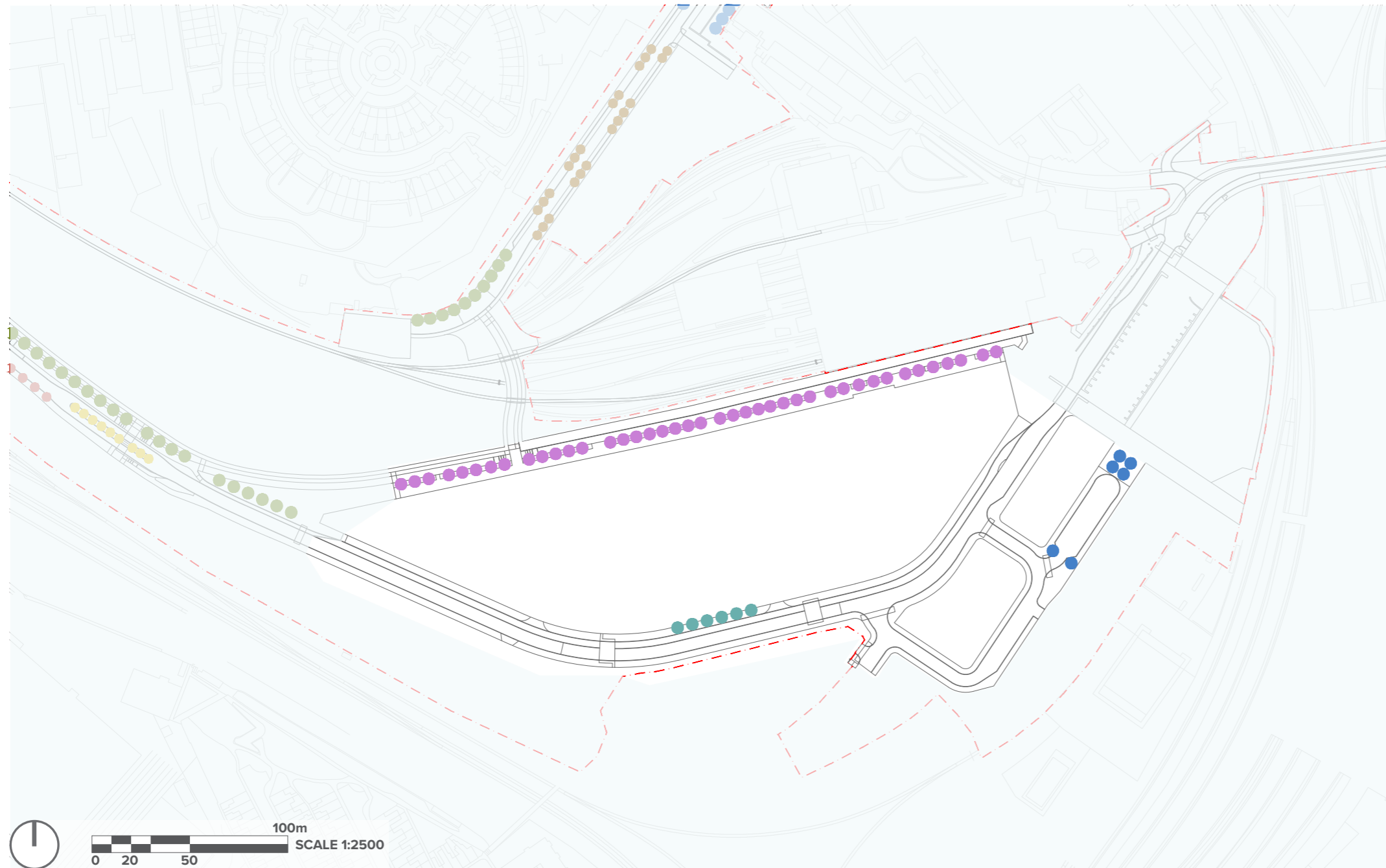


Illustrative plan of typical crossing



View 2

General Arrangement - Softscape



- - - RMA BOUNDARY
- + CINDER STREET TREES (e.g. *Ulmus parvifolia* 'Bosque')
- + BOULEVARD TREES (e.g. *Quercus palustris*, *Alnus glutinosa*)
- + GATEWAY TREES (E.g. *Ginkgo biloba*, *Liquidambar styraciflua*, *Liriodendron tulipifera*)

The tree planting along Hudson Boulevard creates a direct pedestrian and bicycle desire line between the museum square and park street, enhancing the public realm like feeling.

The trees along cinder street work to soften the backdrop of the bus lane. since this is not the primary pedestrian route less planting and trees have been placed here.



Liquidambar styraciflua



Liriodendron tulipifera



Quercus palustris

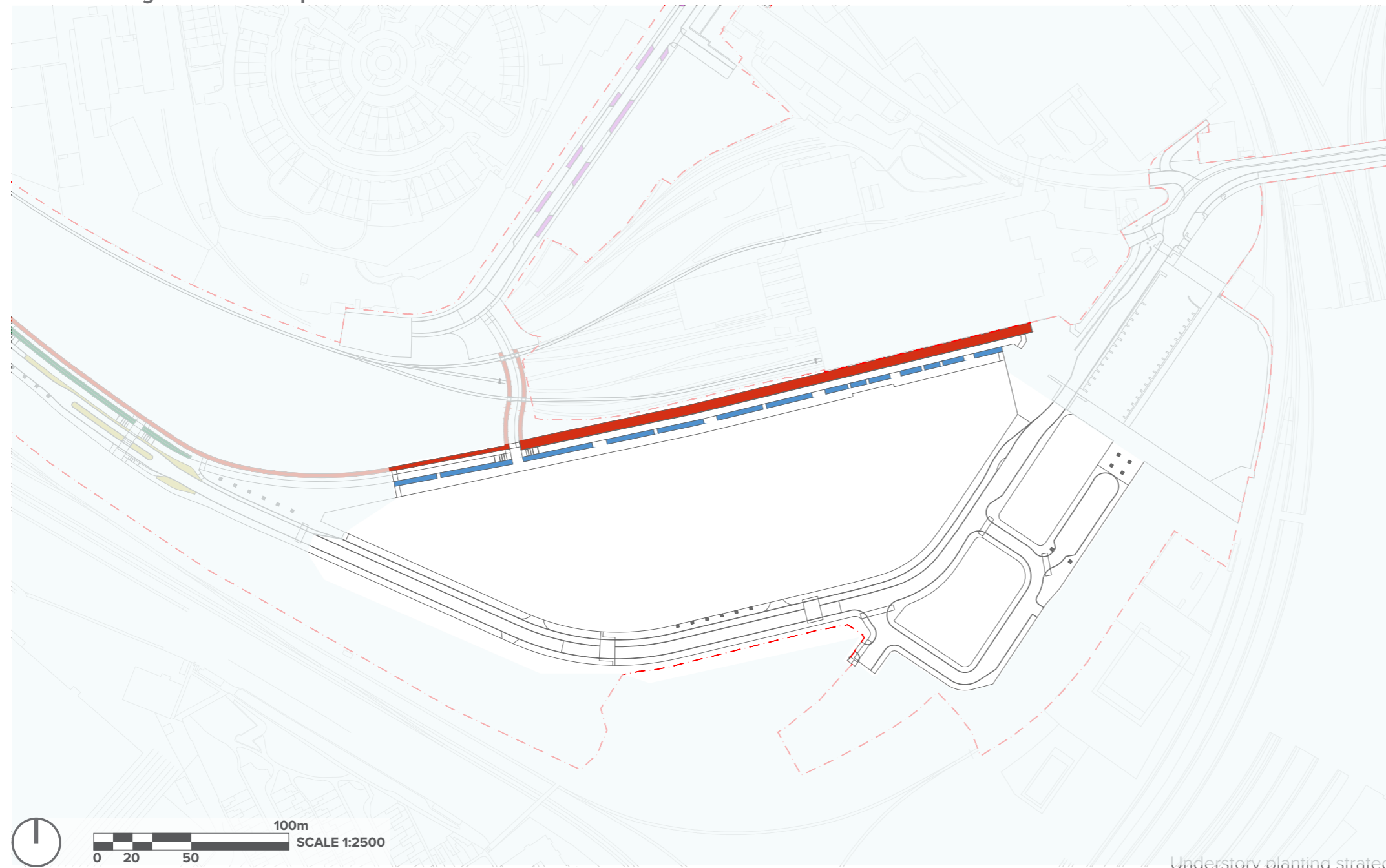


Ulmus parviflora 'Bosque'

5.4 Detailed Character Areas

5.4.3 Hudson Boulevard

General Arrangement - Softscape



- - - RMA BOUNDARY
- - - RAIN GARDENS (*Achillea millefolium*, *Carex stricta*, *Juncus effusus*, *Dryopteris dilatata*, *Dryopteris felix-mas*, *Iris pseudocorus*, *Rudbeckia fulgida*, *Verveine bonariensis*)
- TEMPORARY PLANTING (Wildflower meadow)



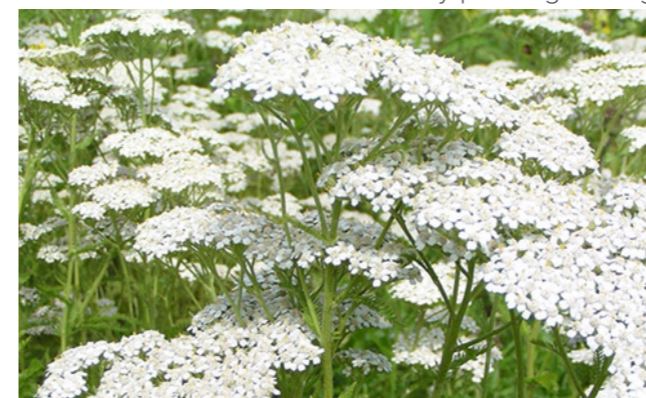
Juncus effusus



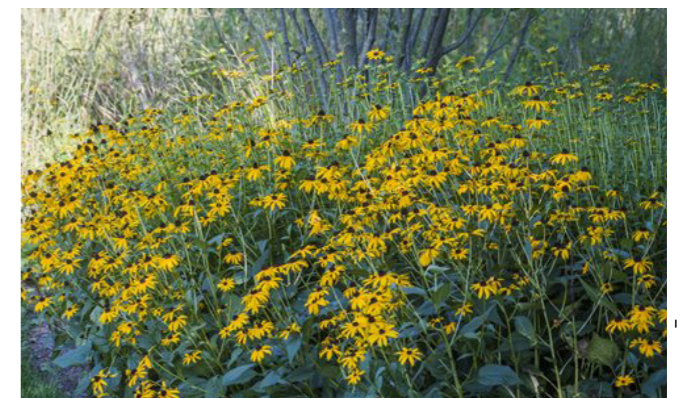
Dryopteris felix-mas



Iris pseudocorus

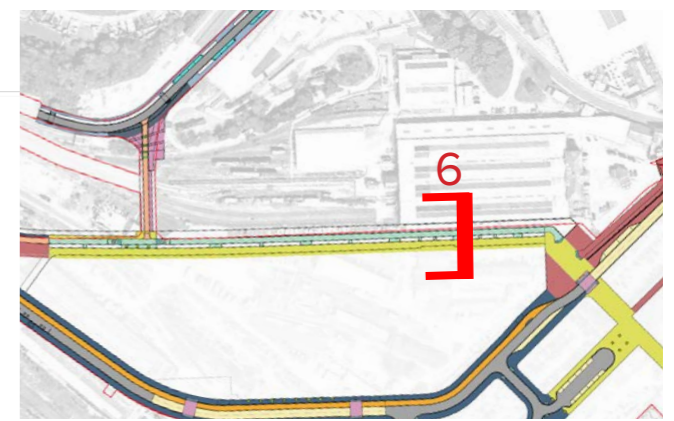
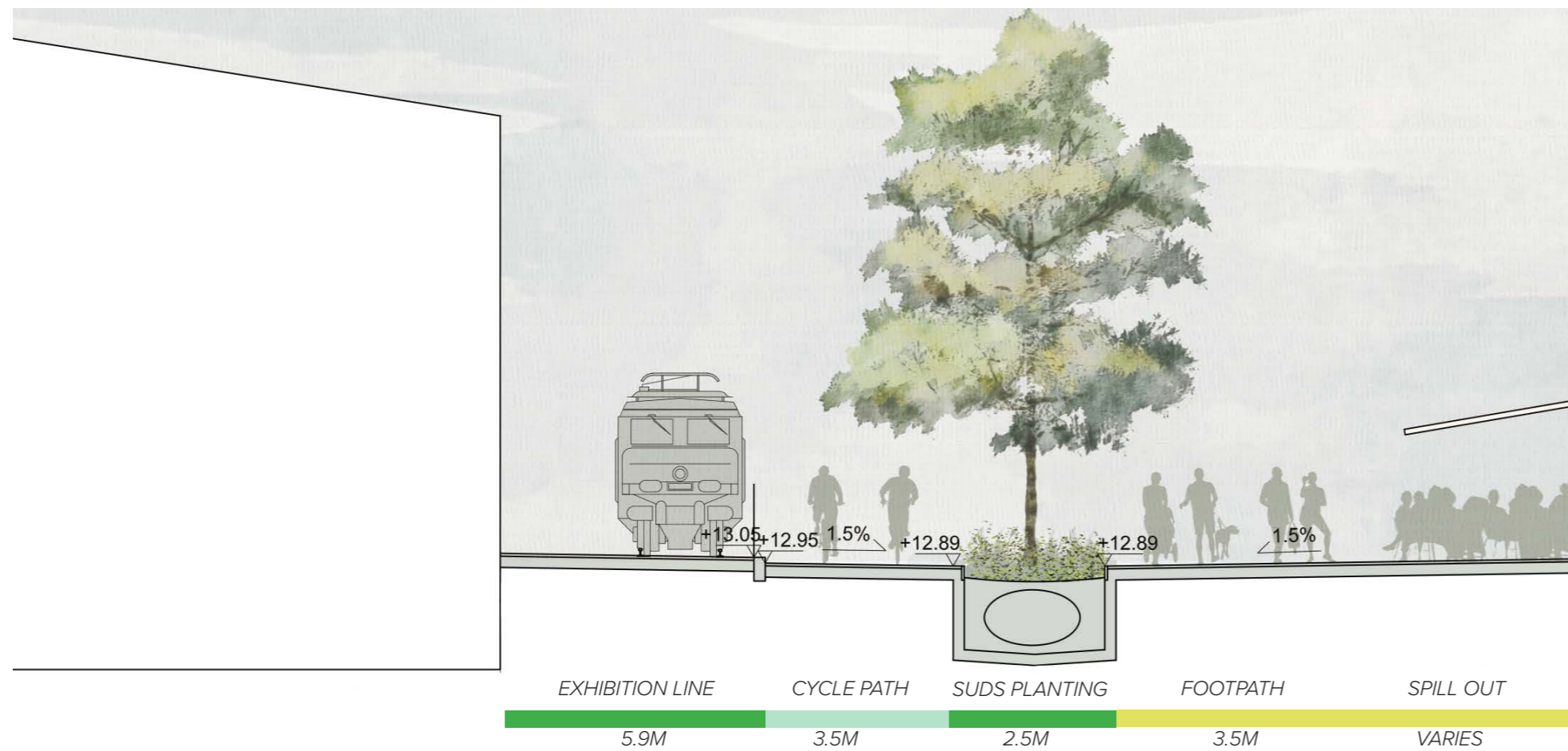
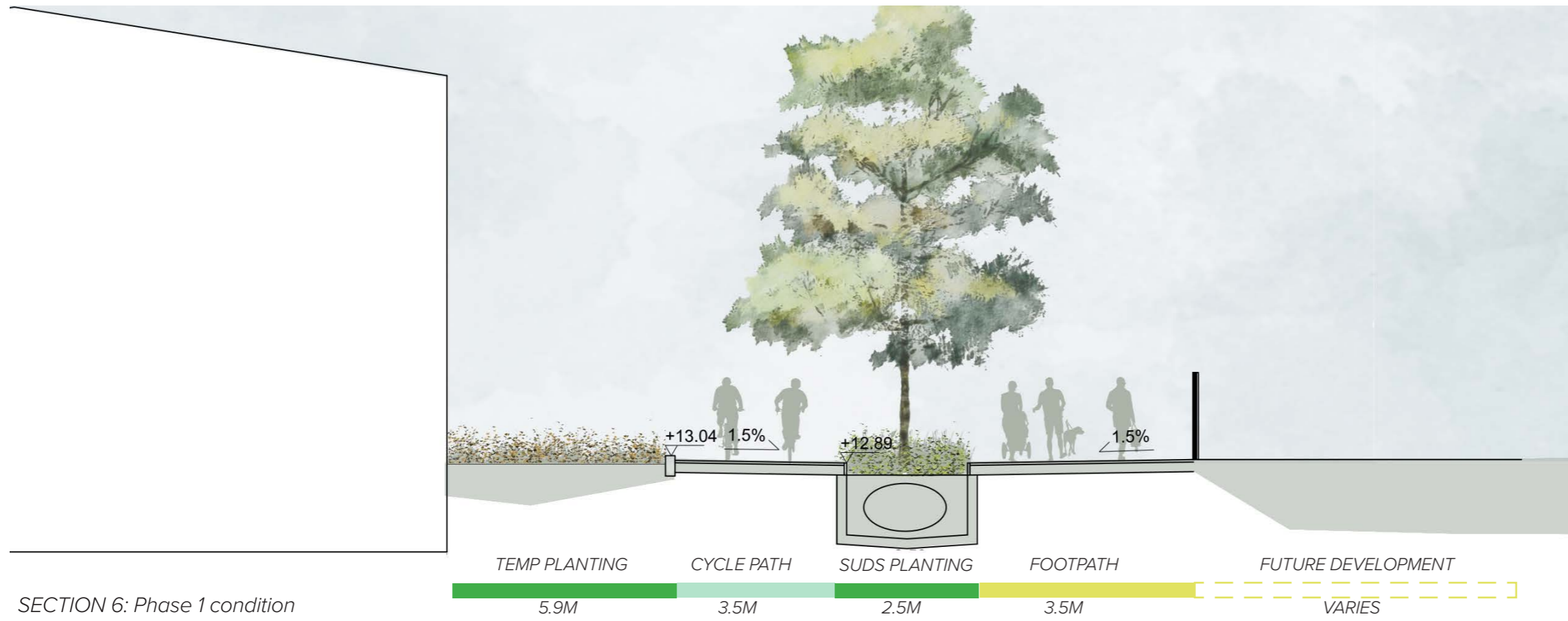


Achillea millefolium



Rudbeckia fulgida

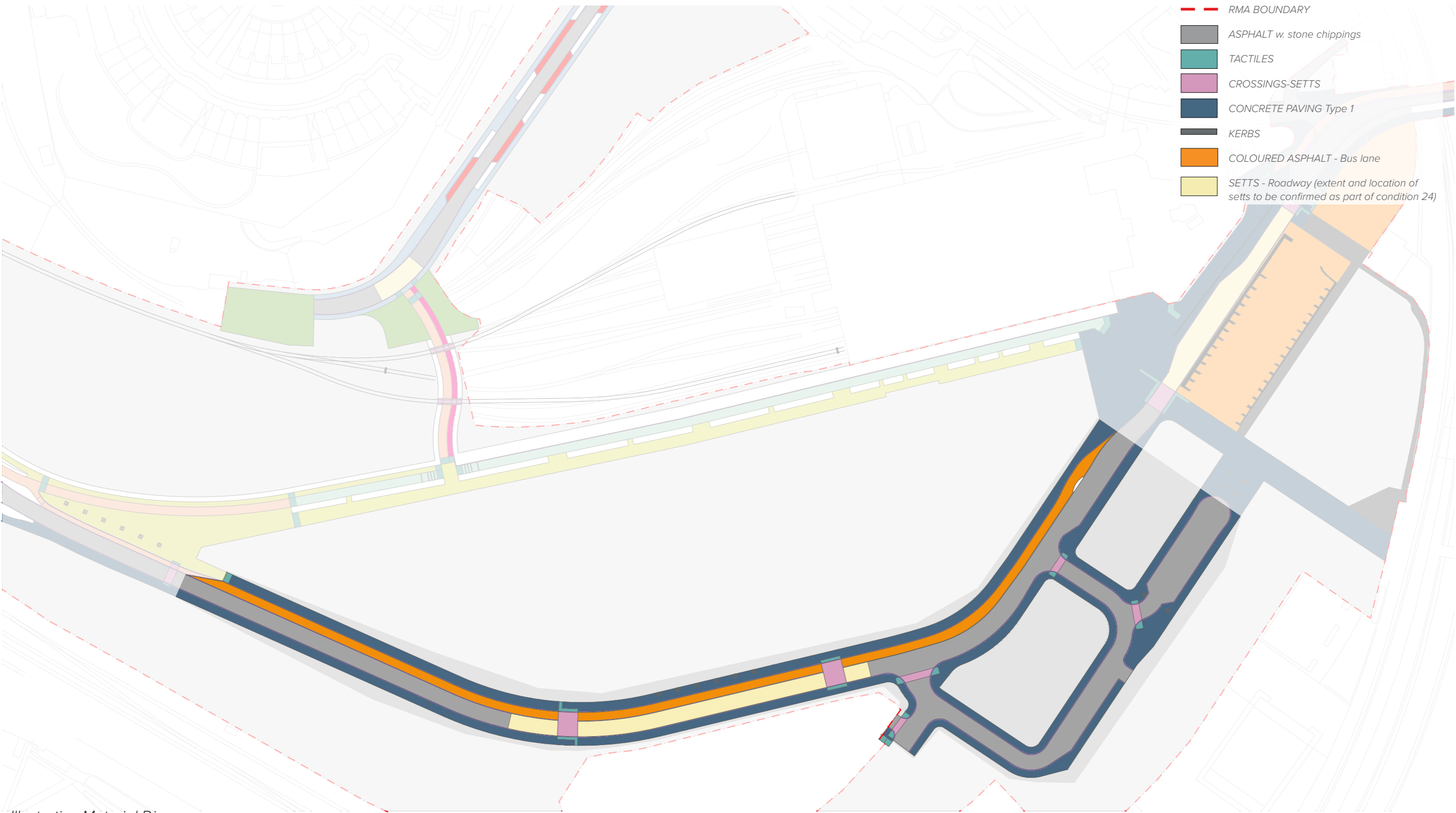
Understory planting strategy



5.4 Detailed Character Areas

5.4.4 Station Quarter

General Arrangement - Hardscape



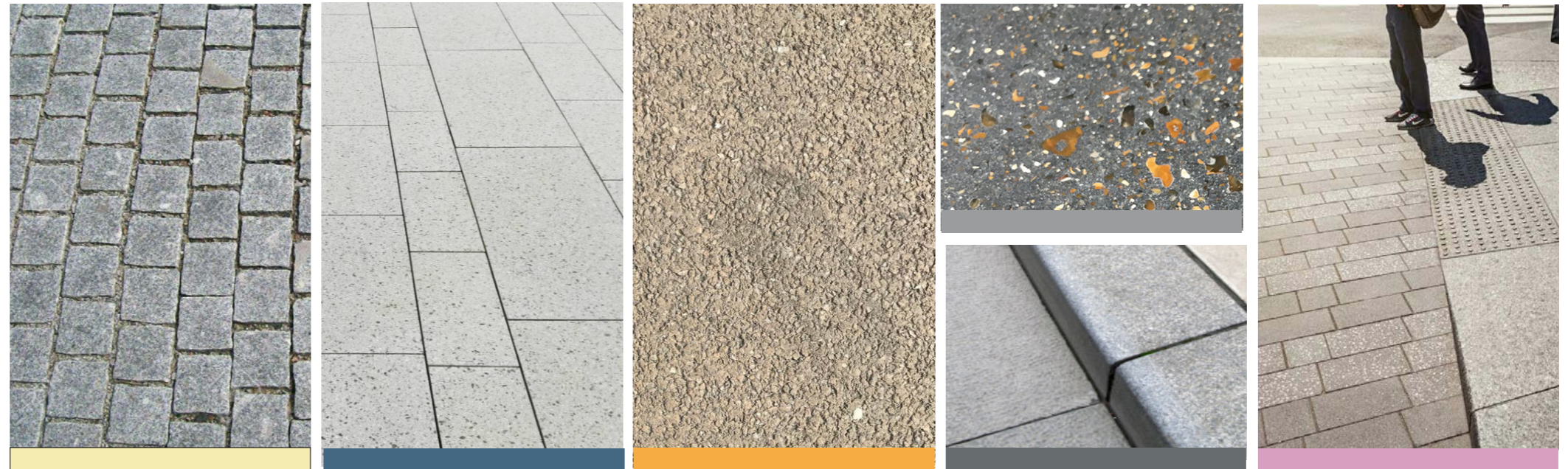
Illustrative Material Diagram

Material Strategy

Cinder street will bear a very similar material character to that of Park Street. The road surface, footway paving, kerbs, parking bays and pedestrian crossings, will all reflect the material character of the preceding road alignment.

However, the road surface will alter in an 80m stretch of roadway located between two main pedestrian crossings, one of them signalised. Here rough cut stone setts will be used to pave the roadway. This will serve to slow traffic through this corridor and create a more pedestrian friendly environment between to future proposed urban squares in the York Central masterplan. Extent and location of setts to be confirmed as part of condition 24.

Along Cinder street, cyclists will transition from the segregated cycleway, onto the carriageway. This creates space for a segregated bus lane, situated on the northern side of Cinder street. This bus lane will be demarcated by buff tinted asphalt laid onto the road surface. This surface will be separated from the carriageway by a flush kerb.



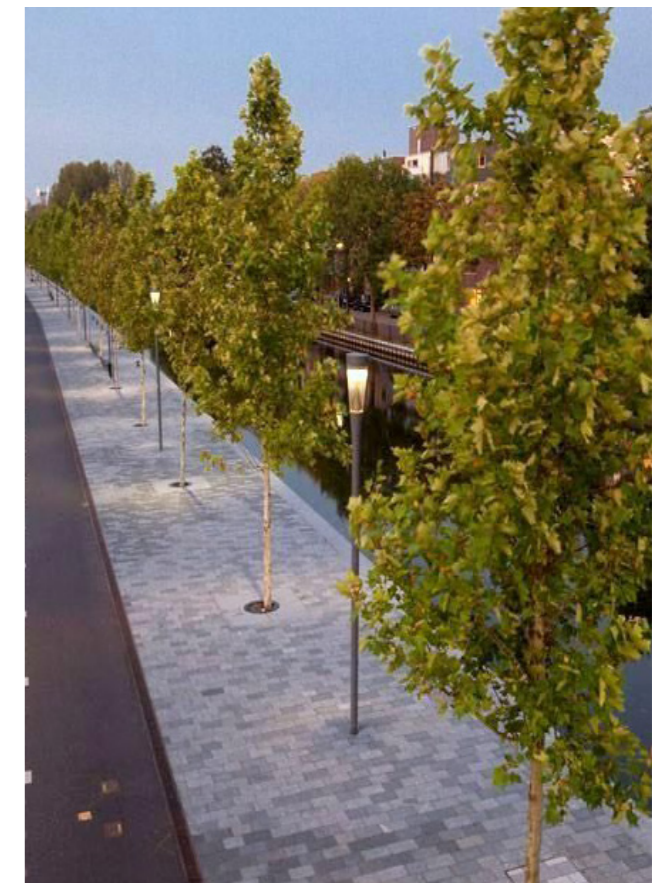
Overall Materials Palette



Precedent image edge treatment



Shared cycle way



Precedent image of urban tree planting

5.4 Detailed Character Areas

5.4.4 Station Quarter

CIVIC PALETTE TREE PITS: Precedent images of recessed tree pits



Precedent image- Recessed tree pit



Precedent image- Recessed tree pit

STONE TACTILES: Controlled and uncontrolled crossings



Precedent image- Controlled crossing



Precedent image- Uncontrolled crossing









1: Controlled crossing: Main route towards Southern Access bridge

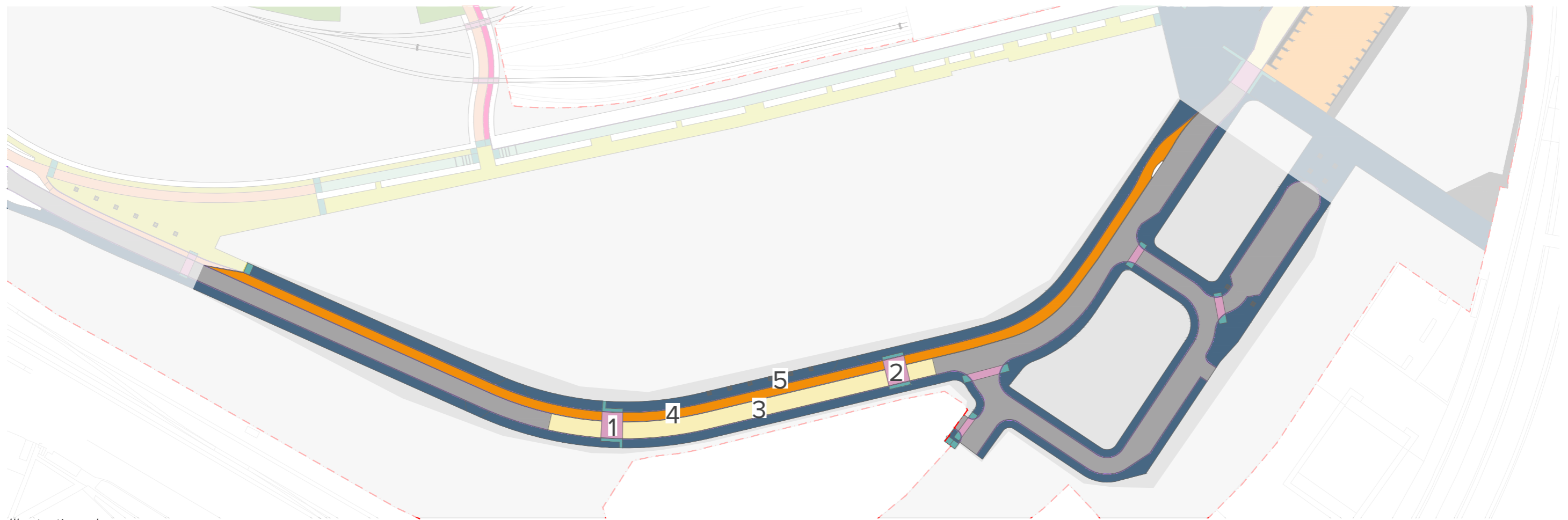
2: Uncontrolled pedestrian crossing

3: Cropped natural grey stone setts within roadway (extent and location of setts to be confirmed as part of condition 24)

4: Coloured asphalt to separate bus and cycle movement

5: Recessed tree pits within hard landscape

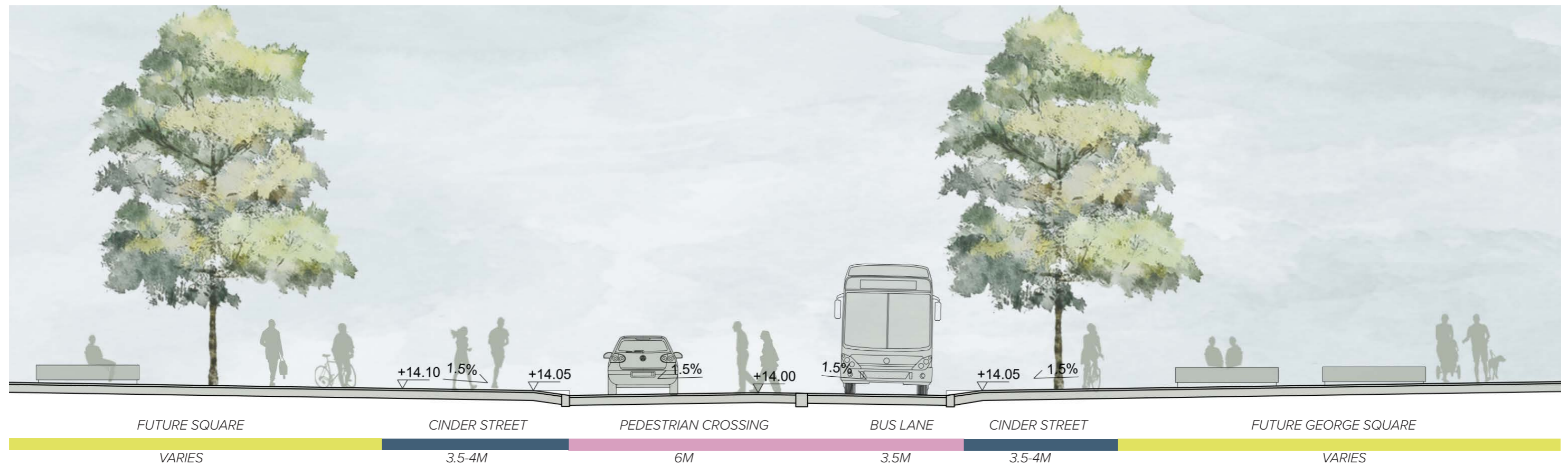
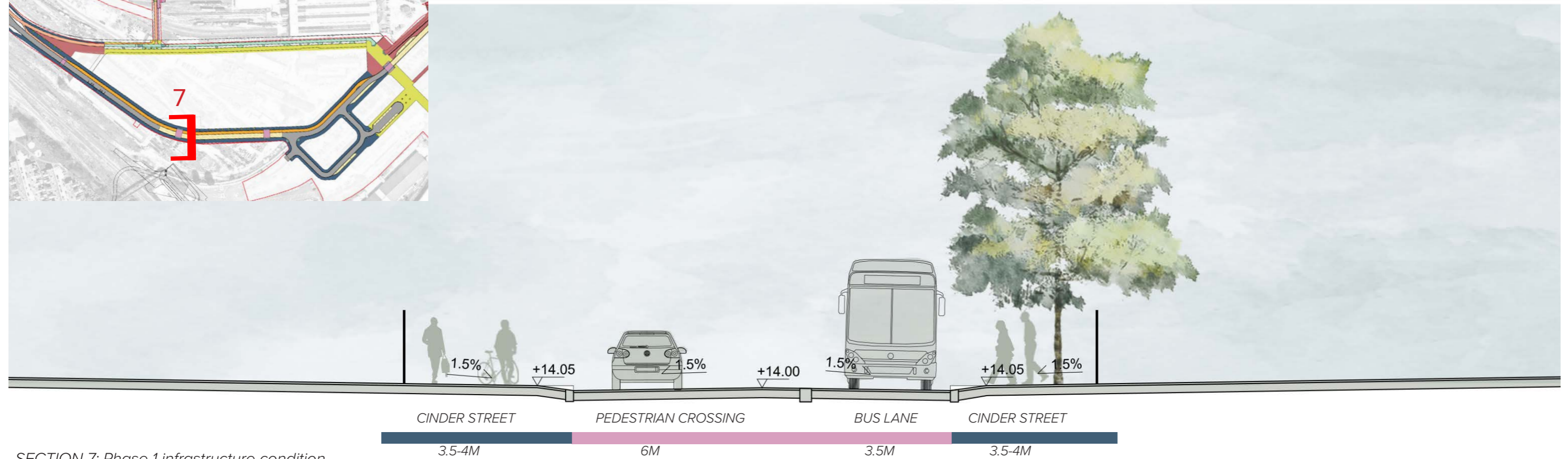
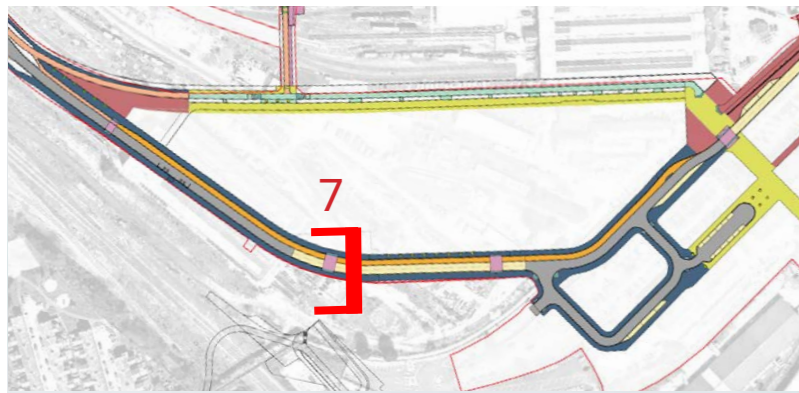
-  RMA BOUNDARY
-  ASPHALT w. stone chippings
-  TACTILES
-  CROSSINGS
-  CONCRETE PAVING Type 1
-  KERBS
-  COLOURED ASPHALT - Bus lane
-  SETTS - Roadway (extent and location of setts to be confirmed as part of condition 24)



Illustrative plan

5.4 Detailed Character Areas

5.4.4 Station Quarter

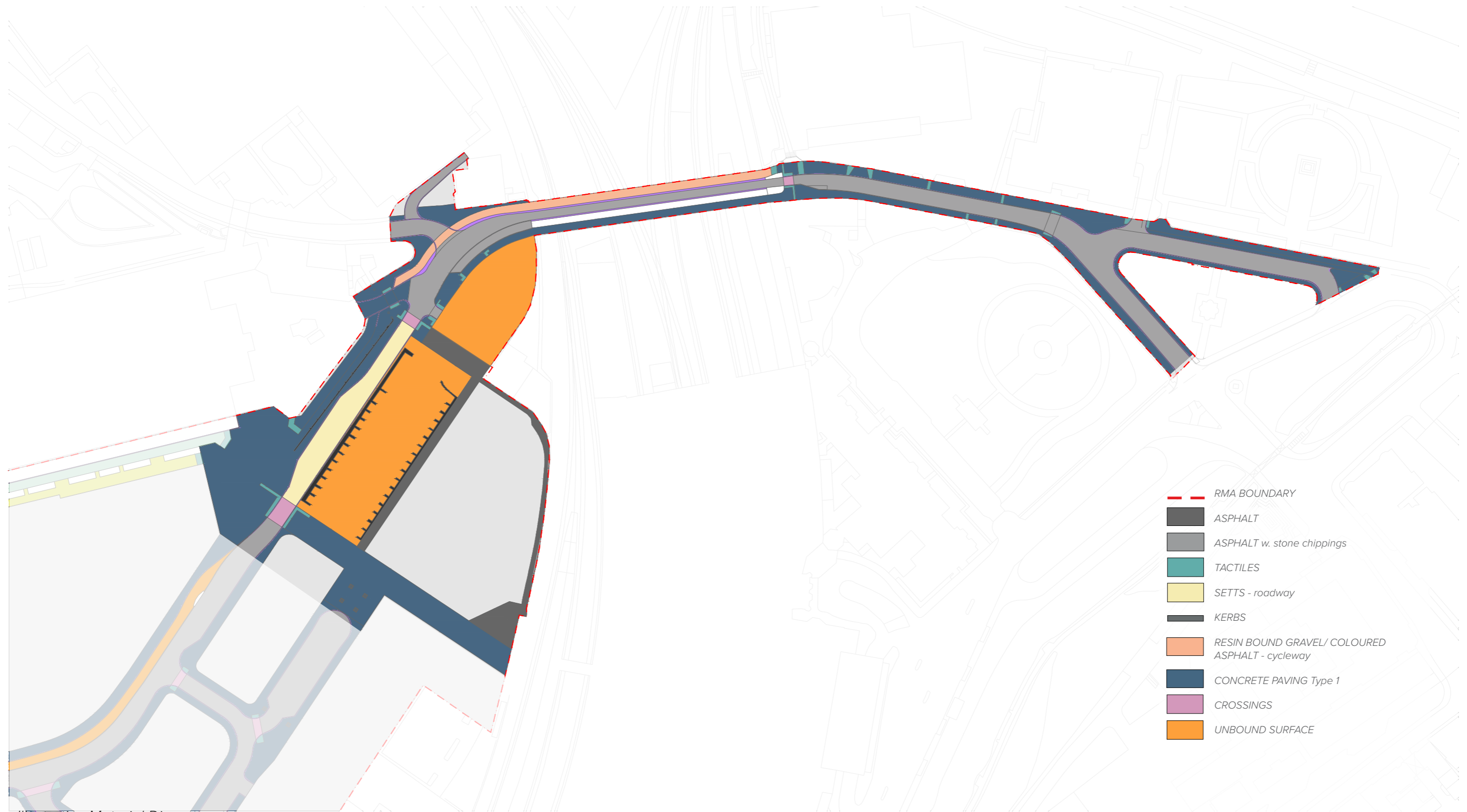


SECTION 7: Master plan condition (i.e. when the wider plots are delivered)

5.4 Detailed Character Areas

5.4.5 Museum Quarter

General Arrangement - Hardscape



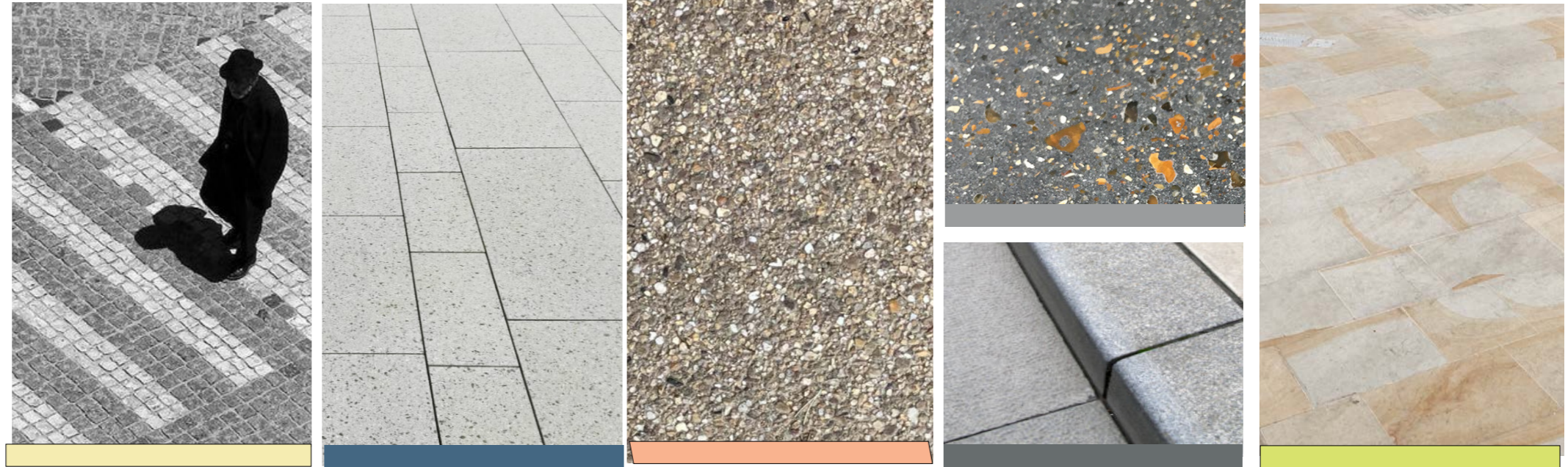
Illustrative Material Diagram

Material Strategy

The proposed materials strategy within the museum quarter is designed to create both clear and functional spaces. A simple palette of materials aims to produce a holistic design which corresponds with the railway heritage surroundings.

When reaching the square, low speed limits are encouraged through the changes in the road surface to natural stone setts paving. The main pedestrian area uses high quality concrete block paving which will be replaced with natural stone once the whole design of the square is implemented.

Resin bound gravel or coloured asphalt is used in the cycle way giving continuity throughout the whole development.



Overall Materials Palette

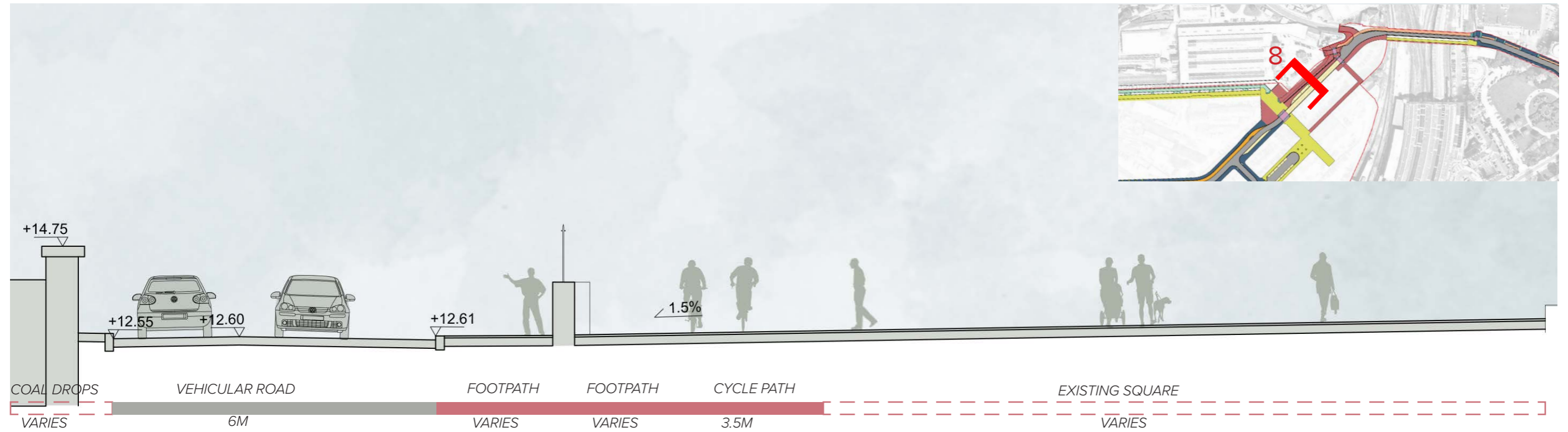


Precedent image of a square in front of a listed building

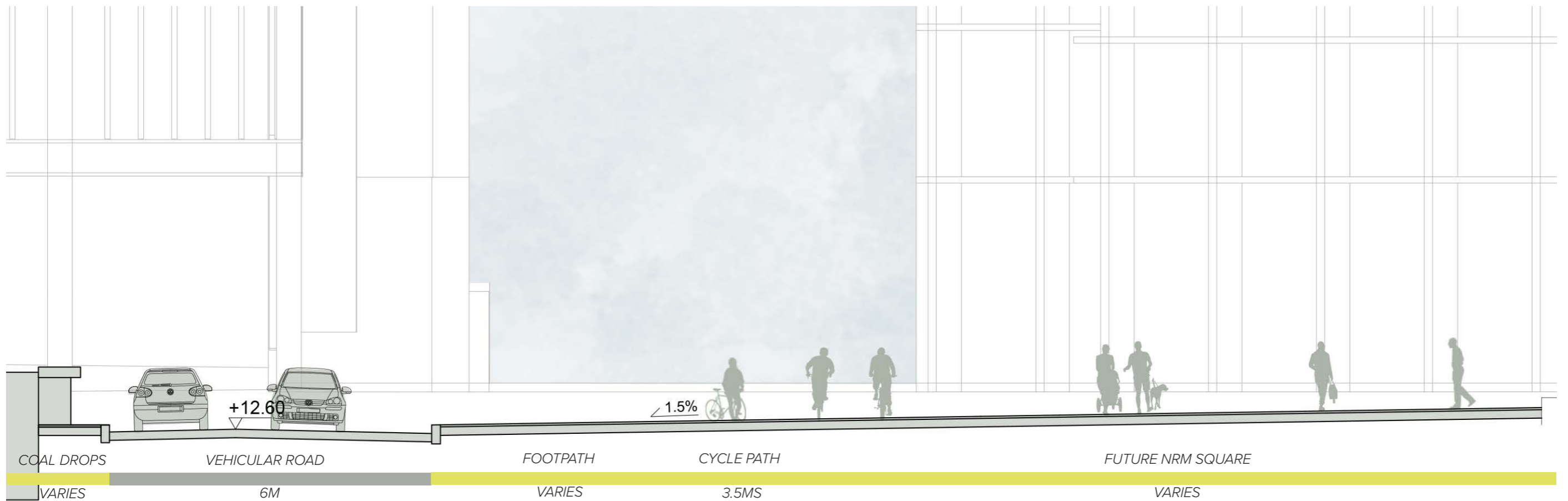


5.4 Detailed Character Areas

5.4.5 Museum Quarter



SECTION 8: Phase 1 condition

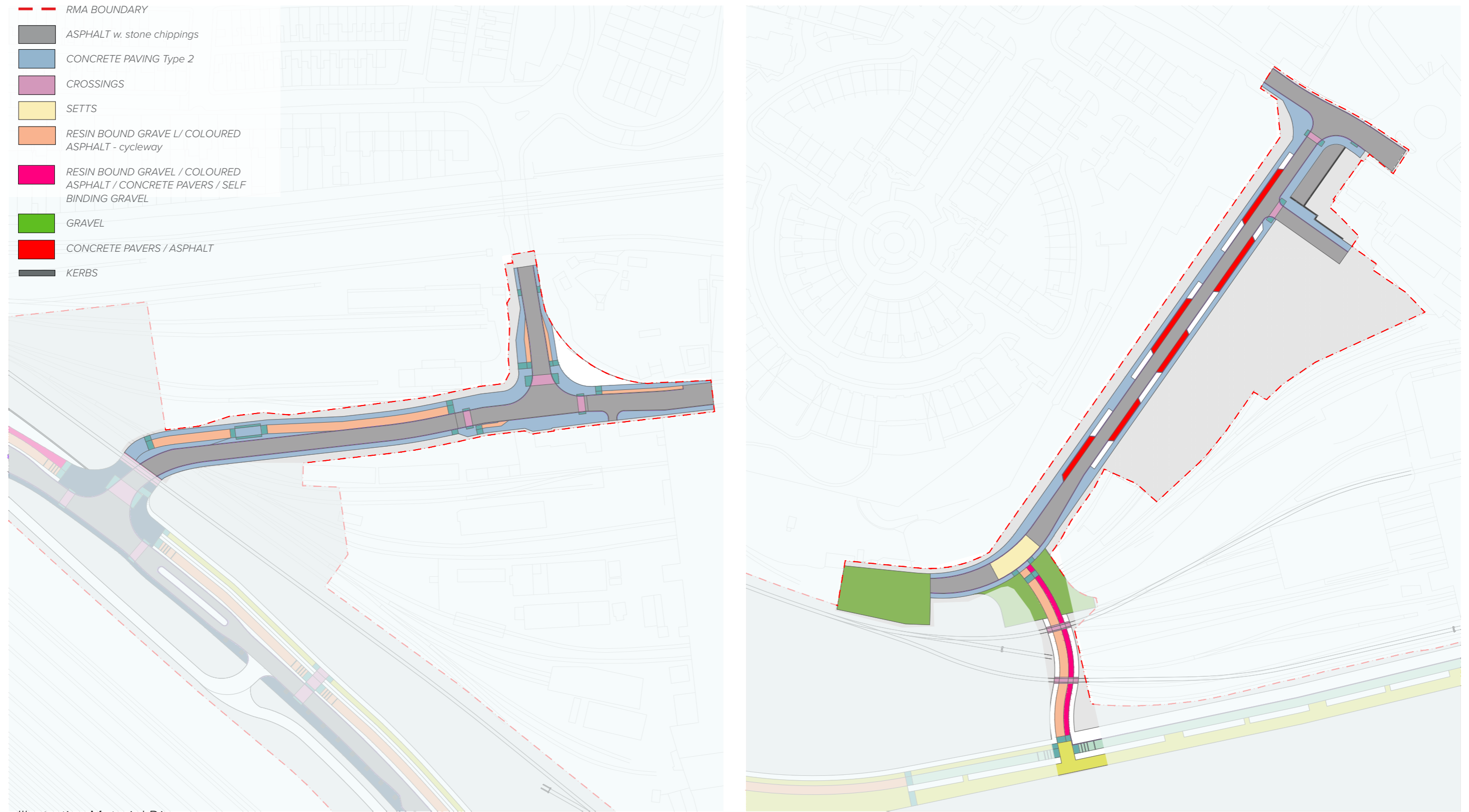


SECTION 8: Master plan condition (i.e. when the wider plots are delivered)

5.4 Detailed Character Areas

5.4.6 Concrete Depot, Foundry Way and Leeman Road Link

General Arrangement - Hardscape



Illustrative Material Diagram

Materials Strategy

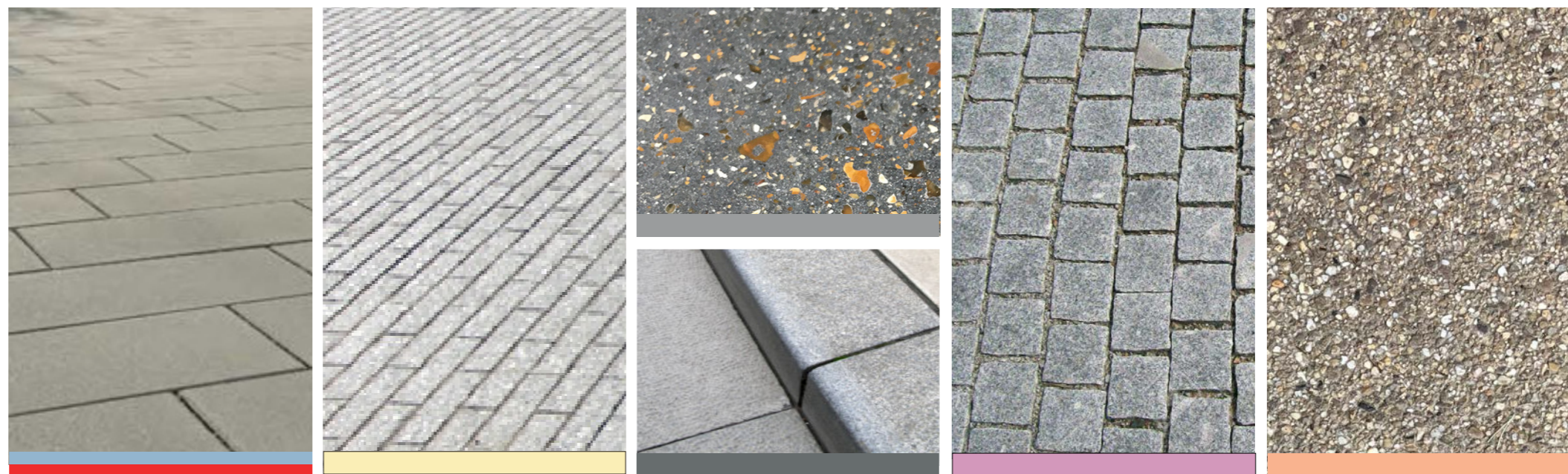
The materiality of the Concrete Depot, Foundry Way and Leeman Road are strongly shaped by the historical industrial use of the site and are consistent with the Residential Material Palette outlined in the York Central Design Guides. As such the majority of the surface materiality for the streetscape and pedestrian link is proposed as concrete pavers, in varying finishes and unit sizes.

Large unit concrete pavers will be utilised on the footpaths across the streetscape. These will be trafficable where necessary to provide maintenance vehicular access through the Concrete Works link, and across the eastern corner of the junction at Leeman Road. These trafficable sections will also require a flush kerb.

Small precast concrete setts or asphalt will be used to delineate the parking bays, from the asphalt roadway.

The cycleway will be laid with resin bound gravel or coloured asphalt as per Park Street and provide a smooth and distinct path for cyclists.

The roadway asphalt and kerbs will match the rest of the development.



Overall Materials Palette



Precedent image edge treatment



Shared cycle way

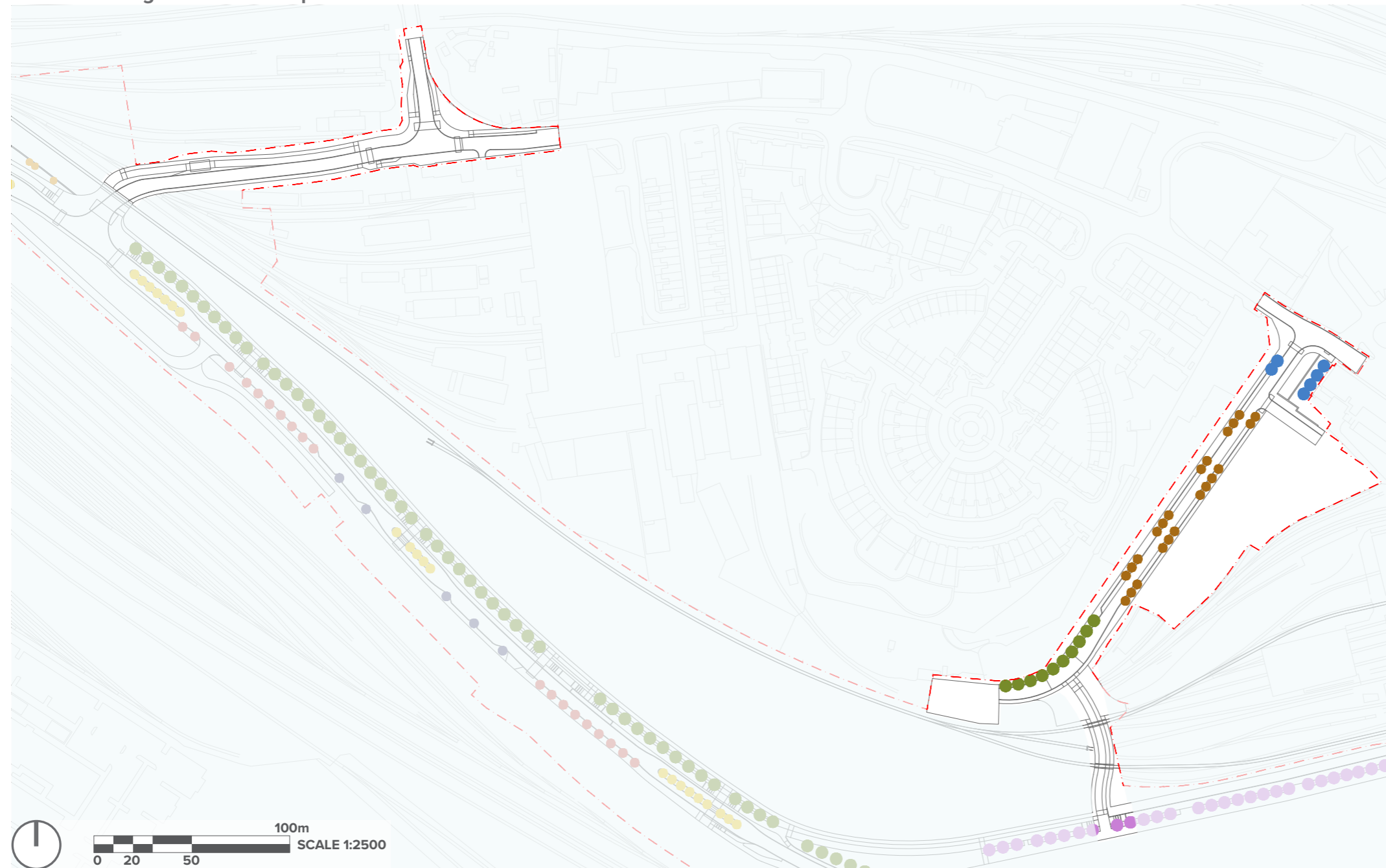


Precedent image of urban tree planting

5.4 Detailed Character Areas

5.4.6 Concrete Depot, Foundry Way and Leeman Road Link

General Arrangement - Softscape



--- RMA BOUNDARY

● FOUNDRY WAY (PARK SECTION) TREES (e.g. *Quercus robur*, *Acer pseudoplatanus*, *Fagus sylvatica*)

● FOUNDRY WAY (RESIDENTIAL SECTION) TREES (e.g. *Alnus glutinosa*, *Acer campestre*, *Gleditsia triacanthos*, *Sorbus aucuparia*)

● GATEWAY TREES (E.g. *Ginkgo biloba*, *Liquidambar styraciflua*, *Liriodendron tulipifera*)

The street tree planting strategy seeks to reinforce the major spatial typologies along Foundry Way, through distinct street tree planting. The first major zone is the Foundry Way Gateway, which will be planted with a bright, distinct species to emphasize one's entrance into the development.

The second zone is the stretch of streetscape adjacent to the Concrete Depot residential developments. Here a smaller domestic scale species will be planted, in tree planting trenches alternating with parking bays.

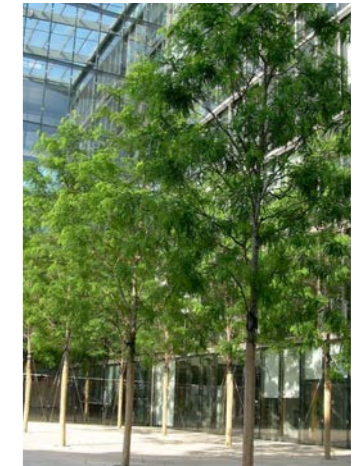
The third zone occupies the stretch of Foundry Way facing Central park. Here a larger tree species is planted to match the scale of the park-side trees.

The understorey planting within the development will reflect the various typologies outlined in the street tree planting strategy.

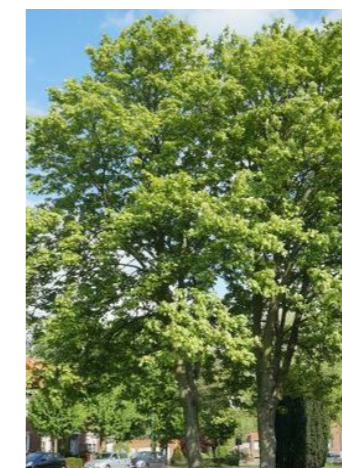
Verge planting along Foundry Way will transition from a more residential planting palette with ornamental, flowering perennials to a more native palette, with herbaceous planting alongside the stretch of roadway facing Central Park.



Acer campestre



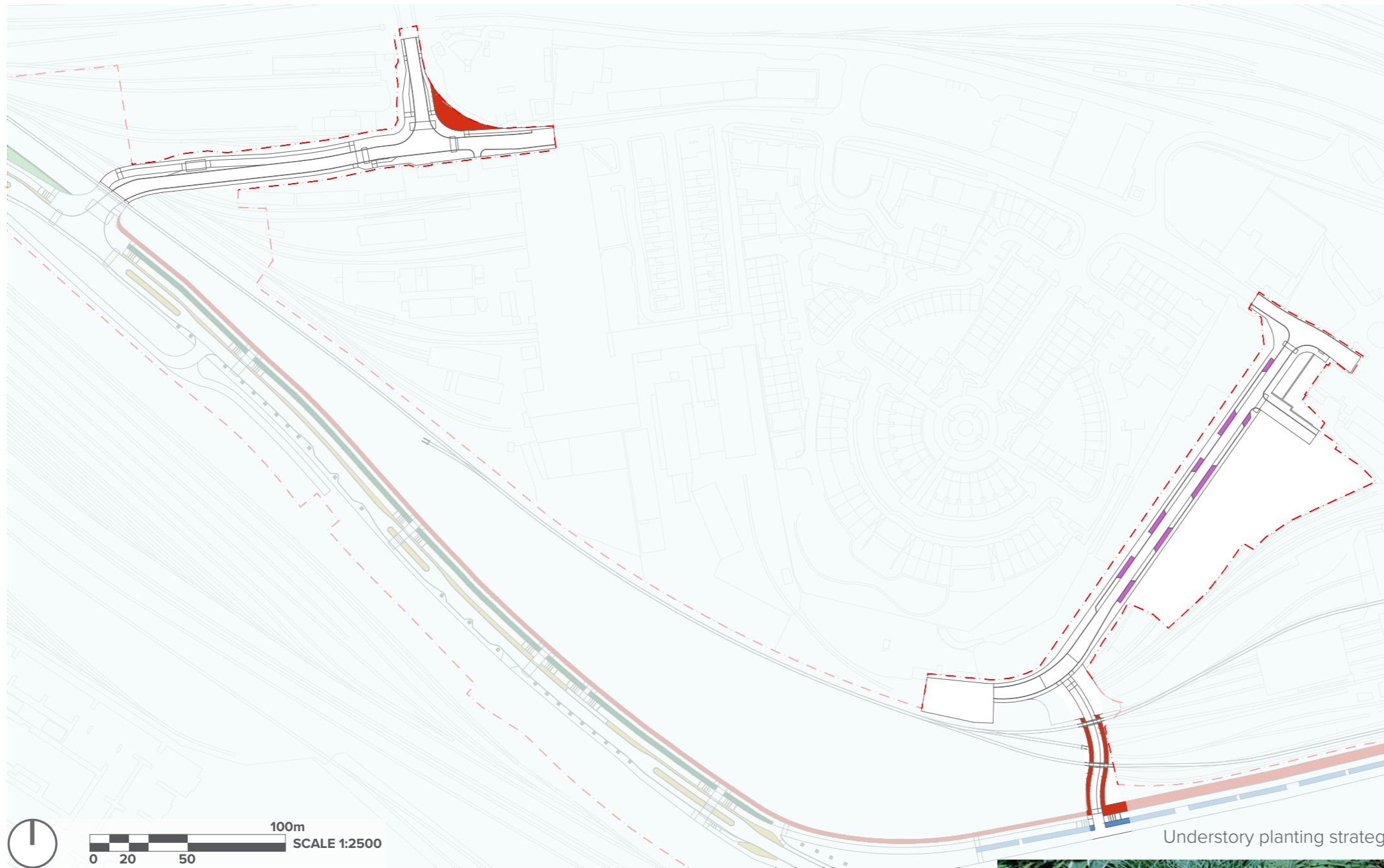
Gleditsia triacanthos



Acer pseudoplatanus



Sorbus aucuparia



— RMA BOUNDARY

VERGE PLANTING FOUNDRY WAY (e.g. Dryopteris filix-mas, Herrenhausen Oregano, Euphorbia characias, Achillea millefolium, Cenolophium denudatum)

TEMPORARY PLANTING (Wildflower meadow)



Cenolophium denudatum



Achillea millefolium



Euphorbia characias



Dryopteris filix-mas



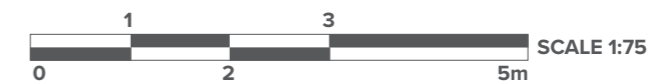
Herrenhausen Oregano

5.4 Detailed Character Areas

5.4.6 Concrete Depot, Foundry Way and Leeman Road Link



SECTION 9: Phase 1 condition



5.5 Secure by Design

A fundamental aim and objective of the scheme is to create a safe environment for all members of the public.

The highway design has been subject to a Stage 1 and Stage 2 Road Safety Audit. These Road Safety Audits were undertaken by an independent designer to identify residual design risks and recommendations to improve the design. The design has then subsequently been updated to integrate the recommendations provided.

All areas of Phase 1 infrastructure will provide a good natural surveillance from existing and future nearby dwellings to provide guardianship.

Amenity space around the site will be subject to an effective maintenance plan to address issues such as litter removal, grass cutting, trimming and pruning shrubs and trees. A well-managed place reduces the feeling of insecurity by acting on the consequences of crime and vandalism. A high level of maintenance contributes to a welcoming atmosphere, which satisfies the users and promotes respect for the site.

The landscape design reinforces the sense of security with a strategy of maintenance and defensible planting to deter criminal activity.

The two bridges have been designed to provide a safe environment for pedestrians, cyclists and drivers. They both have a clear and legible alignment for every type of user and have been conceived to protect non-motorised users (NMU) from vehicles, and to maximise visibility and natural lighting. The parapet of both bridges will protect people using the bridge from the railway environment and, reciprocally, train users from people on the bridge.

In the case of the East Coast Main Line Bridge, as opposed to many other bridges over the railway, the requirements of vehicle containment and prevention from people getting injured or committing vandalism, are split into two systems instead of being performed by a single one located at the bridge edges. The required very high vehicle containment barriers (H4a in accordance to BS EN 1317-2) to avoid road vehicles obstructing the railway, are located at the road edges and the pedestrian parapets are located at the bridge edges. This approach improves pedestrian and cyclist safety and, thanks to the use of glass pedestrian parapets, increases natural light on the pavements.

These pedestrian parapets, made up of 1.8m-high glass panes with sealed joints, prevent from people climbing them and falling onto

the railway area, objects being thrown from the bridge, or people contacting uninsulated elements of the overhead line electrification system with objects.

The sequence of vertical steel plates out of the glass panes at the edges of the bridge, which help for the stability of the glass system (some of them being also part of the main structural layout), provides a dynamic perception that moves from opaquer when seen in skewed views to more transparent when seen in orthogonal ones. Thanks to this, pedestrians who feel less comfortable crossing over a railway will have a certain protection feeling, while those interested in observing the trains and the railway infrastructure will have an opportunity to do so (by stopping and looking for a framed view in between plates).

The design of the parapet of the Severus Pedestrian and Cyclist Bridge shares similar principles with those of the East Coast Main Line Bridge, the width of the deck allowing for those users less comfortable crossing over the railway to walk closer to the opaque main girder (northern edge of the bridge deck), achieving an extra protection feeling. The Vehicle Restraint System at the edges of the Severus Road Bridge protects pedestrians and cyclists from vehicle impact.

Both bridges incorporate timber claddings covering the most prominent surfaces of their structure or impact barriers facing the NMU environment. They create a pleasant high-quality space for low-speed users that will reduce the feeling of insecurity. These cladding systems have also been designed to prevent people from climbing them.

Both bridges have a functional lighting system that will allow for a safe environment during night-time for every type of user.

6 BRIDGES

6. Introduction

6.1. East Coast Main Line Bridge

6.1.1 Design approach

6.1.2 Options considered

6.1.3 Preferred design

6.1.4 Form

6.1.5 Materials and finishes

6.1.6 Lighting

6.2. Severus Pedestrian and Cycle Bridge and Severus Road Bridge

6.2.1 Design approach

6.2.2 Options considered

6.2.3 Preferred design

6.2.4 Form

6.2.5 Materials and finishes

6.2.6 Lighting

6 Introduction

EAST COAST MAIN LINE BRIDGE & SEVERUS PEDESTRIAN AND CYCLE BRIDGE

INTRODUCTION

The arrival of the railway to York in 1839 made a large area of countryside become a major railway interchange first, and the home of many rail-related activities in subsequent years. As a consequence of these activities, many parts of the area were restricted to rail uses for more than 150 years, making it inaccessible, isolated and unpleasant to residents in the proximities. This brownfield land will still be surrounded by railway lines when developed into York Central, significant new infrastructure being needed to open it up. The main piece of infrastructure is the new western access route through to the city from Water End (Phase 1 Infrastructure) which includes two new bridges over the railway: an exclusively pedestrian and cyclist bridge parallel to the existing Severus Road Bridge (from now Severus Pedestrian and Cycle Bridge) and a road bridge (East Coast Main Line Bridge or ECML Bridge) south of Millennium Green. This new road will become the key route for public transport with segregated paths for pedestrians and cyclists.



Location of the East Coast Main Line Bridge and Severus Pedestrian and Cycle Bridge within the Phase 1 Infrastructure

6 Introduction

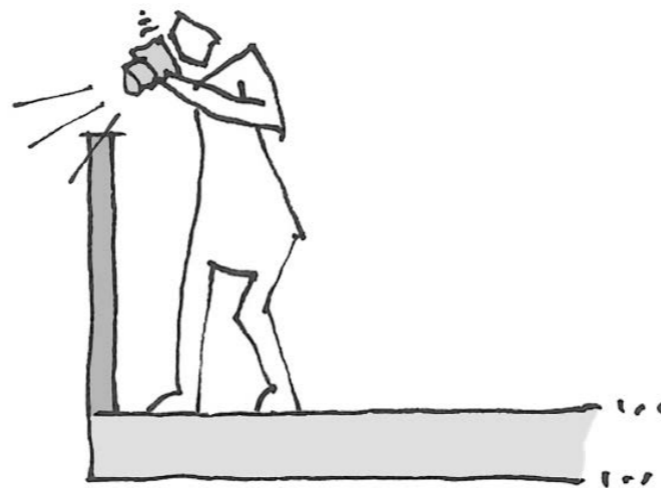
EAST COAST MAIN LINE BRIDGE & SEVERUS PEDESTRIAN AND CYCLE BRIDGE

VIEWS FROM BOTH BRIDGES

The current Severus Road Bridge allows views towards the York Minster. An aspiration for the design of the Severus Pedestrian and Cycle Bridge and the East Coast Main Line Bridge is to facilitate and enhance views of the Minster for bridge users from the southern and eastern sides of the structures, respectively.

The celebration of the importance of the railway in York is one of the key ideas of the overall Masterplan for York Central and the southern pavement of the current Severus Road Bridge is nowadays a popular spot for train enthusiasts to enjoy the railway environment. For these reasons, allowing views of the railway from the two new bridges part of the Phase 1 infrastructure is one of the aims of their design.

Finding the right balance between fulfilling this aspiration for providing views from the bridges and guaranteeing the safety and security for both train users and train observers will be one of the challenges of the design.



Opportunity for train enthusiasts

6 Introduction

EAST COAST MAIN LINE BRIDGE & SEVERUS PEDESTRIAN AND CYCLE BRIDGE

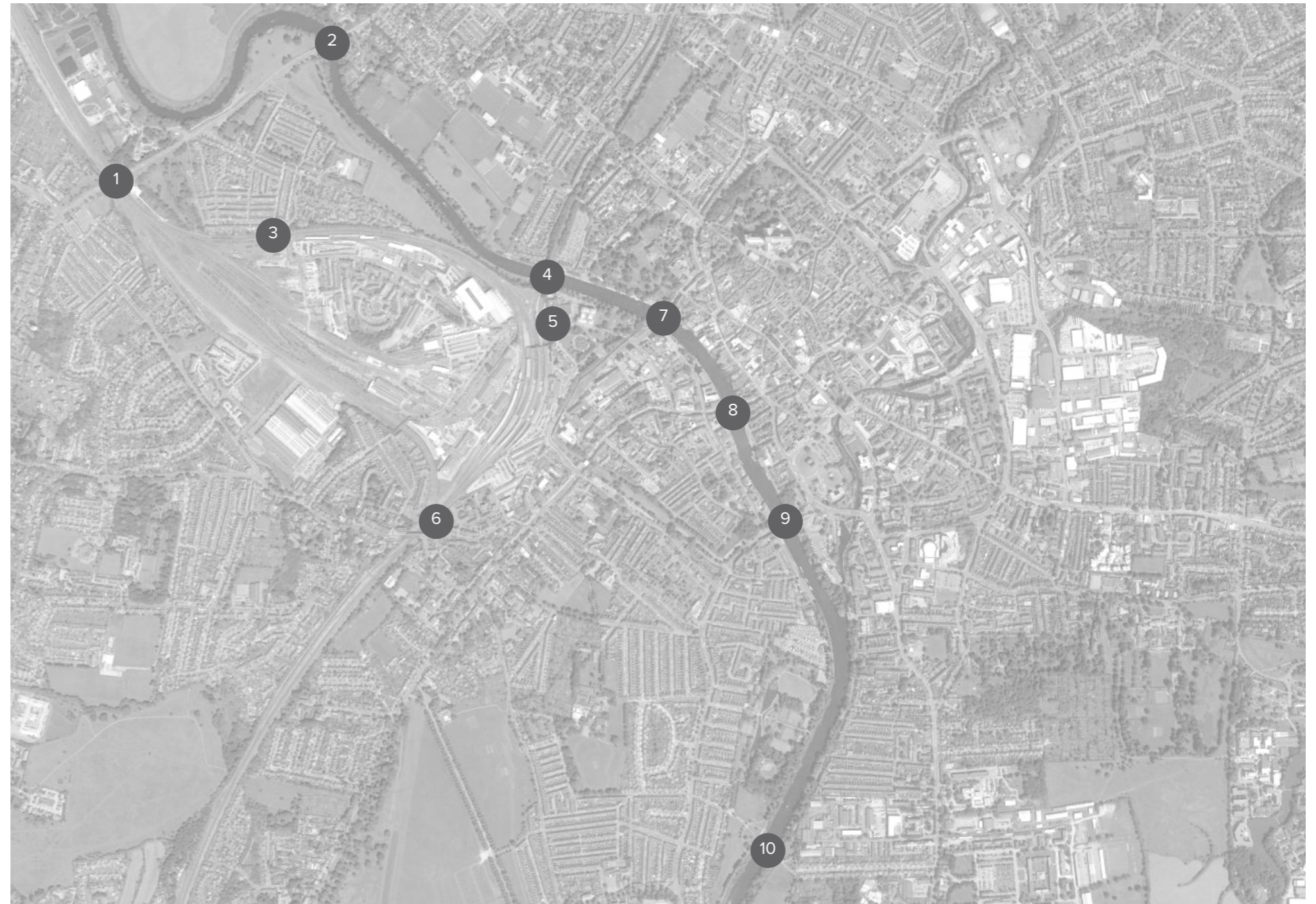
YORK BRIDGES

The family of existing bridges in York is a quite homogeneous one, all the bridges being either arches/frames or beams of different types.

In terms of relevance and history, Lendal Bridge, Ouse Bridge and Skeldergate Bridge would be the most important ones (Grade II listed), followed by the Scarborough Railway Bridge. The Millennium Bridge is also a well know modern addition to this family.

In terms of proximity to the new bridges, the Severus Road Bridge is the most relevant reference, followed by the Marble Arch/Leeman Road Tunnel and the north Leeman Road Bridge. These are references without architectural ambition but with certain character.

The design approach for the new bridges could either continue the current family of structures or opt for the more delicate route of adding a new bridge types to the existing family.



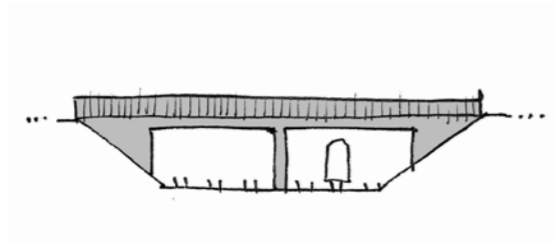
Map of existing bridges in York

6 Introduction

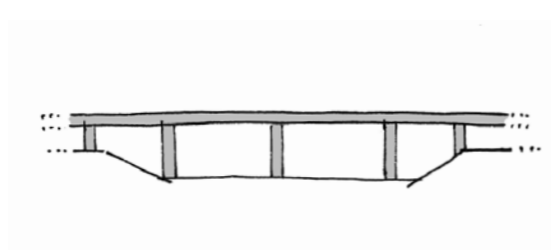
EAST COAST MAIN LINE BRIDGE & SEVERUS PEDESTRIAN AND CYCLE BRIDGE



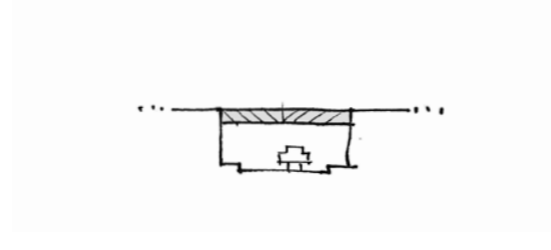
1 - Water End Bridge (above railway)



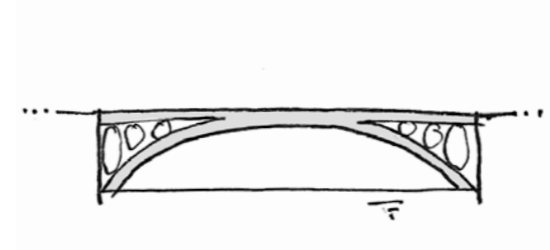
2 - Water End Bridge (above River Ouse)



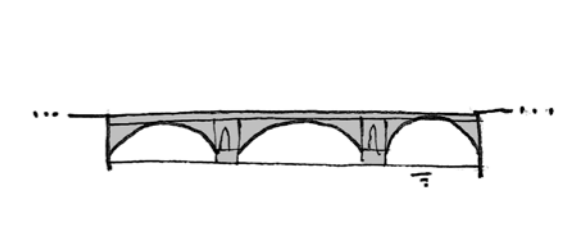
3 - Leeman Road Bridge



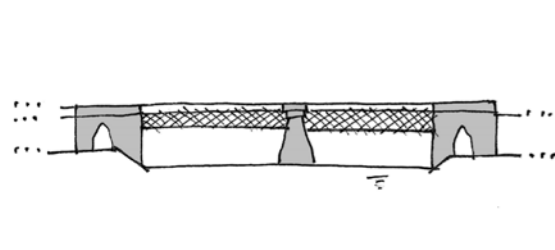
7 - Lendal Bridge



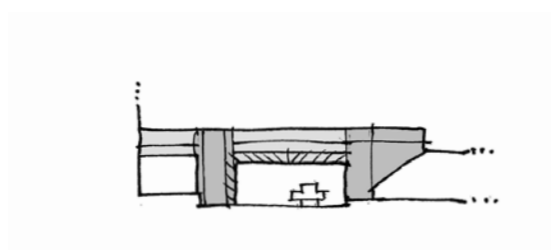
8 - Ouse Bridge



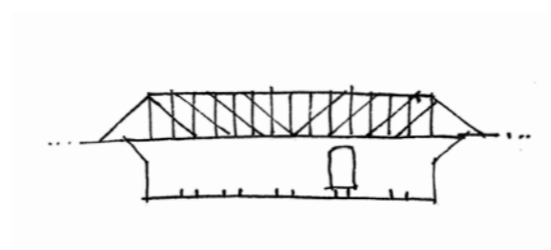
4 - Scarborough Railway Bridge



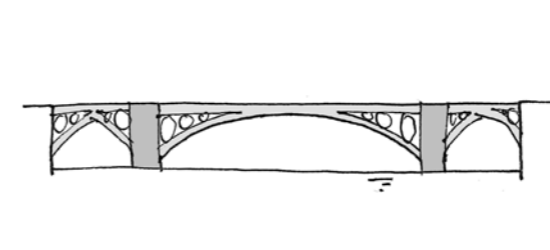
5 - Leeman Road Bridge / Marble Arch



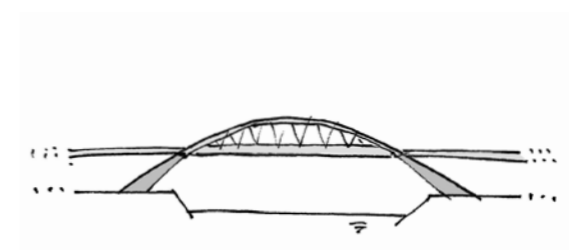
6 - Holgate Road Bridge



9 - Skeldergate Bridge



10 - Millennium Bridge



6.1 East Coast Main Line Bridge

6.1.1 DESIGN APPROACH

RESPOND TO SITE PARTICULARITIES

It is important to understand how the bridge will be perceived from the surrounding neighbourhoods and carefully consider its scale according to the adjacent buildings from the future development.

The views from the houses around Garnett and Garfield Terrace will be close to pure elevation, providing a pleasant background in terms of scale, transparency and treatment of the unavoidable skew, was a key design aspiration.

Considering the relationship with the new buildings of York Central, especially with the adjacent building flats in York Yard South, the correct approach has been considered to not compete. By trying to compete, the design would aim to become a landmark bridge and to attract attention without really succeeding due to its proximity to a high building. In order to have a comparable scale, the bridge would require a scale that would be completely out of proportion of what would be structurally necessary for the scale of the crossing.

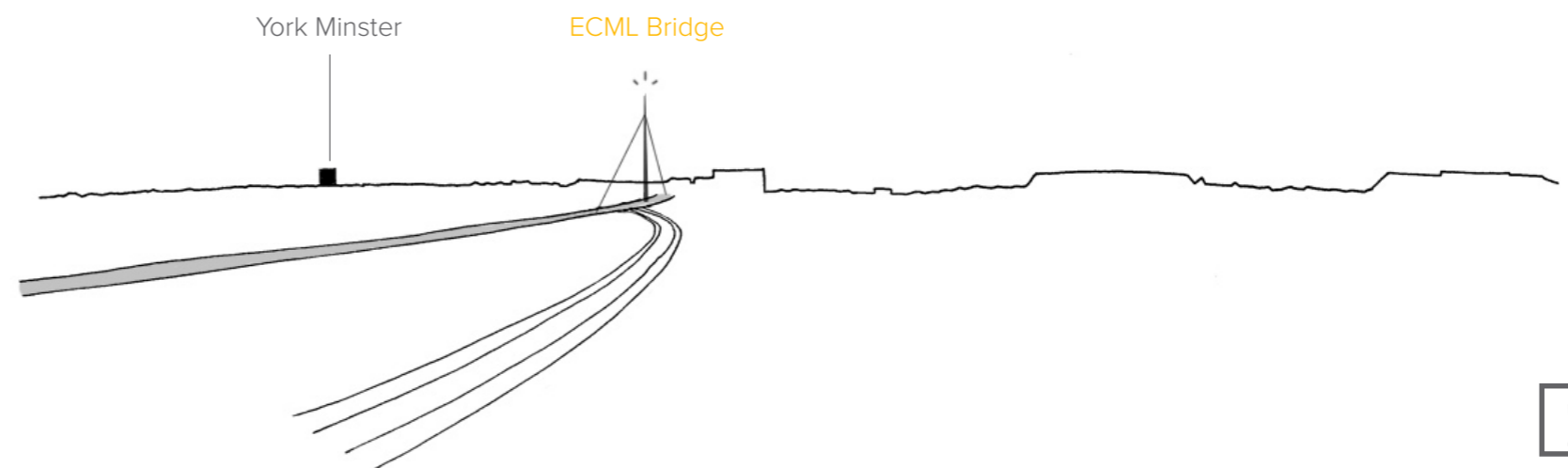
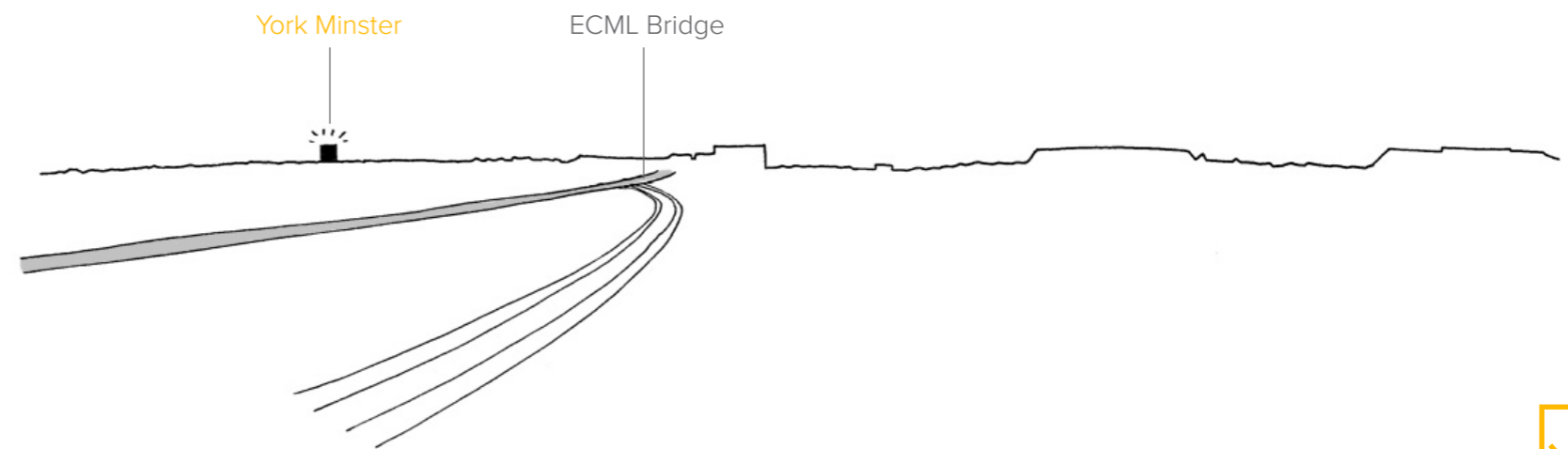
Furthermore, this type of design would conflict with the views of York Minster from the Severus Road and Cycle Bridge, a concern that was raised by Historic England. For these reasons, trying to achieve beauty and elegance, with the right scale is, one of the aims of the design of the new bridge.



View from Severus Road Bridge



York Minster



6.1 East Coast Main Line Bridge

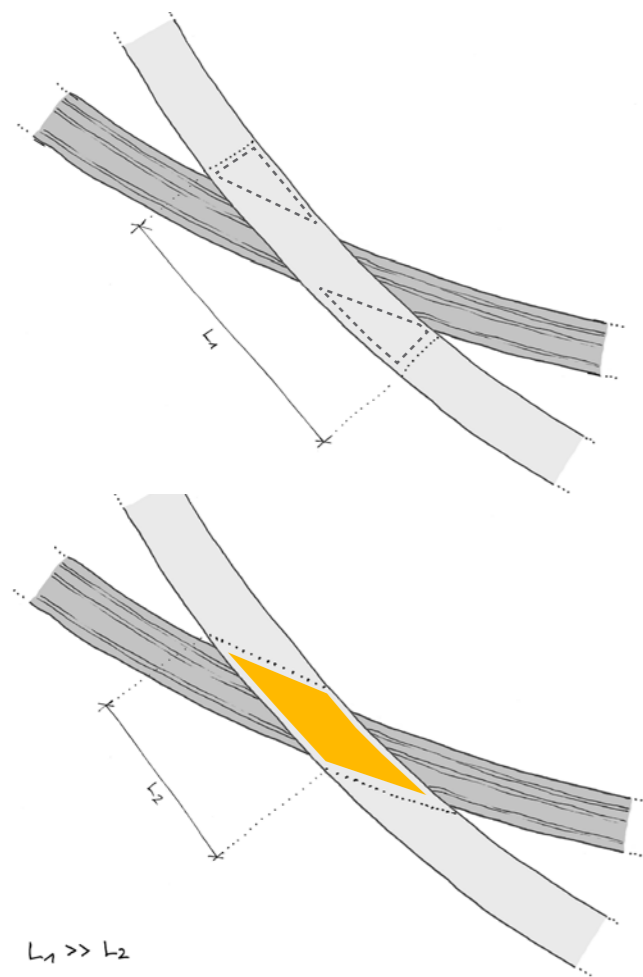
6.1.1 DESIGN APPROACH



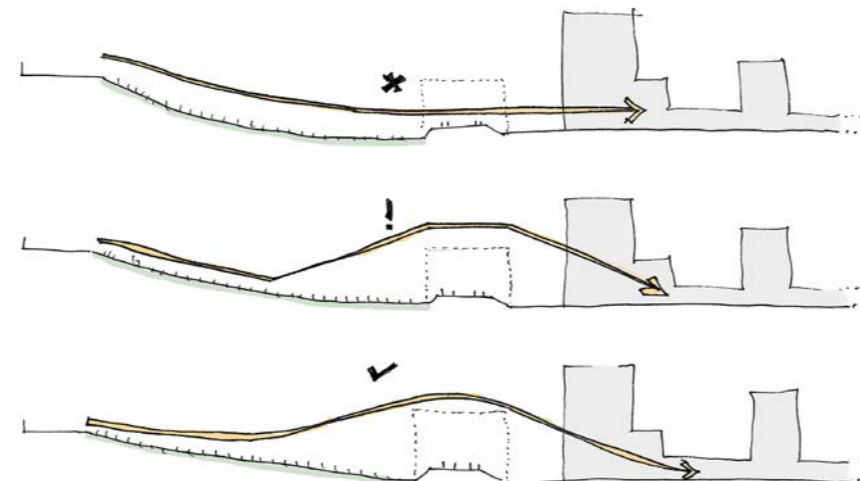
Skewed steel bridge



Skewed brick bridge



Horizontal Road Alignment



Vertical Road Alignment

ROAD LAYOUT

Numerous constraints have informed the overall geometry and the positioning of the new bridge:

- The required clearance above and aside the railway tracks and the overhead line electrification is what determines the vertical alignment of the road. The bridge soffit, having taken into account the structure deflection, must be above the envelope defined by these clearance requirements. This makes it necessary to have ramps on each side of the tracks. The length of these ramps is influenced by the need to have a gradient suitable for users with reduced mobility and cyclists. The 5% gradient used for the design of the road tries to simultaneously address both aspects: comfort for non-motorised users (NMU) and integration within in the townscape as appropriately as possible.
- A key constraint that derives from the plan alignment is the unavoidable high skew between the road and the railway. Ignoring the skew to pursue a crossing with ends that are orthogonal to the road alignment would almost double the length of the bridge and therefore increase the footprint, with consequences in terms of larger areas in shadow and larger portions of deck soffit visible to its users. This approach also means having longer spans, therefore deeper decks, and less inviting unusable (and even unsafe) spaces below the bridge due to the appearance of triangular 'dead' areas in between the obstacle and bridge substructure. These aspects combined create a worse experience for people perceiving the bridge from below.
- Skewed crossings are very representative of railway as an infrastructure. The very strict alignment design parameters of train lines make bridges, spanning over other obstacles, often be skewed. For this reason and because the new bridge will be in an area that aims to celebrate the importance of the railway history of York, acknowledging the skew and trying to make it an important feature of the design seemed to be the appropriate approach. Making the constraint an opportunity to achieve problem-specific designs instead of just ignoring the skew or distorting an originally orthogonal geometry, is an ideal way to face the crossing over the East Coast Main Line.

6.1 East Coast Main Line Bridge

6.1.2 OPTIONS CONSIDERED

Several options were considered for the design of the new East Coast Main Line Bridge. The proposals are presented below.

OPTION 0 - I BASIC BEAM

This option was considered as a reference for other solutions to be compared against. It is a single-span bridge with the structure below the deck, using a composite steel-concrete ladder deck. Its visual depth, resulting from the addition of the structural depth and the height of the parapets makes it look heavy, and abutments and embankments or access walls are high as the road is significantly above the soffit of the bridge.

OPTION 1 - I THROUGH

This option has the whole structure above deck, using a variable-depth trough-beam layout. This is a very traditional railway-related bridge, probably even more frequent for bridges carrying railways than spanning them. The solidity of its external faces gives it a bold, robust and even heavy appearance. The structure itself, thanks to this solidity, fulfils at the same time most of the requirements for parapets on bridges over railway.

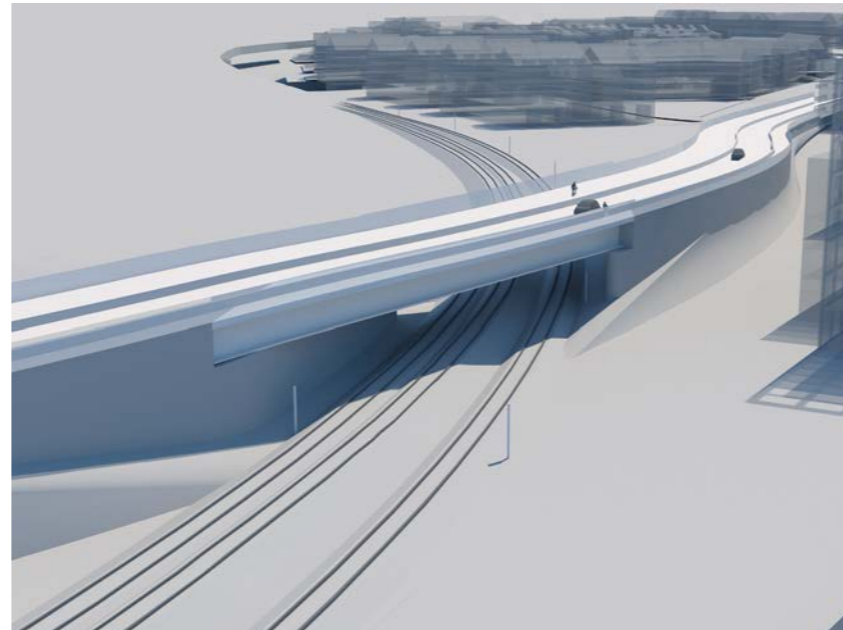
OPTION 2 - TRUSS

This option is a variation of the previous one, using a variable-depth through-truss layout. This is also a very frequently used type in railway environments. The main difference with Option 1 is, from an architectural standpoint, the increased transparency allowed by the scheme. In this case the parapet role should be performed by elements that are independent of the main structural ones.

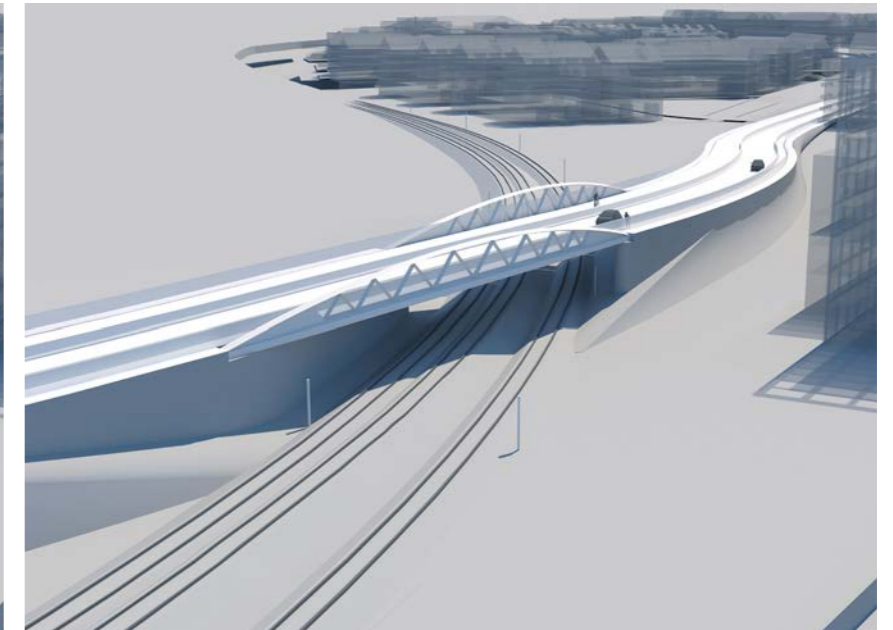
OPTION 3 - LATTICE

This third option has structure above and below deck to shorten the span and to overlap structure and parapets with a depth that is close to the 1.8m required for the latter when crossing a railway. The design is comprised of two main structural steel elements at the edges of the deck, and a series of other intermediate low-depth longitudinal elements that complement the overall layout. The main structural side elements are two lattice trusses, with a dense mesh closer to the bearing elements due to the

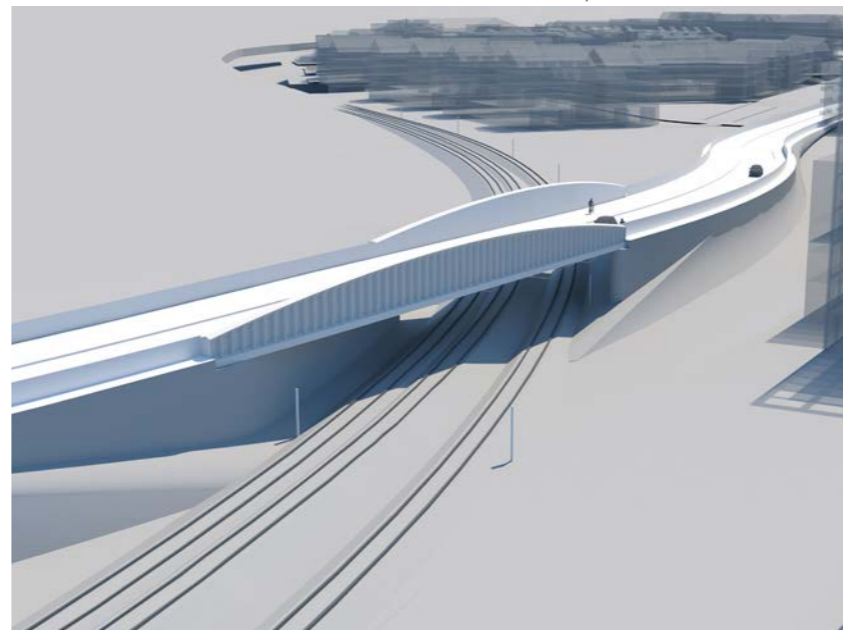
increased shear forces. These trusses are supported by triangular cells at the ends of the bridge. From a road user perspective, this solution doesn't provide such a clear gateway effect as the two previous ones.



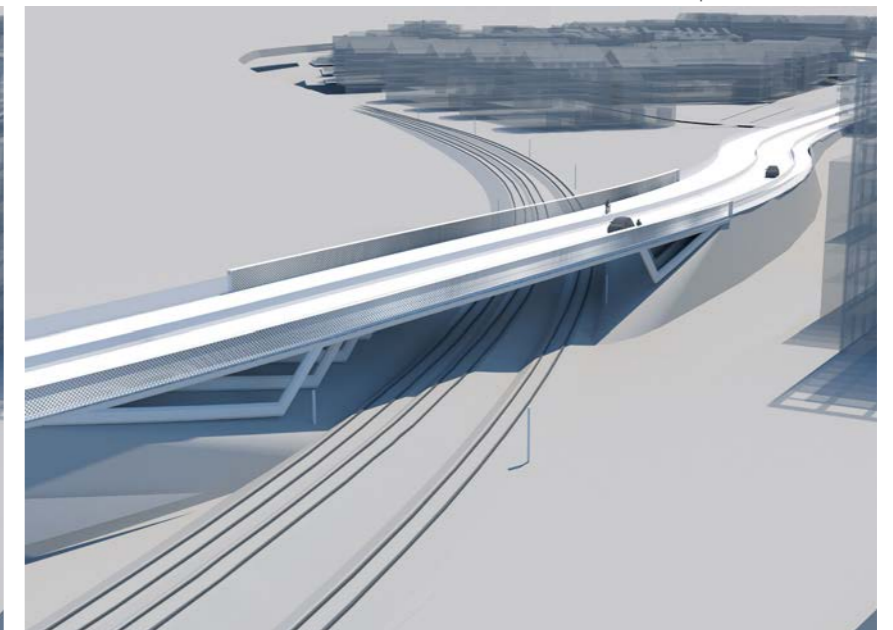
Option 0 - I Basic beam



Option 2 - Truss



Option 1 - Through



Option 3 - Lattice

6.1 East Coast Main Line Bridge

6.1.3 PREFERRED OPTION

OPTION 4 - VARIABLE DEPTH BEAM / INTERMEDIATE ARCH

This option was selected as the preferred option.

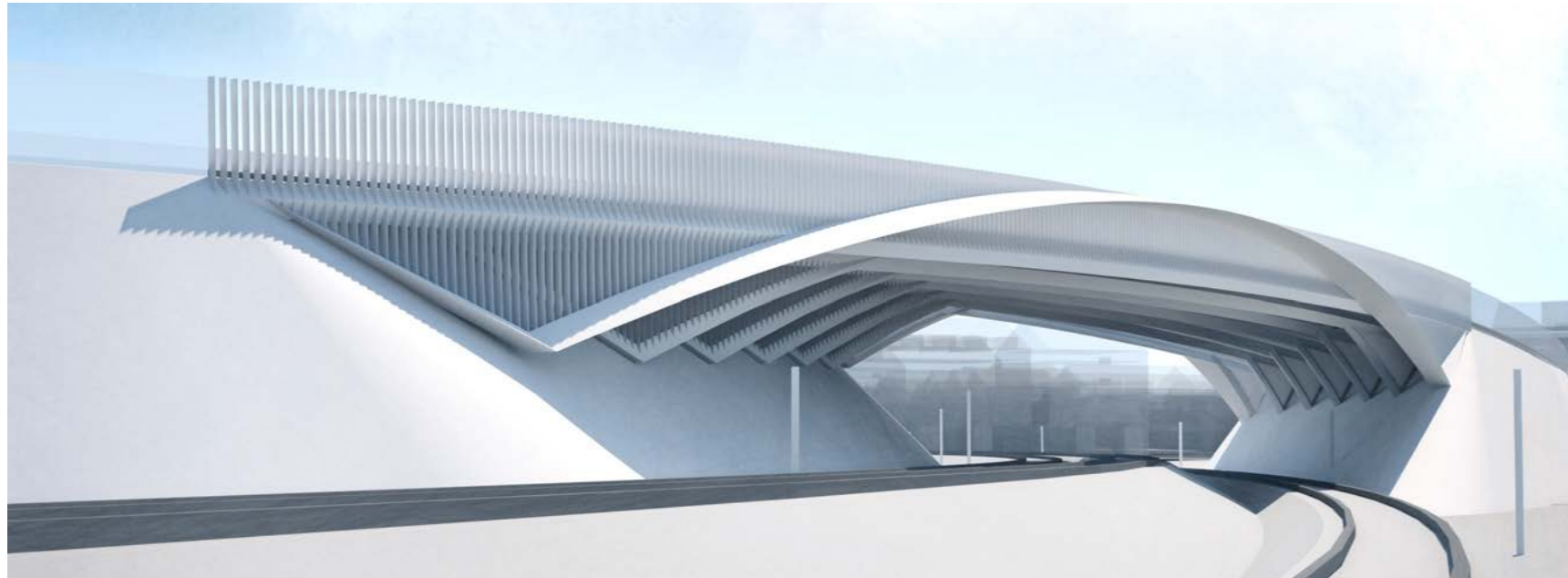
It also has structure above and below deck. It is an evolution of Option 4, adding features of the second solution thanks to the curved main structure. The design is made up by two main structural elements at the edges of the deck, and a series of other intermediate low-depth longitudinal ones. These are connected to a top concrete slab to create a composite deck.

The main structural side elements are a hybrid between variable-depth Vierendeel beams and half-through arches.

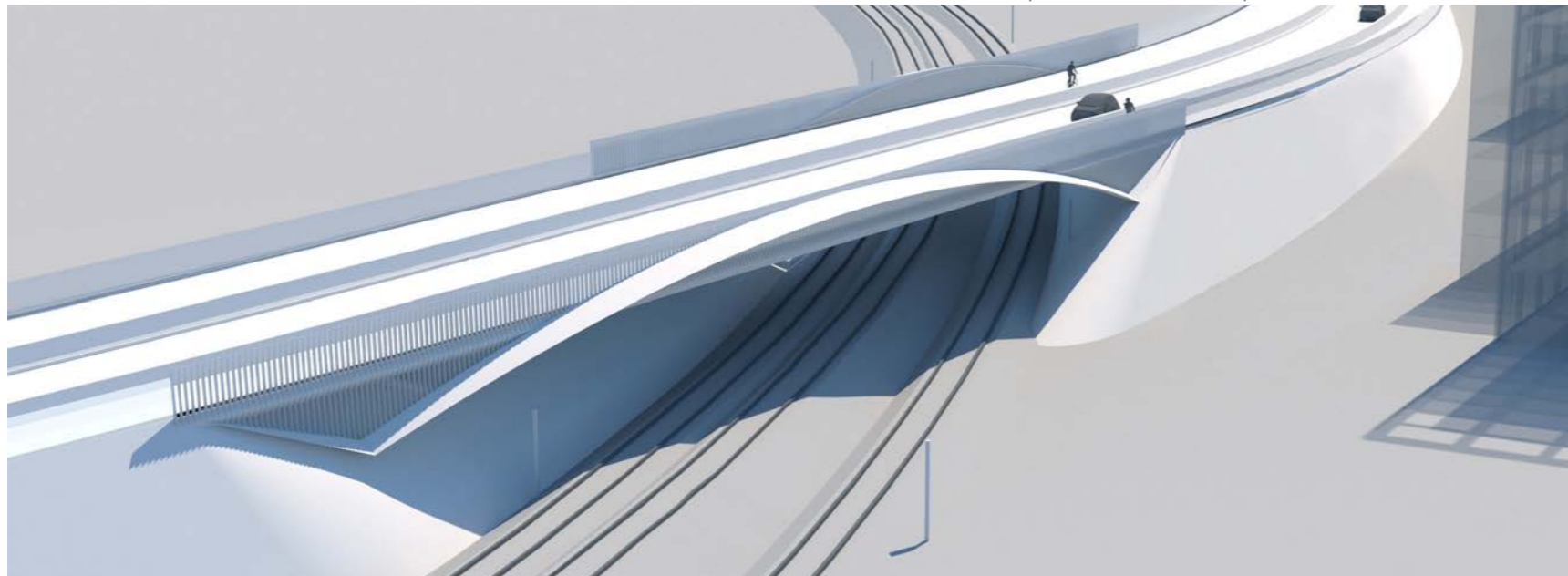
The intermediate structural elements are small box girders, also supported by V-shaped cells that mimic the form of the triangular cells of the main edge beams.

The arrangement of the structural elements below the deck will enhance a large and dark space by creating interest and rhythm.

This option defines a more legible gateway, both for railway and deck users, than the previous ones thanks to the side arches, highlighting the start of the new development.



Preferred Option - Variable Depth Beam / Intermediate Arch



Preferred Option - Variable Depth Beam / Intermediate Arch

6.1 East Coast Main Line Bridge

6.1.4 FORM

DESIGN

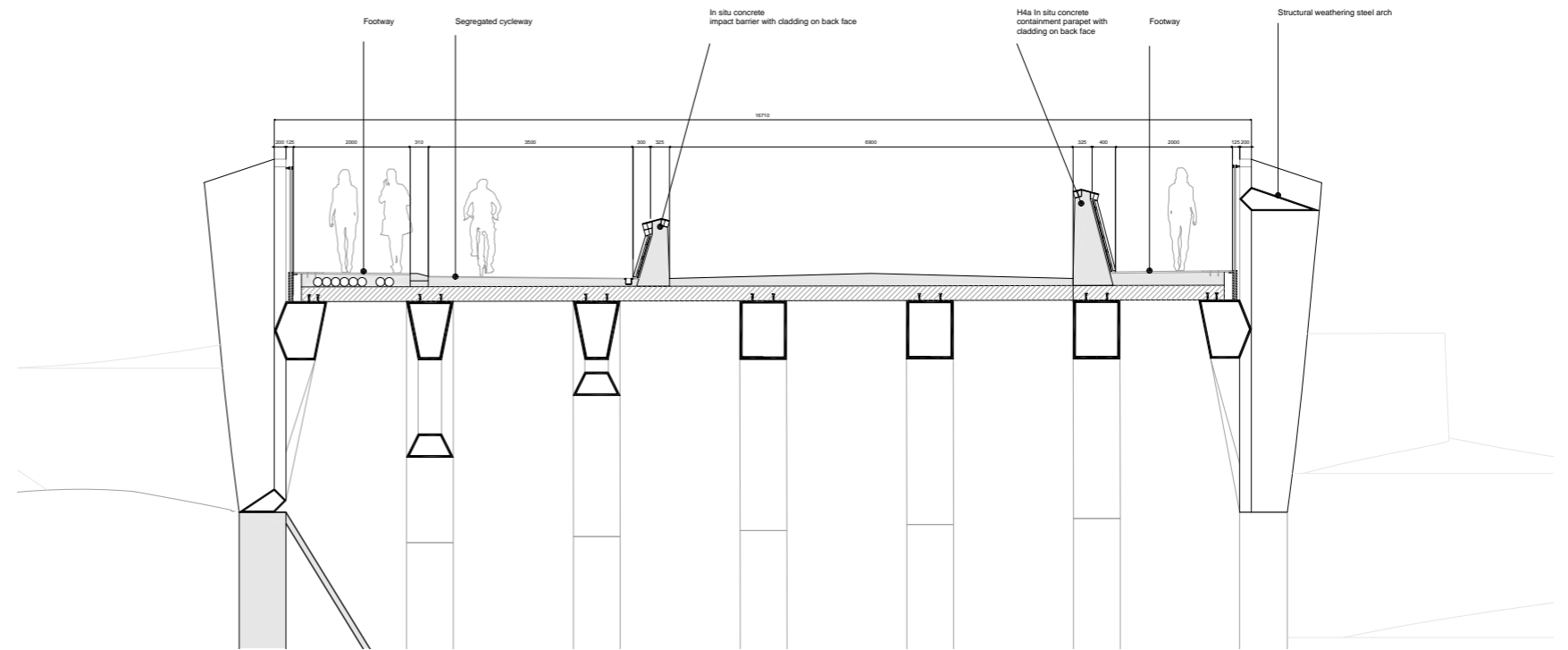
The East Coast Main Line Bridge has a main span of 71m and a width of 17m, hosting a two-lane road, segregated paths for pedestrians and cyclists on the eastern pavement and a dedicated pedestrian route on the western one.

Its layout combines half through arches and rigid frames. All these elements are connected to a top concrete slab, creating a composite weathering steel-concrete structure. The pedestrian and vehicular protection required over railway lines are disengaged, using concrete impact barriers between road and pavements and glass parapets at the deck edges, to maximize transparency and allow visibility from the bridge. This will allow for the bridge to be a platform to admire not only York Central and York Minster, but also for train enthusiasts to enjoy the railway environment.

The structure is divided into smaller longitudinal elements, creating a rhythmic sequence of V-shaped cells thanks to the skew in plan between road and railway, but also allowing the installation of the bridge over the East Coast mainline with cranes over a series of possessions during Rules of the Route overnight.

The main structural side elements are a hybrid between variable-depth Vierendeel beams and half-through arches. Arch and deck (or top and bottom chords) are connected at their ends. Architecturally, this connection creates triangular cells that enable the design to respond to the surrounding landscape by adapting the geometry of these back spans to the slope of the embankment below the bridge, which smoothly continues below the structure.

Arch and deck are linked continuously in the central area by a series of vertical plate elements acting as hangers. This geometry appears opaquer when seen in skewed views and more transparent in orthogonal ones. Thanks to this, pedestrians uncomfortable crossing over a railway will be offered a protective edge, while those interested in observing the trains and the railway infrastructure will have an opportunity to do so (by stopping and looking for a framed view in between plates).



ECML cross section



ECML Bridge aerial view from West of East

6.1 East Coast Main Line Bridge

6.1.4 FORM

This parapet system also offers the opportunity to create a beautiful and smooth transition from the bridge to the landscape, by changing some design parameters of the parapet when approaching to the abutments. These parameters are: material (from weathering steel to painted steel or timber), spacing between vertical elements, and height of vertical elements.

The ECML bridge will set the tone for York Central for many people accessing the new development, both chronologically (one of the first elements to be built) and physically (main access point to York Central for many). For this reason, the bridge has been designed to be a statement structure that acts as a gateway to the new development.

The crossing has been conceived as an elegant bridge to be proud of, which is not out of place in a city of outstanding architectural relevance and beauty, and

is a fitting addition to the expected high-quality future neighbourhood, but not necessarily an iconic design or a landmark. The bridge is respectful with the main elements of the townscape: the York Minster, the existing neighbourhoods north of the bridge, and the railway line being crossed (one of the most important ones in the UK). The bridge will respect the existing views of the Minster from different viewpoints in the area and will allow new views from its deck. It will also provide a pleasant background for views from the existing nearby neighbourhoods.

The bridge has been designed to respond to the site particularities as the connection in between two green areas (Millennium Green and Great Park), or appropriate relationship in scale with the nearby buildings (e.g. houses around Garnett and Garfield Terrace and flats in York Yard South in York Central). The ECML bridge seems to, thanks to its side slender arches, subtly and respectfully jump

over the railway tracks linking the two green areas while adapts its shapes to the different constraints envelopes to achieve slenderness and optimise its scale to avoid a landmark competition with the buildings in the proximities.

The bridge has been designed to meet all the constraints of a crossing over the railway (high deck to meet headroom requirements, high solid parapets or, in this case, very skewed crossing). The design not only acknowledges these constraints but makes them important design features. For example, the skew, very intrinsic to the nature of many railway crossings, is not ignored in the design but, on the contrary, celebrated by making it a main feature in the aesthetics. Having divided the steelwork into a rhythmic sequence of V-shaped cells adds interest and rhythm to the large space below deck and is a reference to some of the most historically valuable bridges in York, as Lendal and Skeldergate Bridges, with similar structural arrangements (without skew). This fact, together with the structural and geometric layout of the bridge as a hybrid between arch, rigid frame and beam will make the bridge become a natural addition to the family of York bridges, all of them within this group of structural types.

The new bridge will be part of the main street of York Central, which is expected to be a high-quality urban environment. The bridge pavements have been conceived for the experience crossing the bridge not to be worse than the experience walking out of the bridge.



ECML Bridge elevation view from Millennium Green near Garnet Terrace

6.1 East Coast Main Line Bridge

6.1.5 MATERIALS AND FINISHES

MATERIALS AND FINISHES

The location of the bridge over the railway will make inspection and maintenance of the new ECML bridge more difficult than if the bridge was crossing other types of obstacles.

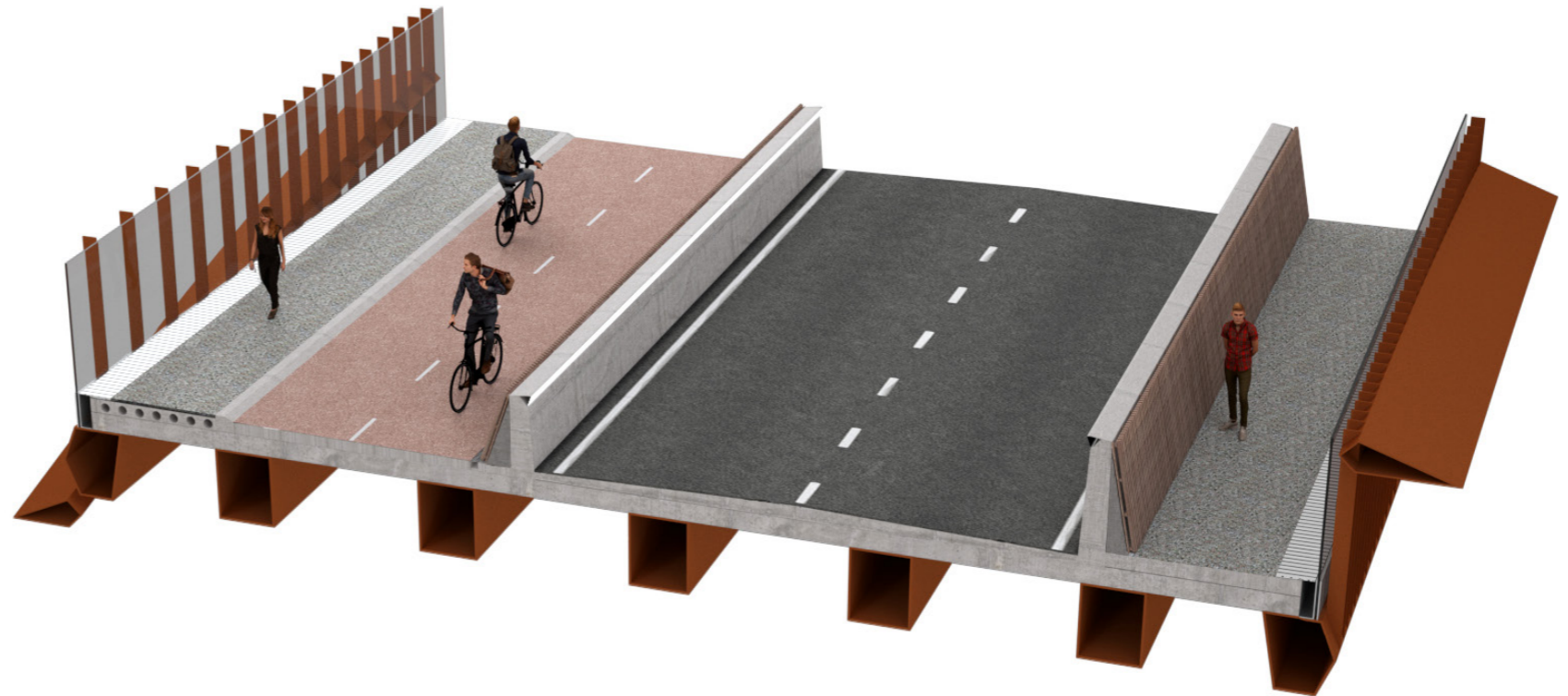
The bridge has been designed to be an appropriate solution from a maintenance point of view, minimising maintenance of the surfaces that would need to be accessed from the railway environment having been one of the design aims. The choice of material that, due to its self-protective patina, requires less maintenance than others, the reduction of exposed surface of steel by using a composite cross section, or the limited number of steel elements part of the soffit over the tracks, were some design measures to meet this design aspiration.

Weathering steel will be used for the arches, beams and parapet which will provide an architecturally pleasant durable bridge with limited maintenance.

Safety glass, cantilevering out from the deck, will be used to meet the requirements of a solid unperforated parapet prescribed by Network Rail whilst maintaining a transparent lightweight appearance. Glass fixings will be made of stainless steel to avoid staining of the glass by these elements.

Pavement surfacing will provide continuity over the bridge of the materials used in the rest of Park Street. Impact barriers at both sides of the bridge will be made of concrete with either a timber cladding or a textured surface on the areas facing the pavements with the aim of providing a high-quality environment for pedestrians and cyclists.

The abutments will be made of concrete with a natural stone cladding that will provide continuity to the surface treatment of the terraces of the access embankment all along the underside of the bridge.



6.1 East Coast Main Line Bridge

6.1.6 LIGHTING

LIGHTING

Lighting for both road and pavements will be delivered by a continuous linear luminaire system mounted on the top of the concrete vehicle restraint systems.

The linear lighting sources will be located within stainless steel housings that define a clean and legible geometry in conjunction with the impact barriers and the cladding of their surfaces facing the pavements.

The design of these housings will protect drivers from direct views of the light source in the case of the road luminaries and, together with the sequence of steel plates that are part of the edge glass parapets, will make it possible to avoid light spills to the railway environment or adjacent ecological areas, in the case of the pavement luminaries.

More information on the ECML Bridge lighting system can be found at section 7 of this document.

6.2 Severus Pedestrian and Cycle Bridge and Severus Road Bridge

6.2.1 DESIGN APPROACH

THE NEED FOR A NEW PEDESTRIAN AND CYCLE BRIDGE

The existing Severus Road Bridge spans several branches of rail, including the East Coast Mainline, and associated Network Rail land. It is a concrete structure with an intermediate pier in the railway environment and concrete parapets on its edges. The creation of the York Central new development will require an increase in the capacity of the bridge for vehicle, pedestrian and cyclist use and an upgrade of its parapets to meet the current technical standards. This larger capacity cannot be achieved within the current bridge deck. To create the additional capacity for a right turn lane and a 3m shared cycle and footway, a parallel pedestrian and cycle bridge will be constructed. It will have a shared 4m-wide platform, nearby the south edge of the existing structure.

Although the structure should reflect the quality aspirations of the York City masterplan, it is not the gateway into the development as the neighbouring East Coast Main Line Bridge is. For this reason, the design should be elegant but understated. Having a clear hierarchy between the two bridges is a fundamental aspect of its design.

Additionally, the south elevation of the bridge will be highly visible to vehicles, pedestrians and cyclists travelling north away from the new development. Also, from Millennium Green, Poppleton Road Primary School, Seldon Road and the Water End Road itself. The new crossing offers an opportunity to create a visible façade with higher architectural standards towards York Central, but aiming for a scale and design that are modest and sympathetic to the suburban backdrop, not becoming a too prominent element of the townscape.



Existing Severus bridge deck view



Existing view towards York Minster from Severus bridge



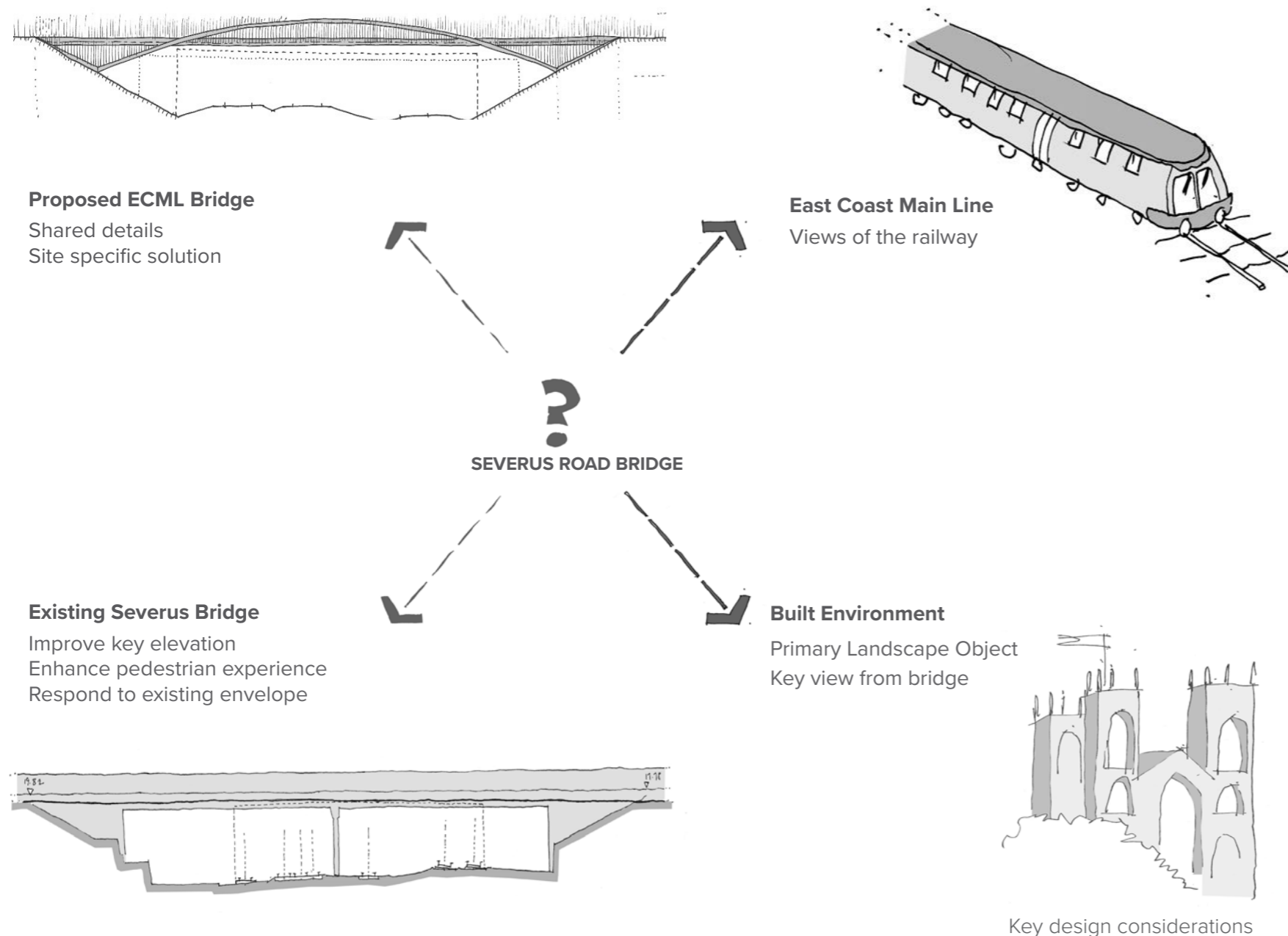
Existing South Elevation of Severys bridge



Existing Severus bridge deck view

6.2 Severus Pedestrian and Cycle Bridge and Severus Road Bridge

6.2.1 DESIGN APPROACH



RESPONDING TO SITE CHARACTERISTICS

Numerous constraints have informed the structural typology and the positioning of the new bridge:

- A key requirement set out by Network Rail was to not limit the future railway clearance. The existing bridge does not comply with current standards regarding this aspect; however, the new pedestrian and cycle bridge will do. Combining this requirement with an aspiration to tie into existing pathway levels without ramps has led to a design that places most of its structure above deck.
- The York Minster is the primary landscape object for the city. The bridge should provide views towards the cathedral and offer a vantage point over the railway below. The current Severus Road Bridge is a key observation area of the railway environment for train enthusiasts. The current 1.5m parapet will need to be increased up to 1.8m to meet current NR requirements meaning there is a risk that the new parapet will obstruct views onto the tracks.
- Although the structure should reflect the quality aspirations of the York Central masterplan, it is not the gateway into the development as the neighbouring East Coast Main Line bridge is. For this reason, the design should be simple but elegant in appearance and scale, a fitting addition to the existing context.

6.2 Severus Pedestrian and Cycle Bridge and Severus Road Bridge

6.2.1 DESIGN APPROACH

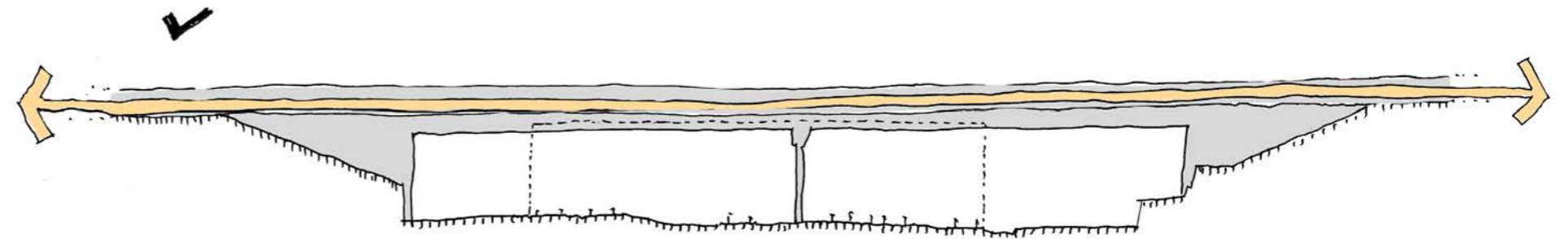
VERTICAL ALIGNMENT

Aiming to meet the aspiration of not to limit the potential future railway clearance requirements below deck, two alignments were considered. The first one followed the existing alignment of the Severus Road Bridge with structure above deck (Option 01), while the second one introduced a vertical profile with some structure below deck (Option 02).

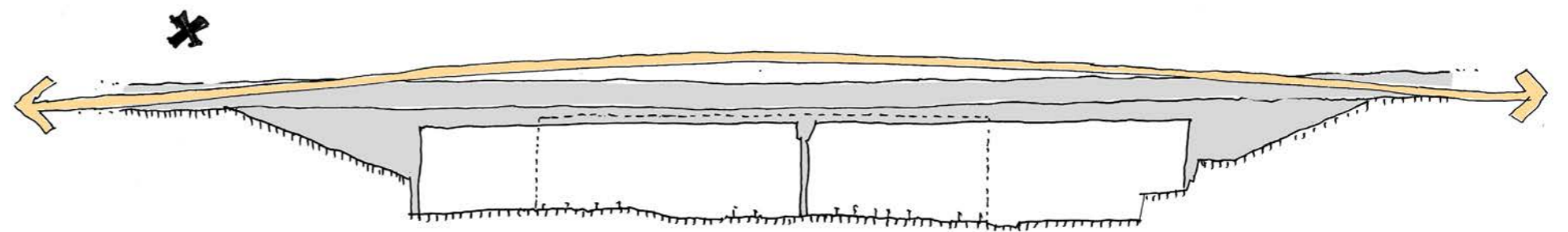
Option 01 (structure above deck) matches the existing profile of the road and path, providing a comfortable transition for pedestrians whilst following the existing geometry of the bridge.

Option 02 (structure partially below deck) increases the gradient and therefore makes the transition less comfortable. The profile does not match the existing and therefore requires the bridge to be moved away from the bridge to avoid a clash in geometry. This could be achieved through a plan curve which would involve more complex geometry, increasing the project cost.

Option 01 was pursued as it has more benefits in terms of improving user experience and aesthetics, both key aspirations for the design.



Option 01: Alignment with structure above deck

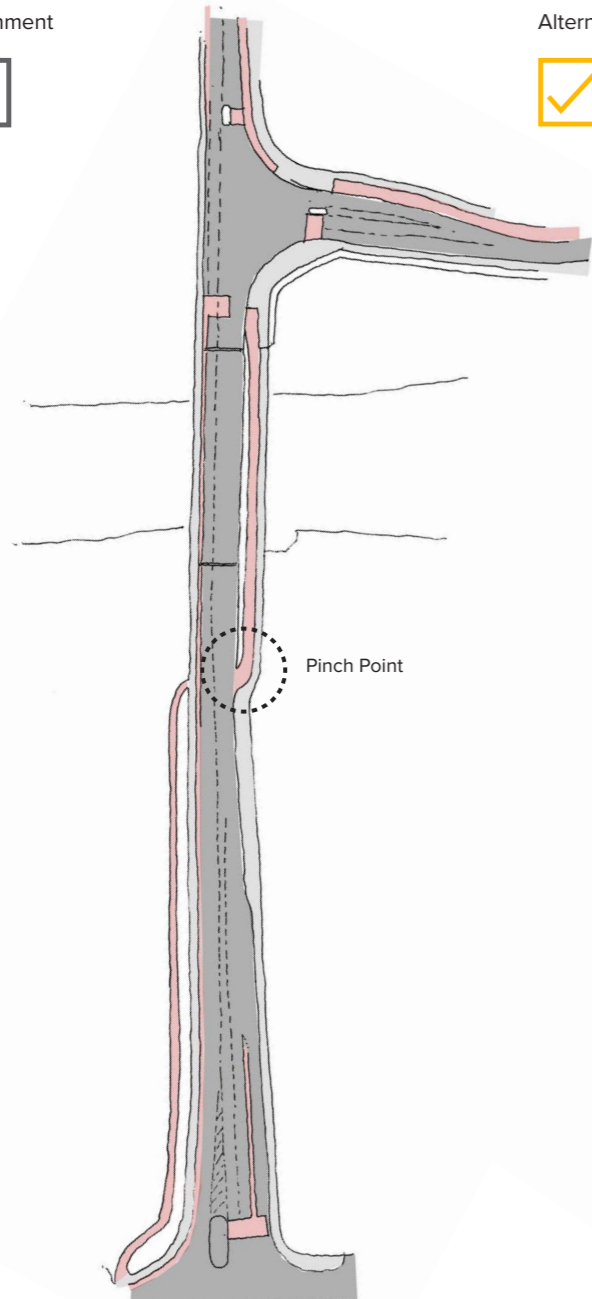


Option 02: Alignment with structure below deck

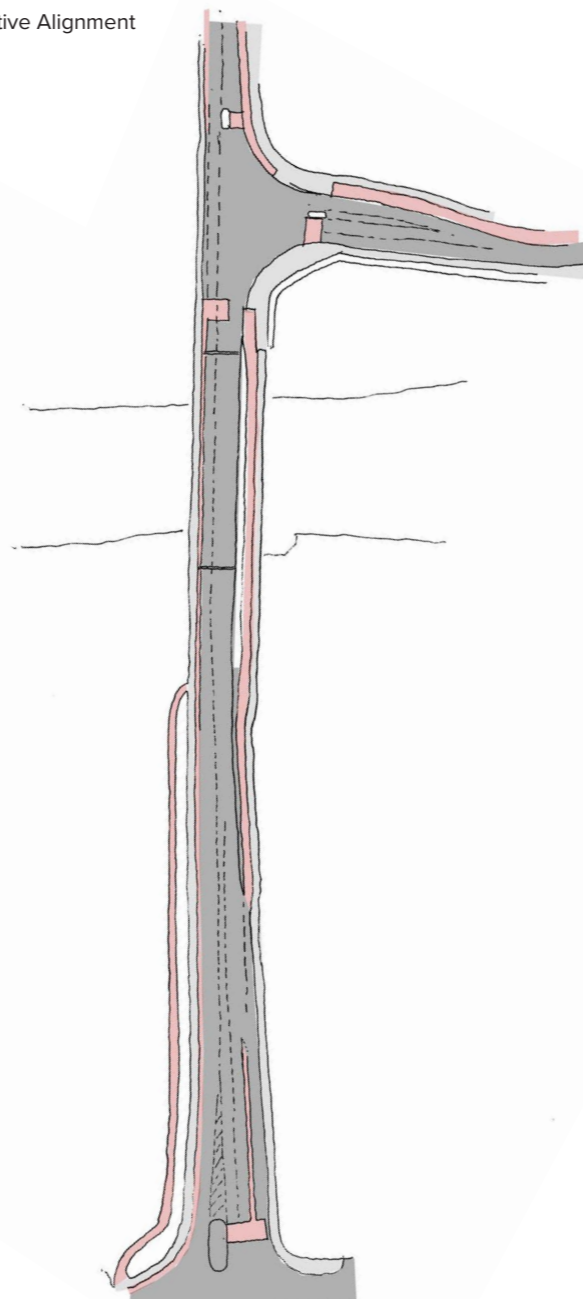
6.2 Severus Pedestrian and Cycle Bridge and Severus Road Bridge

6.2.1 DESIGN APPROACH

SAlignment



Alternative Alignment



Pinch Point

HORIZONTAL ALIGNMENT

The aim for the horizontal alignment was to create a seamless transition that would keep both pedestrians and cyclists safe, avoiding clashes with traffic and each other.

The analysis for defining the horizontal alignment started with the shortest possible one (left figure). This arrangement would create a pinch point between cyclists and motorists where the cycle path joins the road. The functional width would be narrow at this crucial point and the distance from the junction where cyclists turning right need to manoeuvre into the road, considerable.

The preferred alignment, in order to solve these drawbacks, ties into the existing condition by extending the width of the combined pedestrian/ cycle way from the bridge through to the wider section of road. Although this requires widening the pavement for a longer section, it makes the overall transition smoother and safer. It takes cyclists closer to the junction, offering better sight lines, allowing them to see the layout of the junction before joining the road.

Alignment options

6.2 Severus Pedestrian and Cycle Bridge and Severus Road Bridge

6.2.2 OPTIONS CONSIDERED

Several options were considered for the design of the new Severus Pedestrian and Cycle Bridge. The proposals are presented below.

OPTION 1 - SINGLE SPAN TRUSS

This is a simple truss with a main span of the full length of the Severus Road Bridge. The most visible and accessible elements of the weathering steel structure are painted. A full height glass parapet on the southern edge is proposed between the truss elements.

OPTION 2 - SINGLE SPAN WEATHERING STEEL TRUSS

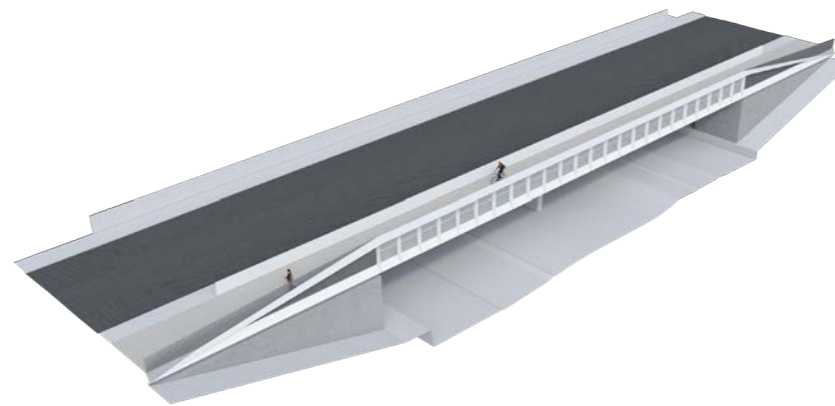
The main difference with Option 1 is that the weathering steel is left un-painted. The bridge would be a more prominent element of the cityscape, visually dominating the area and competing with the ECML Bridge.

OPTION 3 - 2-SPAN CONTINUOUS WEATHERING STEEL BEAM

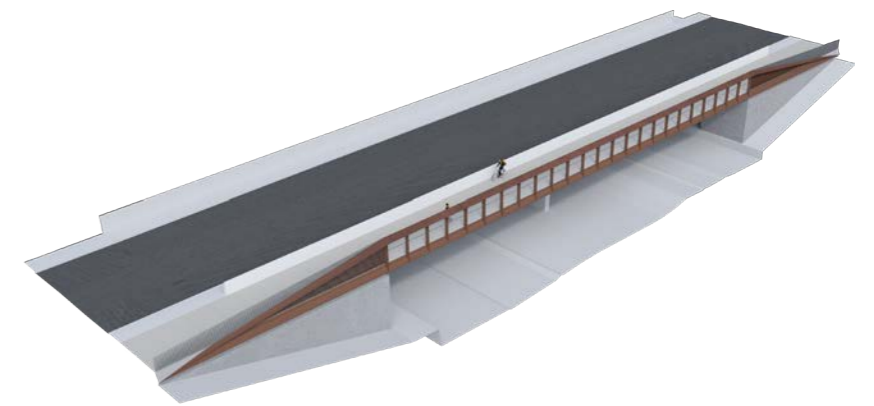
This option is supported by a central concrete pier. The slenderness that can be achieved in the visible edge of the bridge thanks to the shortening of the main span would allow the use of weathering steel without competing with the ECML bridge. The glass parapet would be kept on the southern edge and would be held by stainless steel parapet posts bolted to the main steelwork (with an appropriate detail to prevent galvanic corrosion). The central pier would be aligned with the pier of the existing bridge.

OPTION 4 - 3-SPAN CONTINUOUS WEATHERING STEEL BEAM

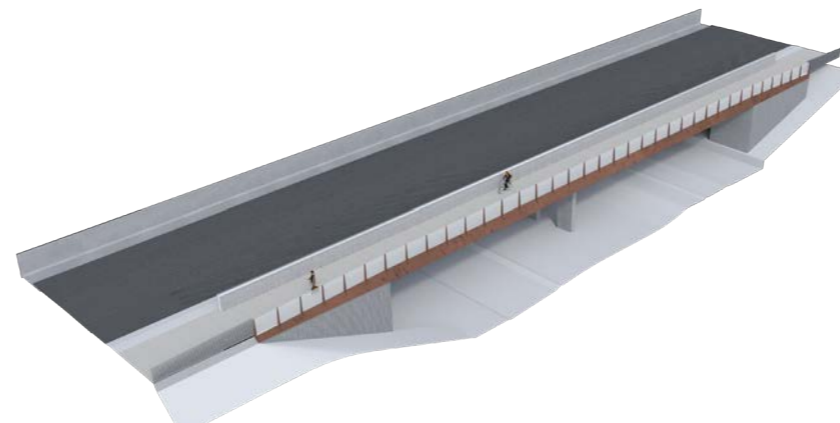
This fourth option is supported by two piers 4.5m outside the tracks area. The slenderness that can be achieved in the visible edge of the bridge thanks to the shortening of the main span would allow the use of weathering steel without competing with the ECML bridge. Two slender weathering steel columns would support the footbridge on either side of the railway, and the abutments of the footbridge would be much smaller than those of the existing Severus Road bridge. The glass parapet is similar to the one proposed for Option 3.



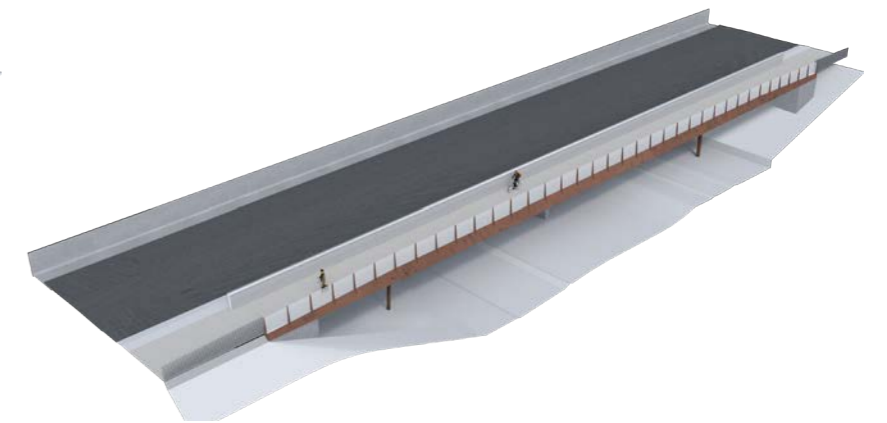
Option 1 - Single span truss



Option 2 - Single span weathering steel truss



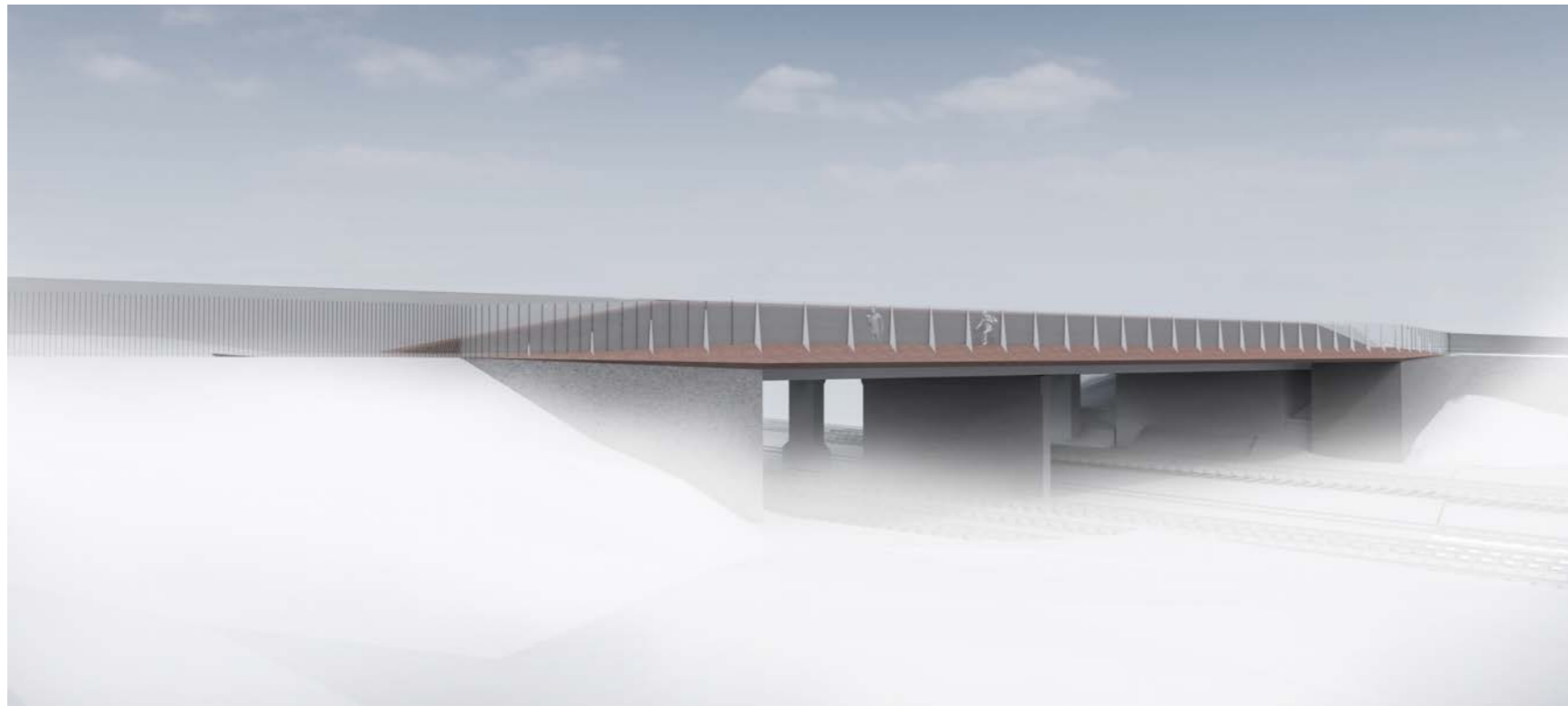
Option 3 - 2-span weathering steel



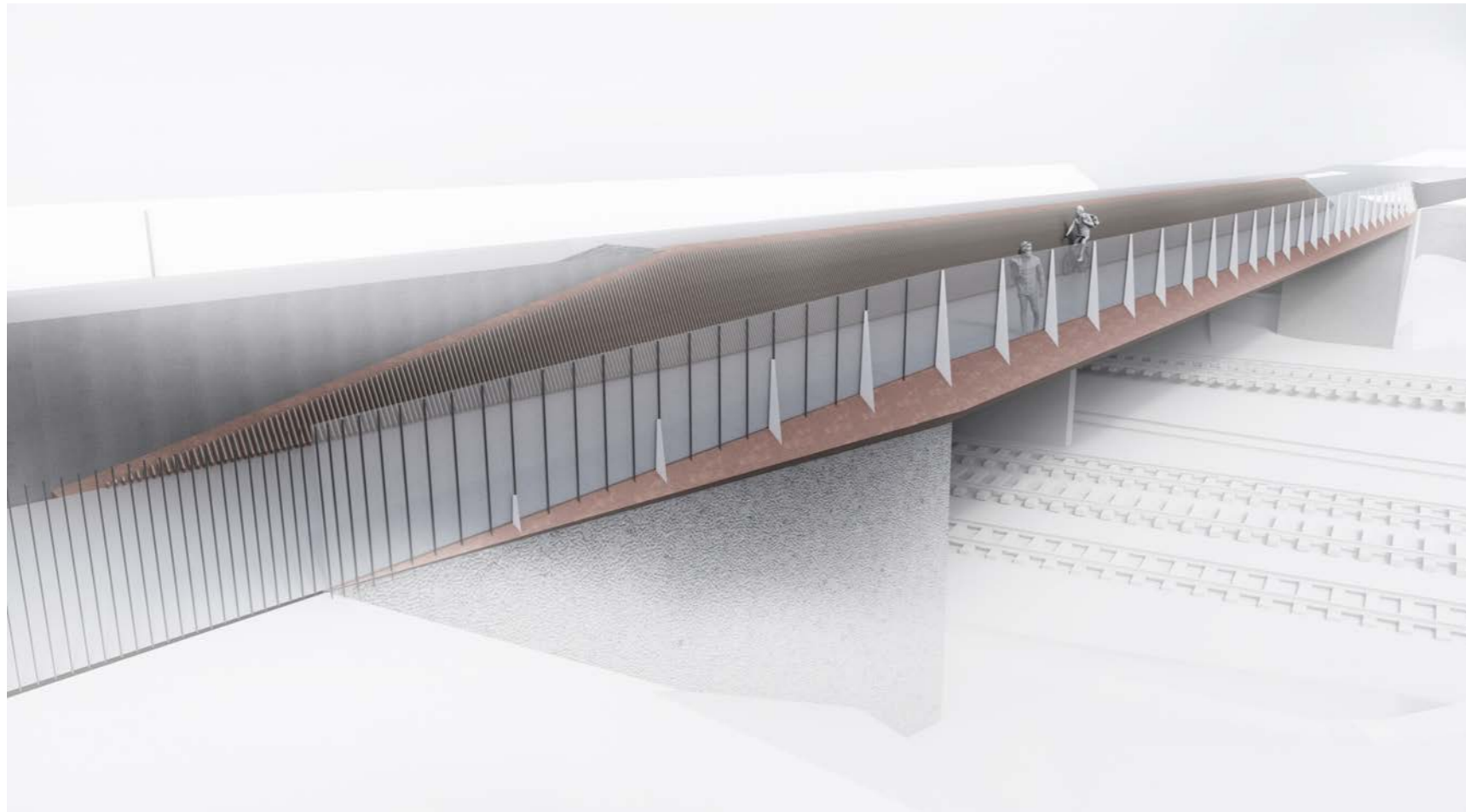
Option 4 - 3-span weathering steel

Severus Pedestrian and Cycle Bridge and Severus Road Bridge

6.2.3 PREFERRED OPTION



Preferred option - Single span asymmetric weathering steel beam without intermediate supports



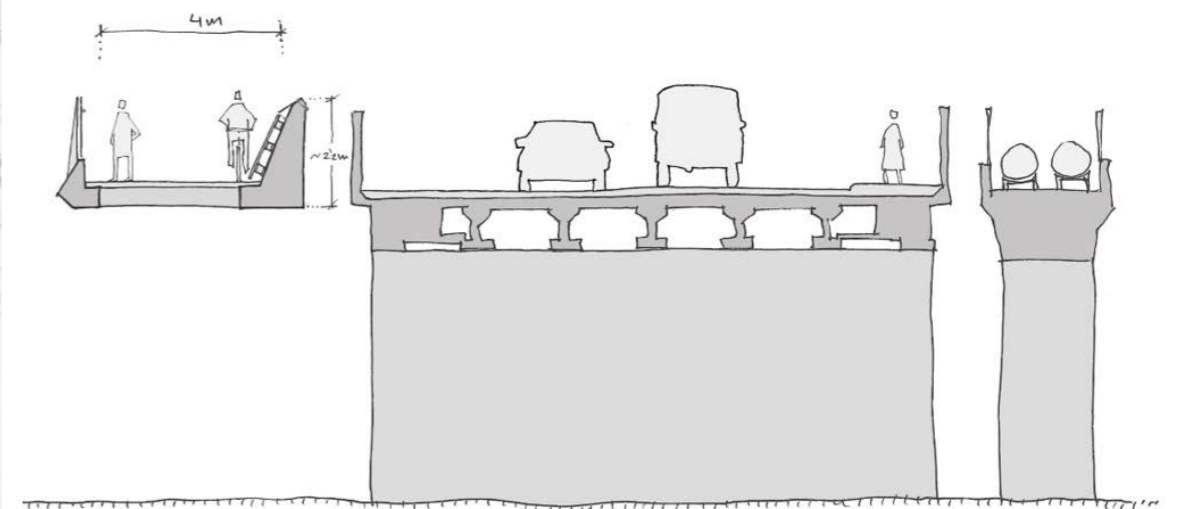
Preferred option - Single span asymmetric weathering steel beam without intermediate supports

PREFERRED OPTION

In order to minimise disruption to the rail network below during construction and the number of elements to be inspected and maintained from the railway environment, it was decided to avoid intermediate piers.

The preferred agreed option is a weathering steel structure, with three-span beam structural layout in which the two side spans are hidden within the abutments, allowing to cross over the railway environment without any intermediate supports.

In order to reduce the visible weathering steel edge of this 52m long bridge, the bridge has an asymmetric cross section arrangement. The main beam is adjacent to the nearby concrete impact barrier of the existing Severus Road Bridge. This 1.8m high element allow the opposite edge to be slender and transparent, giving the opportunity to the users to admire the York Minster, the railway and the new development.



6.2 Severus Pedestrian and Cycle Bridge and Severus Road Bridge

6.2.4 FORM

DESIGN

The Severus Pedestrian and Cycle Bridge is a weathering steel structure designed without any intermediate supports. It has a main span of 52m and a functional width of 4m, hosting an unsegregated pedestrian and cyclist route. It has an asymmetric transverse layout, with its main structural element facing the nearby concrete impact barrier of the existing bridge, allows the opposite edge to be slender and transparent, giving the opportunity to the users to admire the York Minster, the railway environment and the new development. By doing that, the design of the new footbridge acknowledges the close proximity of the Severus Road Bridge, responding to it, while it celebrates the importance of the railway in York by permitting views.

Although the new pedestrian and cycle bridge is located two metres away from the road bridge, the new structure is fundamentally a widening of the existing bridge to increase its capacity. Although the structure should reflect the quality aspirations of the York City masterplan, it is not the gateway into the development as the neighbouring ECML Bridge is. Its design responds to this hierarchy between the two structures, without renouncing to the elegance required for its role as a new façade for the group of bridges standards towards York Central, with architectural standards that are commensurate with those expected for the new development.

Simple concrete abutments match the proportions of the existing Severus bridge creating a clean, uncluttered appearance.

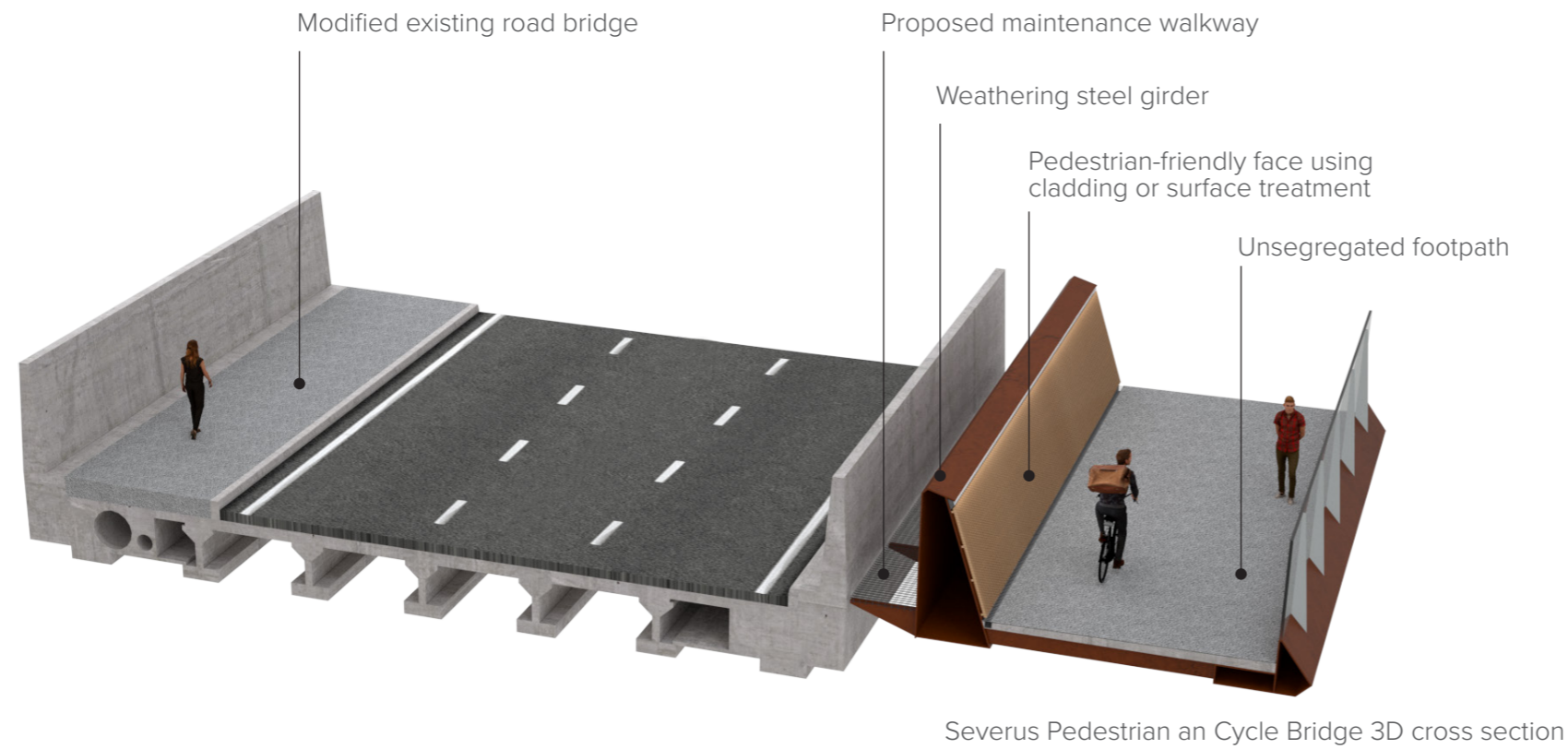
The new bridge will be part of a high-quality urban environment. The experience crossing the footbridge should be commensurate with the quality of the future neighbourhood it will be providing access to, and it will be reflected in the shapes of the deck and the materials and details used.



Visualisation of the Severus Pedestrian and Cycle Bridge of the Severus footbridge

6.2 Severus Pedestrian and Cycle Bridge and Severus Road Bridge

6.2.4 FORM



The bridge meets all the constraints of a crossing over the railway (vertical headroom and high solid parapets, being the main ones in this case) and the design does not clash as a member of the family of York bridges.

The bridge was designed to make its construction is compatible with installation over a series of possessions during Rules of the Route overnight.

SEVERUS ROAD BRIDGE MODIFICATIONS

The existing road bridge deck will be widened to provide a widened deck to accommodate a 3.0m shared cycle and footway on the northern side of the deck, to provide increased vehicle lane widths and to accommodate a new right-turn lane into York Central for eastbound vehicles.

The existing bridge parapets, which are do not meet the current Network Rail safety guidelines will be demolished and reconstructed to provide a 1.8m parapet.

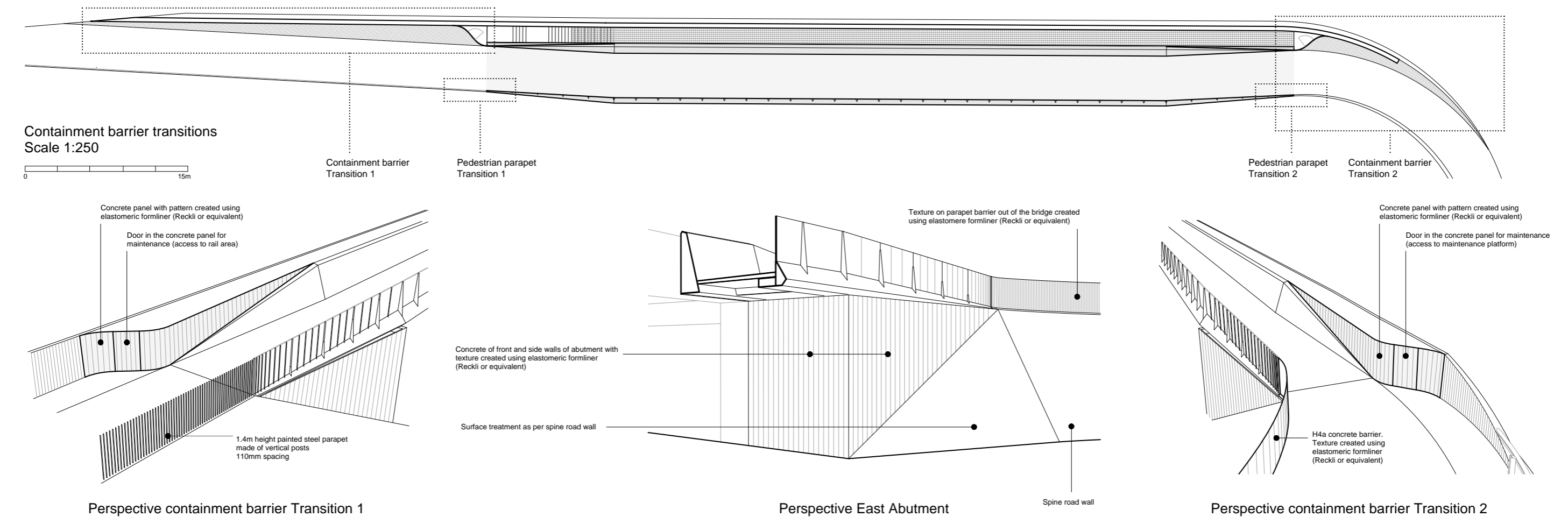
6.2 Severus Pedestrian and Cycle Bridge and Severus Road Bridge

6.2.4 FORM

TRANSITIONS OUT OF THE PEDESTRIAN AND CYCLE BRIDGE

The four end corners of the bridge were designed to have a smooth transition to the different parapets or vehicle restraint systems out of the bridge. At the northern ends, the transition from the timber cladding covering the inner face of the main girder to the back face of the H4a concrete barrier at the edge of the Severus Road Bridge will be materialised with concrete panels with a vertically ribbed pattern. This pattern will have continuity out of the new bridge on the back face of the new concrete barrier of the existing bridge.

The smooth transition at the southern ends of the new bridge are achieved thanks to vertical steel elements welded to the external web of the secondary girder when on over the abutments. These elements, in combination with the main posts supporting the glass panes, vary in distance between them, from the typical pane module (2m) to 110mm, which is the distance between the vertical elements that are part of the pedestrian railing out of the bridge towards the west, or the distance between grooves in the ribbed pattern of the concrete vehicle restraint system towards the east.



Transitions out of the Severus Pedestrian and Cycle Bridge

6.2 Severus Pedestrian and Cycle Bridge and Severus Road Bridge

6.2.5 MATERIALS AND FINISHES

MATERIALS AND FINISHES

The location of the bridge over the railway will make inspection and maintenance of the new Severus Pedestrian and Cycle Bridge more difficult than if the bridge was crossing other types of obstacles. The use of weathering steel, a material that due to its self-protective patina requires less maintenance than others, and the lack of central supports (and bearings), will help to minimise inspection and maintenance works from the railway area during the service life of the bridge.

The main girder running adjacent to the impact protection system of the road bridge will hide the vehicle restraint system installed on the edge of the road bridge, setting the basis to create a pleasant environment that will allow for a positive user experience. This girder will have a web that is almost invisible for the public and another that will directly face the walking/cycling area. This second 1.8m-high web will be covered by a pedestrian-friendly cladding or surface treatment that will both create the aimed attractive pedestrian and cycle environment and will avoid people getting stained by the material.

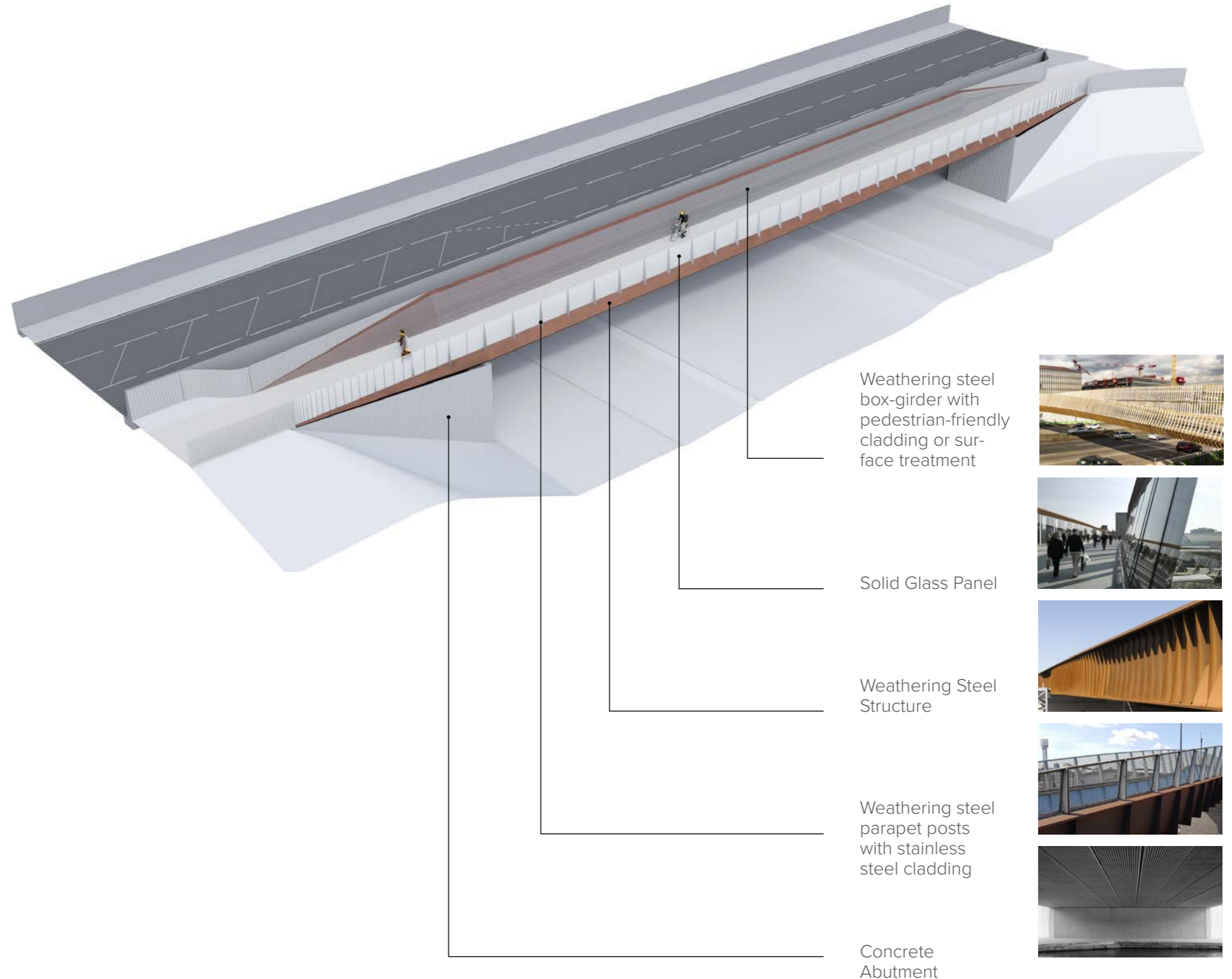
Safety glass will be used on the southern edge to meet the requirements of a solid unperforated parapet prescribed by Network Rail whilst maintaining a transparent lightweight appearance. Glass will be fixed to vertical posts with a stainless steel finish and insulation in between weathering and stainless steel to avoid galvanic corrosion.

The surfacing will be a resin bound gravel or coloured asphalt system that will guarantee slip resistance with a lightweight solution.

Concrete will be used for the abutments as a robust, durable solution that will match the abutments of the road bridge. A ribbed pattern on their visible faces will be less inviting for graffiti than a smooth surface and helps break the visual mass of the concrete. Any future staining or weathering will be less apparent than on a non-textured surface.

The design of the transitions of the bridge parapets out of the bridge will involve a series of vertical steel elements welded to the bridge steelwork that vary their separation to eventually match the module of, on one of the four

end corners of the bridge, the vertical elements of a steel parapet out of the structure and, on the other three, the recesses in the ribbed pattern of textured concrete transition panels out of the bridge.



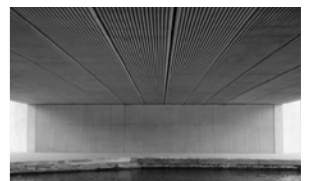
Weathering steel box-girder with pedestrian-friendly cladding or surface treatment

Solid Glass Panel

Weathering Steel Structure

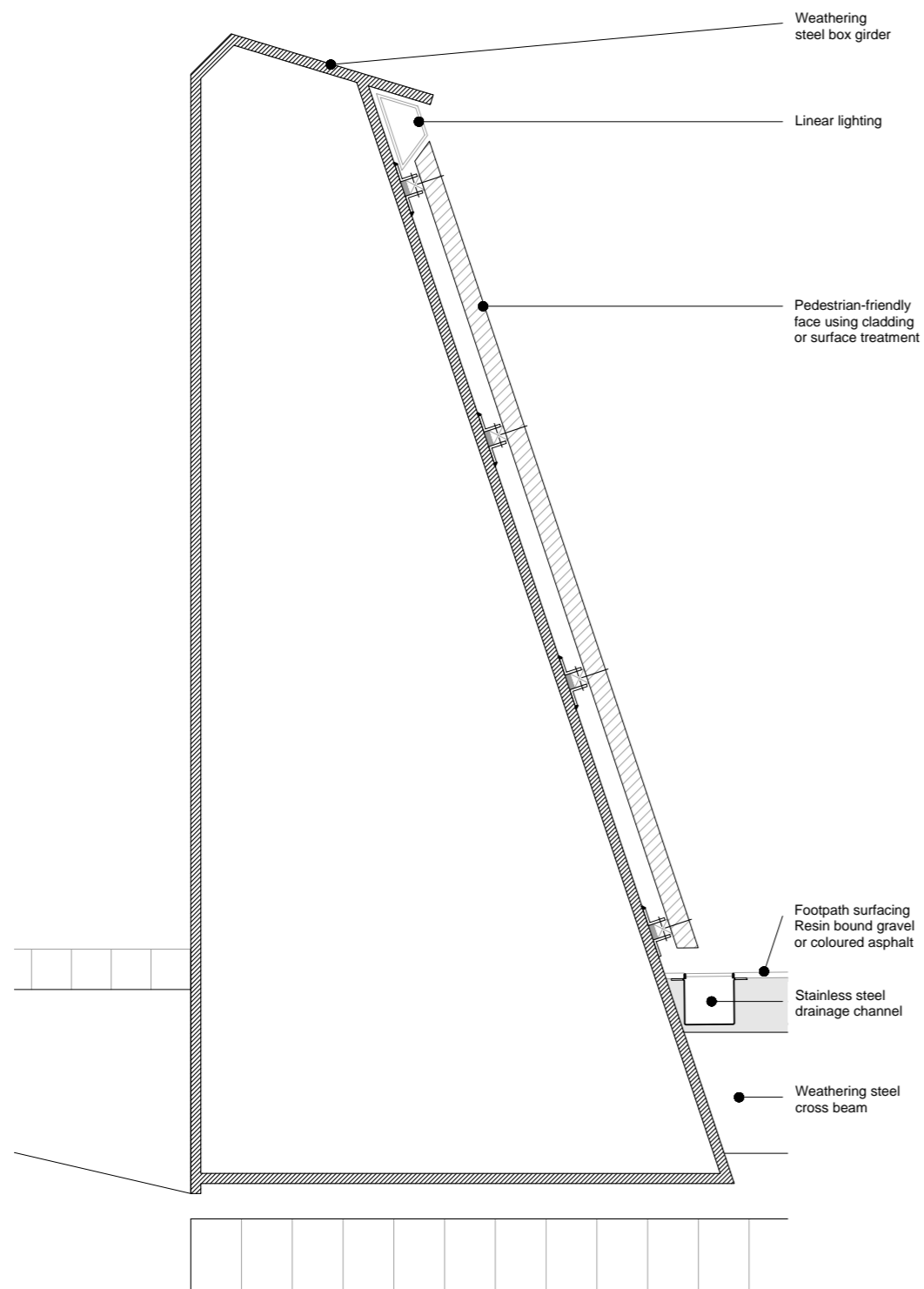
Weathering steel parapet posts with stainless steel cladding

Concrete Abutment



6.2 Severus Pedestrian and Cycle Bridge and Severus Road Bridge

6.2.6 LIGHTING



Typical cross section of the main girder of the Severus Pedestrian and Cycle Bridge, showing the lighting system at the top end
PHASE 1 INFRASTRUCTURE RMA - DESIGN REPORT | APRIL 2020

LIGHTING

The shared pedestrian and cycle space of the new bridge will be illuminated by a single continuous linear lighting element located at the top end of the internal web of the main girder, integrated as part of its timber cladding, and protected by an extension of the top flange of the girder.

The design of the lighting system, thanks to its position and angle, will make it possible to avoid light spills to the railway environment or adjacent ecological areas, while it enhances the shape of the bridge at night.

More information on the Severus Pedestrian and Cycle Bridge lighting system can be found at section 7 of this document.

7 LIGHTING STRATEGY

- 7 Introduction
- 7.1 Overview
- 7.2 Routes
- 7.3 Response to Ecology
- 7.4 Lighting Criteria
- 7.5 Lighting Equipment / Types
- 7.6 Colour Temperature
- 7.7 Bridges
 - 7.7.1 Bridges - East Coast Mainline
 - 7.7.2 Bridges - Severus Pedestrian and Cycle Bridge
- 7.8 Lighting Controls
- 7.9 Derogation from York Central Lighting Masterplan

7 Lighting Strategy

7 INTRODUCTION

York Central, a new development located in the heart of the York City next to York Railway Station, is a well-connected neighbourhood with new commercial quarters and residential communities.

A new highway will be built to connect different areas of York Central development, improve the linkage to the railway station and city centre from the wider York city area. The highway will also include a pedestrian pathway, cycle path, a bus lane and 2 bridges to improve sustainable travel modes to surrounding neighbourhoods.

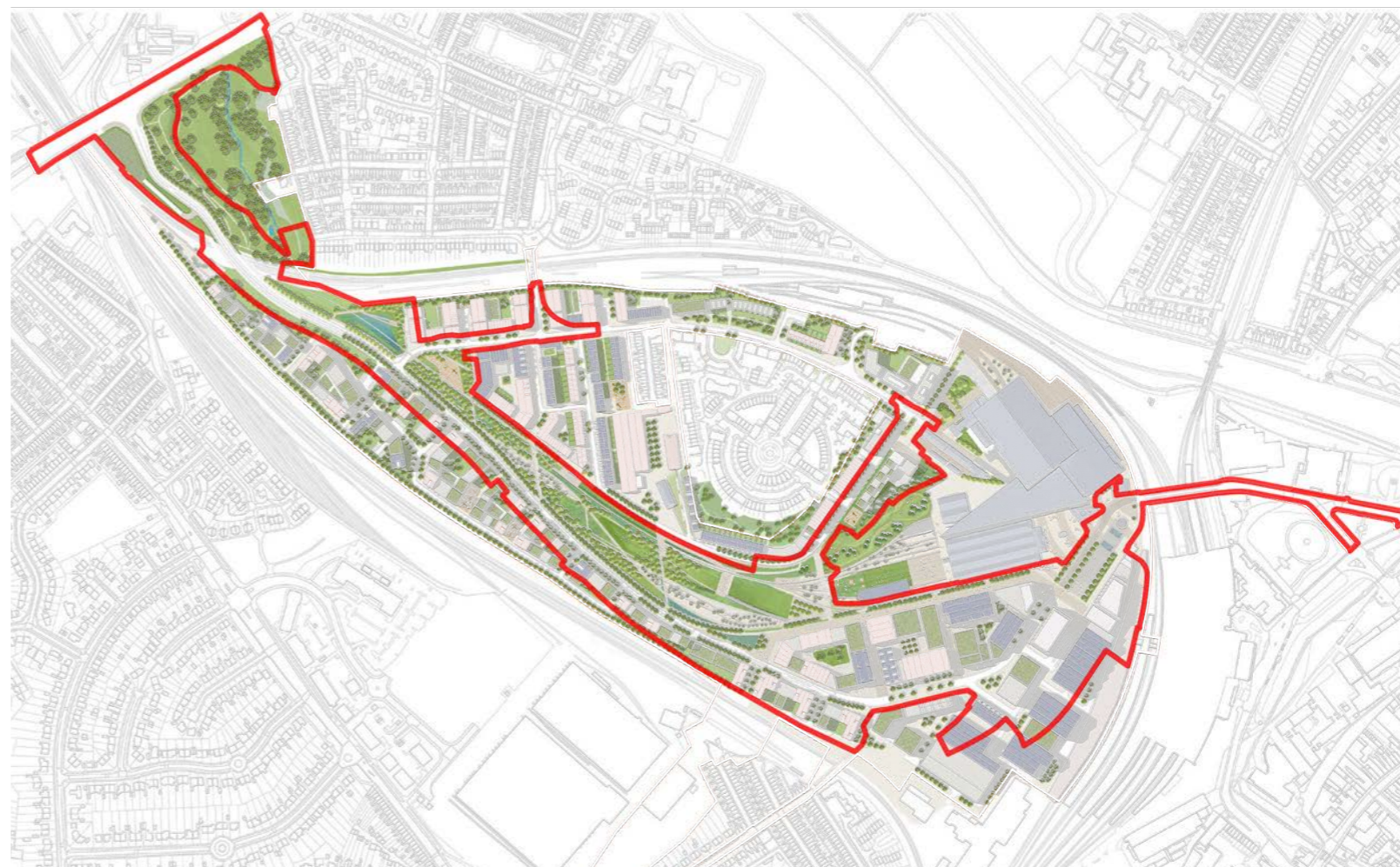
The York Central Lighting Masterplan that was submitted within the Outline Planning Permission (OPP) provides guidance around philosophy of identity, placemaking, legibility, sustainability, safety and longevity of the lit night time environment. The lighting proposal within this Phase 1 Infrastructure Reserved Matters Application (RMA) has been developed following the principles/requirements described within the Masterplan.

The York Central Phase 1 Infrastructure RMA scheme consists of the following lit elements:

- Main routes and associated areas
- Bridges
 - East Coast Mainline Bridge
 - Severus Pedestrian and Cycle Bridge
- Leeman Road Tunnel

This RMA scheme document presents the Outline Lighting Strategy for Phase 1 Infrastructure RMA. This is a supporting document to the Design Statement provided as part of the Phase 1 Infrastructure RMA in line with the requirements set out in Condition 22 of the OPP.

Leeman Road Tunnel requires only statutory lighting to improve safety for cyclists and vehicles within the tunnel. The future lighting enhancement scheme and environmental improvements will follow in a separate RMA.



Overview of York Central Phase 1

7 Lighting Strategy

7.1 OVERVIEW

OVERVIEW

Lighting to routes have been developed considering the following key user types:

- Pedestrian;
- Cycleways; and
- Vehicular.

The proposed Phase 1 Infrastructure RMA scheme will provide key infrastructure and spine routes into York Central, unlocking and facilitating the development of plots. The lighting provision will support this purpose, providing appropriate and functional lighting for key routes that upholds the environmental and sustainable aspirations for the scheme and also deliver a visually engaging environment.

The proposed lighting treatment has been designed to provide consistent illumination for each type of user along the varying sections of roads, cycleways, paths and parks, and take into account conflict areas where independent traffic streams merge or intersect. The lighting approach for the user type has been applied for each area of the site considering the character areas as defined within the York Central 'Design Guide' and as interpreted within the York Central 'Lighting Masterplan'.

7 Lighting Strategy

7.2 ROUTES

LIGHTING CHARACTER OF VEHICULAR ROUTES

- Higher light levels to the ground plane (revealing objects in negative illumination)
- Generally lower light levels to the vertical plane
- Ensuring no glare to drivers
- Elevated light levels at junctions and crossings (revealing objects in positive illumination)
- Lighting to surrounds relative to vehicular route to provide wider view and ensure visibility of pedestrians or other potential hazards in the adjacent routes

LIGHTING CHARACTER OF CYCLIST ROUTES

- Moderate light levels to the ground plane
- Moderate light levels to the vertical plane (facial illumination)
- Managed glare to cyclists
- Elevated light levels at junctions and crossings (revealing objects in positive illumination)
- General lighting to surrounds (up to 2m) to provide wider view and ensure visibility of pedestrians or other potential hazards in the adjacent routes

LIGHTING CHARACTER OF PEDESTRIAN ROUTES

- Lower light levels to the ground plane
- Higher light levels to the vertical plane (facial illumination for increased perception of safety)
- Managed glare to pedestrians and spill into surrounding ecologically sensitive areas.
- Elevated light levels at junctions and crossings (serving as beacons or waymarkers)
- General lighting to surrounds (up to 2m) to provide wider view and give more confidence for route users



Illuminated surfaces for each route type

7 Lighting Strategy

7.3 RESPONSE TO ECOLOGY

The lighting strategy places a respect for the environment and ecology at its core. It sets out to minimise its environmental impact principally by:

- Preventing spill lighting onto parkland and ecological areas minimising light incident on sensitive ecological receptors;
- Reducing light pollution to the sky and private properties; and
- Minimising energy consumptions.

These goals have been achieved via the following key aspects of the lighting design:

- The location and typologies of lighting columns, etc.;
- The use of modern luminaires with high efficiency light sources, high quality optics and optical accessories; and
- The use of a configurable lighting controls system integrated with any existing CYC central management system (CMS) infrastructure.

The graphic opposite shows the distribution of residential, commercial and ecological areas along the Phase 1 Infrastructure RMA. Their proximity and configuration has influenced the lighting design and proposed lighting treatment.

In unison, the aspirations have been achieved without compromising the quality and visual consistency of the lit environment to the various unique areas throughout.



7 Lighting Strategy

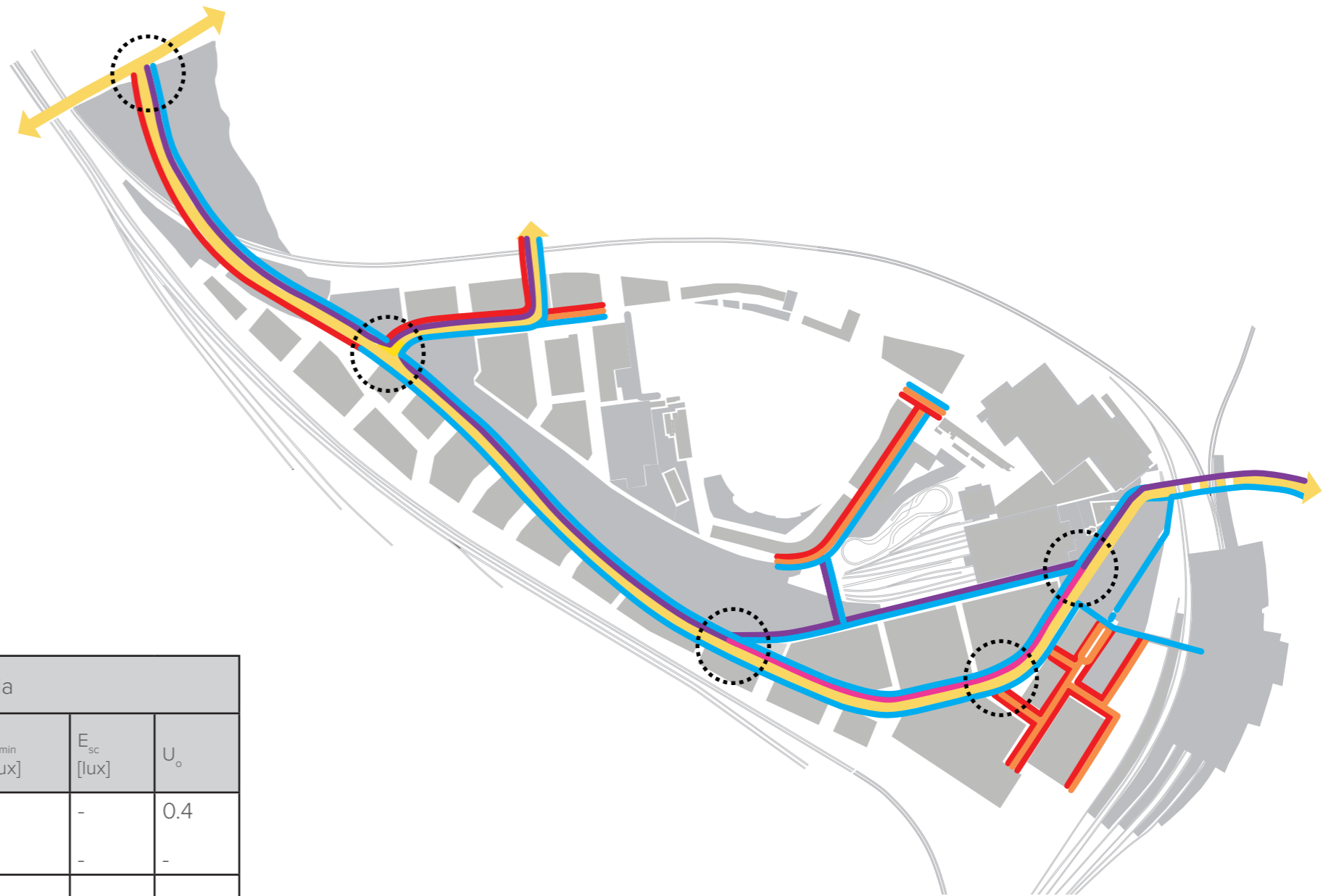
7.4 LIGHTING CRITERIA

Generally, the Phase 1 Infrastructure RMA lighting design has been developed in line with the following guidance and recommendations and will be deemed to meet the requirements of the formal national standards:

- BS 5489-1:2013 - Code of practice for the design of road lighting - Lighting roads and public amenity areas;
- BS EN 13201-2:2015 - Road lighting performance requirements;
- CIE 115:201 Technical Report - Lighting of roads for motor and pedestrian traffic;
- ILP GN01:2020 - Guidance notes for the reduction of obtrusive light;
- City of York Council Street Lighting Policy - Annex 1 - First Edition; and
- York Central Design Guide produced by Allies & Morrison.
- York Central Lighting Masterplan provided by Arup

Appropriate lighting criteria for the phase 1 Infrastructure RMA have been selected in response to the lighting criteria developed for the wider Masterplan to ensure a seamless transition with future phases.

Type	Lighting Class	Lighting Design Criteria				
		L _{av} [cd/m ²]	E _{av} [lux]	E _{min} [lux]	E _{sc} [lux]	U _o
Vehicular route - primary	ME3	≥ 1.00	-	-	-	0.4
	P1	-	15	3	-	-
Conflict areas (junctions where motorised traffic intersects with other road users)	CE2	-	20	-	2.0	0.4
Cyclist route	P3	-	7.5	1.5	1.5	-
Pedestrian Route - Encouraged	P4	-	5.0	1.0	1.0	-
Pedestrian Route - Discouraged	P5	-	3.0	0.6	-	-



Overview of Routes along the Phase 1 Infrastructure RMA

- ⊙ Conflict Area
- Yellow Vehicular Route - Primary
- Orange Vehicular Route - Secondary
- Purple Cycle Route
- Pink Mixed Vehicular and Cycle Route
- Blue Pedestrian Route - Encouraged
- Red Pedestrian Route - Discouraged

7 Lighting Strategy

7.5 LIGHTING EQUIPMENT / TYPES

A coherent family of column mounted luminaires providing visual consistency in luminaire and column aesthetic to all routes.

An initial analysis of column height and corresponding column spacing was undertaken to develop a strategy/ basis of design for the whole route.

A hierarchy of standard mounting heights, shown in the adjacent figure, is proposed for use:

- 10m multi-head columns are not used within Phase 1 Infrastructure RMA, but are included within the family as they are proposed for adjacent plazas within future phases.
- 8m in areas where the infrastructure corridor will be illuminated adjacent to open plazas and pedestrian zones, to increase spacings and minimise the visual clutter at low level
- 6m in areas where compromises between visual clutter from residential balconies and ecology require more delicate, contained treatment
- 4m to cycleways and pedestrian walkways, and where further mitigation of spill light to ecology is of benefit.
- 3m tall bollard for pedestrian walkways

This hierarchy is paired with standard pole mounting or outreach brackets where necessary to provide improved coverage.

Column mounted luminaires used for general lighting along roadways and footpaths will have no tilt, to further minimise the risk of glare or obtrusive light.

COLUMN OFFSET

The lighting column offsets are proposed to be consistent throughout, while ensuring that any pedestrian routes retain a minimum 1.5m clear width for inclusive mobility:

- 0.8m from the road; and
- 0.5m from cycleways.

COLUMN REQUIREMENTS

Lighting columns will meet the requirements within the CYC Street Lighting Policy.

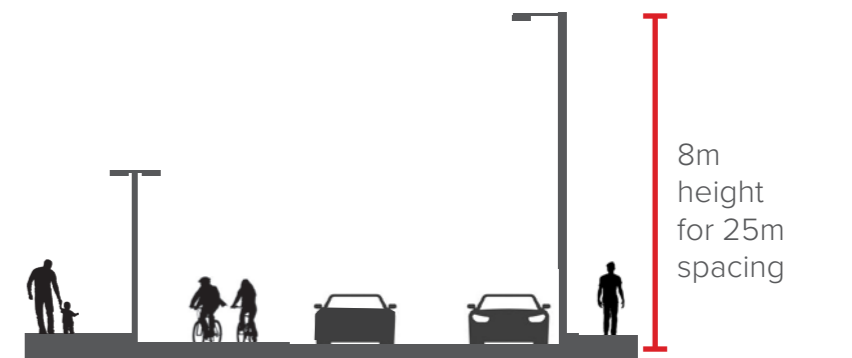
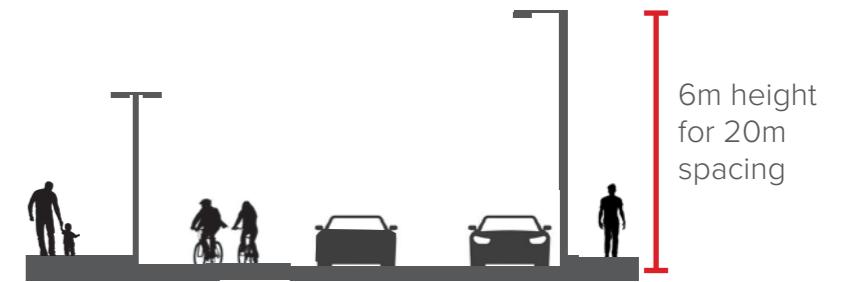
Columns to be of mild steel construction with a guaranteed design life of 40 years.

Columns to be sized to support:

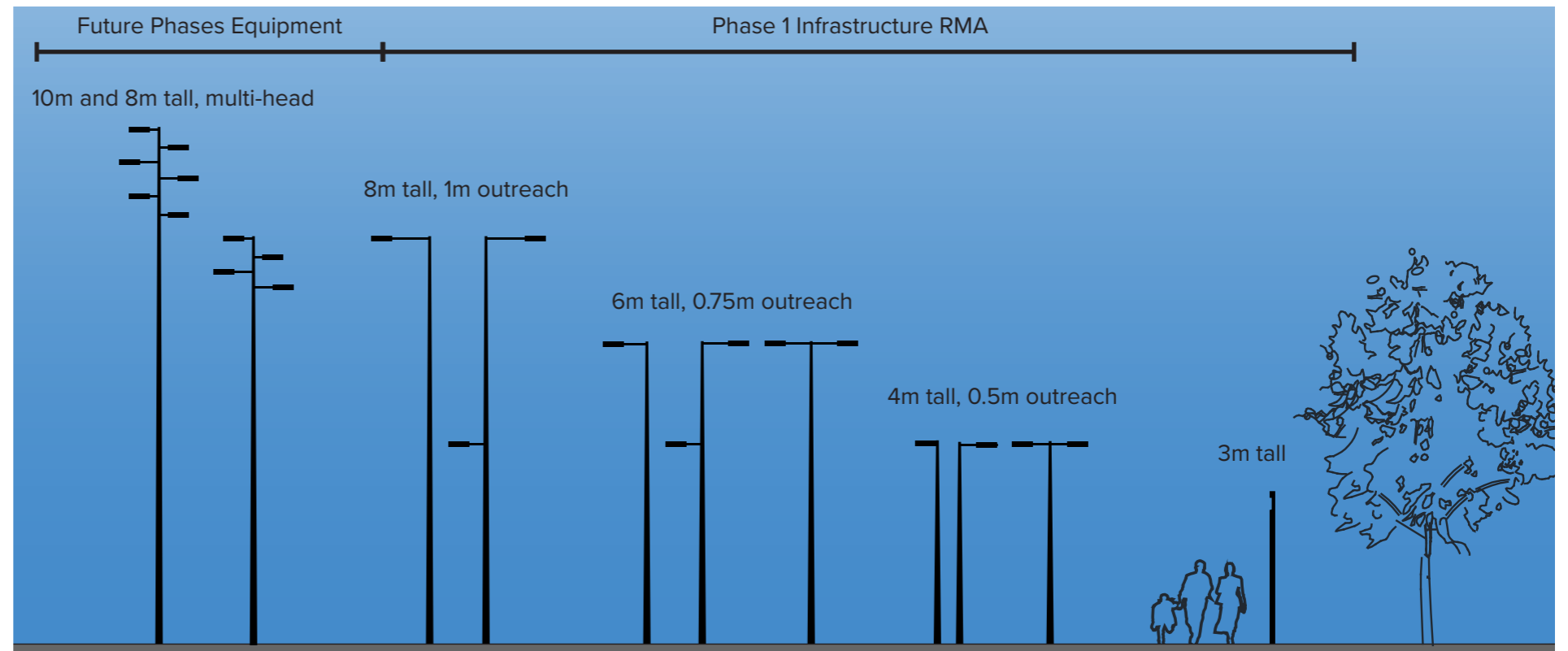
- 1no. Lantern on 1m outreach at 8m with 0deg inclination
- 1no. Lantern on 0.5m outreach at 4m with 0deg inclination
- 0.6m² sign at 2.4m mounting height

Lighting columns to be painted galvanised steel. Column and bracket manufacturer shall be registered with an accredited under the Quality Assurance Scheme ISO 9002 for the manufacturer, supply and verification of lighting columns.

Columns and brackets shall be hot dipped galvanized to BS EN ISO 1461 at the fabrication factory with any additional protection against corrosion in accordance with Series 1900 of the Specification for Highways Works. All columns and brackets shall be painted with RAL colour to be agreed with CYC.



Initial analysis of column height and spacing to develop strategy for the whole route



Extract from York Central Lighting Masterplan; lighting equipment typologies - mounting height and outreach arms relative to streetscape.

7 Lighting Strategy

7.6 COLOUR TEMPERATURE

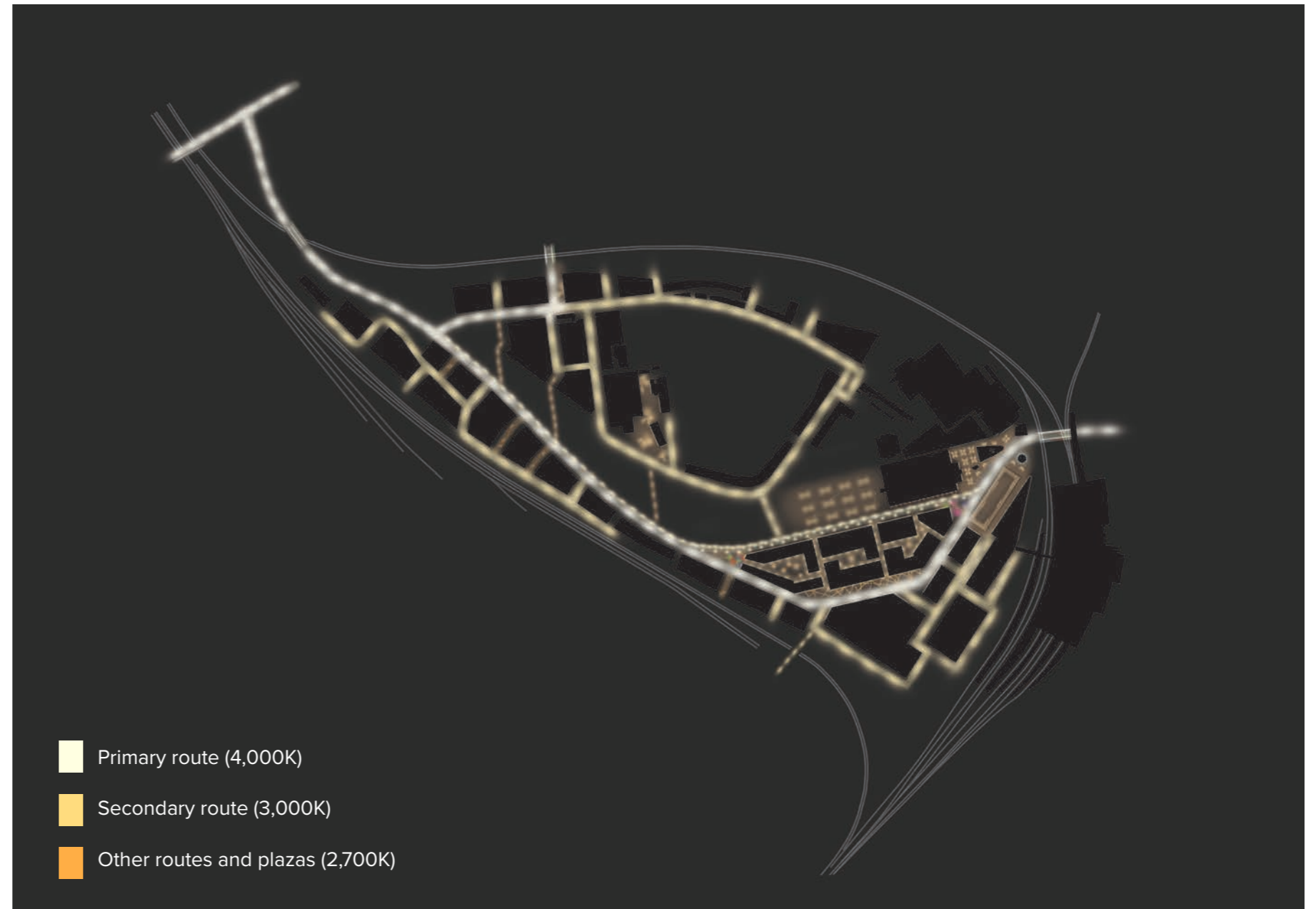
COLOUR TEMPERATURE

Correlated colour temperature (CCT) and coloured lighting strategically used to provide intuitive differentiation between routes and areas within the development in line with York Central Lighting Masterplan.

The following set of colour temperatures has been selected to provide a gradient from cool to warm, reinforcing a similar transition from purely functional illumination to illumination for ambiance and spatial character:

- 4,000K for the Primary route
- 3,000K for Secondary route
- 2,700K for all other routes and plazas.

All lighting within Phase 1 Infrastructure RMA will be white light with a colour rendering property of $Ra > 80$.



Overview of routes with corresponding CCT

7 Lighting Strategy

7.7 BRIDGES

Two bridges part of the Phase 1 Infrastructure RMA are:

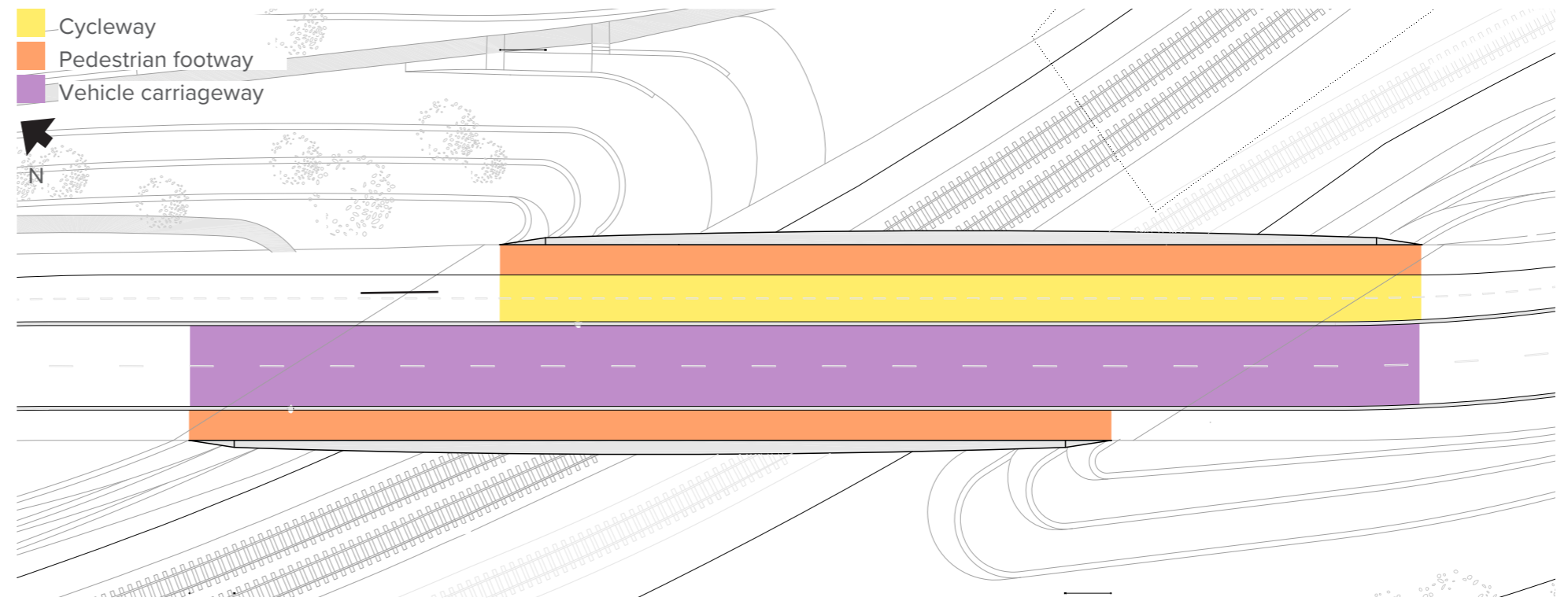
- East Coast Mainline Bridge
- Severus Pedestrian and Cycle Bridge

The East Coast Mainline Bridge will link the Water End to the west with York Central and the city. This bridge consists of a segregated vehicular route, cycleway, and a pedestrian footway on each side.

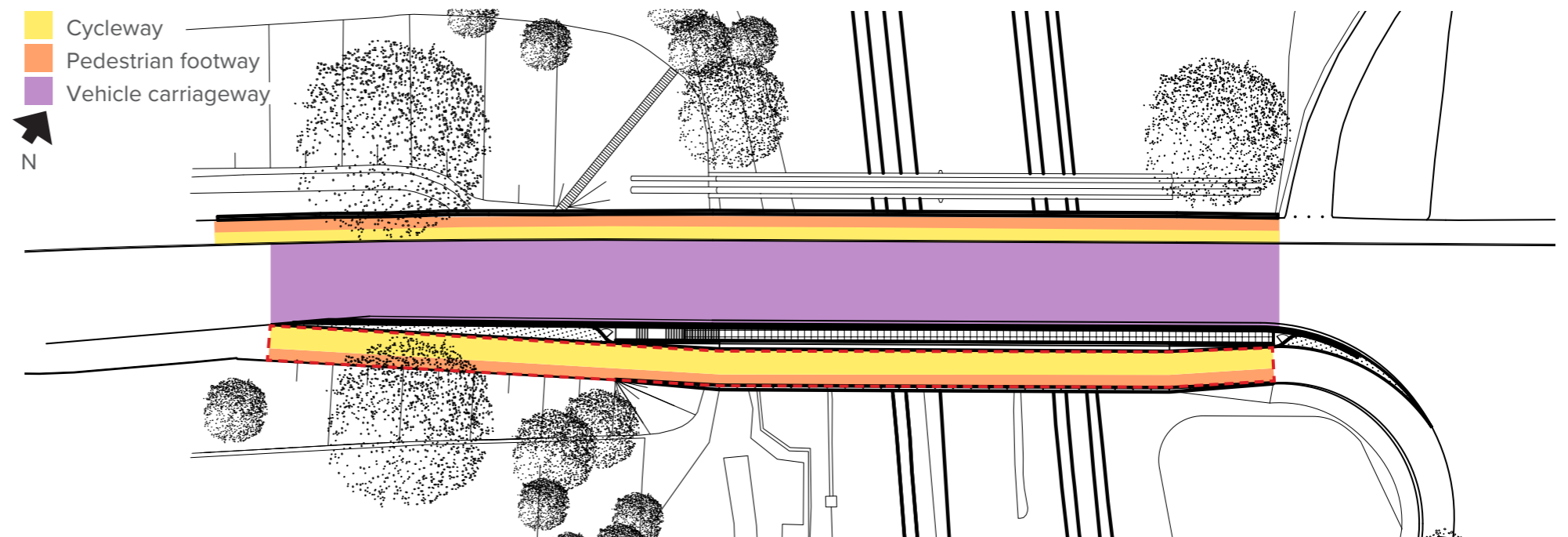
The lighting requirements have been developed to respond directly to the differing uses and requirements of the traffic routes:

- Carriageway
- Cycleway; and
- Pedestrian footway.

The Severus Pedestrian and Cycle Bridge located to the west of the York Central development consists of an existing bridge which will be widened, with a new bridge structure to incorporate a cycleway and a pedestrian footway, for which a design has been provided within this document. The existing lighting to the carriageway and existing cycle land and footway is not proposed to be altered, however the current level of provision will be maintained which may require minor adjustment to the lighting position.



Plan of the proposed East Coast Mainline Bridge



Plan of the proposed Severus Pedestrian and Cycle Bridge; only the lines highlighted in red will have lighting design provided

7 Lighting Strategy

7.7 BRIDGES

LIGHTING CLASSIFICATION

The lighting criteria has been selected to provide appropriate illumination for each user type:

- Consideration of the transition from the road/pathway lighting adjacent to the bridge onto the bridge;
- Adequate horizontal illumination to the carriageway; and
- Adequate horizontal and vertical illumination for the pedestrian footways and cycleways.

Lighting to the road and pedestrian footways/ cycleway tends to the use of columns due to the width. However, for the following reasons the use of columns on the bridge span is undesirable:

- Risk of column knock down resulting in column onto the East Coast Mainline or associated overhead lines;
- Access for maintenance of equipment at height on the deck;
- Positioning of columns on an elevated position, such as results in increased light spill into adjacent ecological areas;
- Increased visibility to the train drivers and obtrusive light from a distance; and
- Adverse affects and daytime appearance of silhouetted columns on the bridge deck and the architectural form of the bridge.

In response the proposal is to utilise lighting mounted at a reduced elevation to mitigate these effects. However, low mounted solutions can prove challenging to demonstrate horizontal illuminance on a surface. An alternative target criteria is therefore proposed for the pedestrian footway and cycleway:

PEDESTRIAN FOOTWAY

- Reduction in horizontal illuminance; and
- Enhanced vertical illumination to aid facial recognition and a sense of safety.

Arup proposes that the horizontal lighting component can be reasonably reduced by one classification step as the horizontal surface is expected to be finished level and this will classification will sufficiently illuminate obstacles on the ground. The vertical illumination in an enclosed footway is considered to be more important on the bridge span contained between the barrier and parapet and therefore the vertical illuminance is proposed to be enhanced by one classification step.

Lighting Class	Lighting Design Criteria				
	Lav [cd/m ²]	E _{av} [lux]	E _{min} [lux]	E _{sc} [lux]	U _o
ME3	≥ 1.00	-	-	-	0.4
Or equivalent P1 class		15	3		

Proposed lighting criteria for the vehicular carriageway on East Coast Mainline Bridge

Type	Criteria	Lighting Class	Lighting Design Criteria			
			E _{av} [lux]	E _{min} [lux]	E _{v,min} [lux]	E _{sc,min} [lux]
Cycleway	York Central Lighting Masterplan	P2	10	2	3	2
	Proposed Alternative	P2, no vertical requirement	10	2	-	-
Pedestrian Footway north side of bridge (adjacent to cycleway); encouraged route.	York Central Lighting Masterplan	P4	5	1	1.5	1
	Proposed Alternative	Combined P3 / P5	3	0.6	2.5	1.5
Pedestrian Footway south side of bridge; discouraged route.	York Central Lighting Masterplan	P6	2	0.4	0.6	0.2
	Proposed Alternative	P6	2	0.4	0.6	0.2

Proposed lighting criteria for the cycleway and pedestrian footways. The standard and proposed alternative criteria are provided. Where the criteria have changed they have been marked red from the standard criteria, and green for the proposed alternative criteria

CYCLEWAY

- Reduction in vertical illumination.

It is proposed that for the cycleway the vertical component is not considered important at 1.5m, as the cyclists will be clearly visible as they pass through the light at their waist level. As such this requirement is proposed to be relaxed to aid in the reduction of wasted light upwards, as light pollution out of the boundaries of the bridge.

However, good horizontal lighting is still required to clearly identify any obstructions on the ground when being approached at speed.

The table above demonstrates the proposed requirements of the East Coast Mainline carriageway, and the alternative criteria for the footways / cycleways compared to the York Central Lighting Masterplan.

7 Lighting Strategy

7.7.1 BRIDGES - EAST COAST MAIN LINE

DESIGN STRATEGY

Some key considerations for the design strategy are as follows:

MOUNTING HEIGHT

Luminaires to be mounted at low level to:

- Remove columns and mitigate the risk of columns being knocked into the carriageway or onto the railway below.
- Limit driver visibility of light sources.
- Retain the silhouette and simplicity of the bridge architectural form when viewed from a distance or on deck.
- Improve pedestrian and cyclist experience by providing good facial/vertical lighting to assist in threat assessment.

LUMINANCE OF SOURCES FOR TRAIN DRIVERS

The luminance of sources has been considered for train drivers to prevent glare. This has been achieved by ensuring that light sources are not visible by train drivers.

SPILL LIGHT

The photometric distribution of luminaires has been focussed below the horizontal plane to minimise light pollution directly into the sky. Cowls and baffles will be integrated into the luminaire design to limit upward light spill.

The mounting height of luminaires shall also be low-level. This ensures that the cone of light from a luminaire is closer to the ground and less intrusive to the flight corridor of nocturnal species, including bats at higher levels.

Where possible, the luminaires have been orientated to emit light away from the surrounding parkland, minimising direct visibility of light sources from beyond the deck and parkland. Where this is unavoidable, louvres will be integrated into the luminaire to direct light along the bridge.

FLICKER FREQUENCY

Special attention has been given to avoid flicker frequency affecting drivers caused by inappropriately spaced light sources. Negative effects can be experienced if the speed of a driver correlates with the spacing of light sources.

The table below shows luminaire spacing in relation to vehicle speeds that have been considered to avoid the effect of flicker. BS 5489-2 states that the flicker frequency must fall outside of 2.5 Hz to 15.0 Hz range as shown by the red cells.

It is considered that a vehicle may exceed the 20mph speed limit and travel at 30 mph, at which point spacing of luminaires must exceed 6.0m, though to deliver the low-level lighting solution spacings of less than 6.0m will be required. Conversely, it is considered that there may be periods of slower travel which could result in requirements of spacings less than 0.5m. Therefore, the risk of the effects of flicker have been reduced by providing a continuous lighting solution.

Speed, mph	Speed, m/s	Spacing of luminaires, centre to centre, m											
		0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.25	3.25	4.25	5.25	6.25
5	2.2	4.5	3.0	2.2	1.8	1.5	1.3	1.1	1.0	0.7	0.5	0.4	0.4
10	4.5	8.9	6.0	4.5	3.6	3.0	2.6	2.2	2.0	1.4	1.1	0.9	0.7
15	6.7	13.4	8.9	6.7	5.4	4.5	3.8	3.4	3.0	2.1	1.6	1.3	1.1
20	8.9	17.9	11.9	8.9	7.2	6.0	5.1	4.5	4.0	2.8	2.1	1.7	1.4
25	11.2	22.4	14.9	11.2	8.9	7.5	6.4	5.6	5.0	3.4	2.6	2.1	1.8
30	13.4	26.8	17.9	13.4	10.7	8.9	7.7	6.7	6.0	4.1	3.2	2.6	2.1
		Flicker frequency, Hz											

Flicker frequency of light fittings compared to speed and luminaire centre-to-centres

7 Lighting Strategy

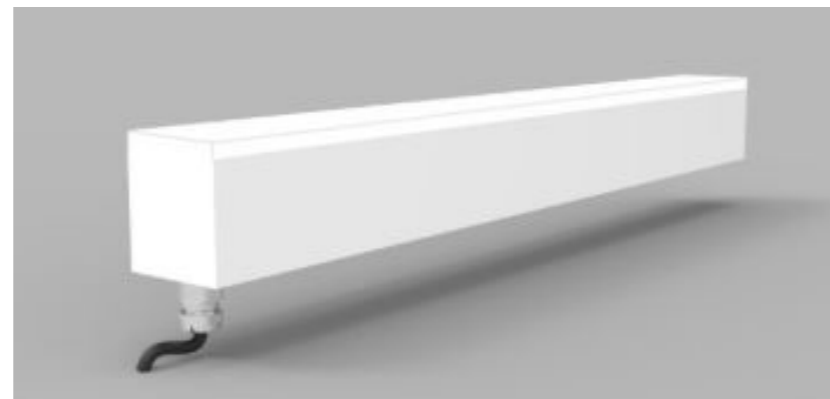
7.7.1 BRIDGES - EAST COAST MAIN LINE

CARRIAGEWAY

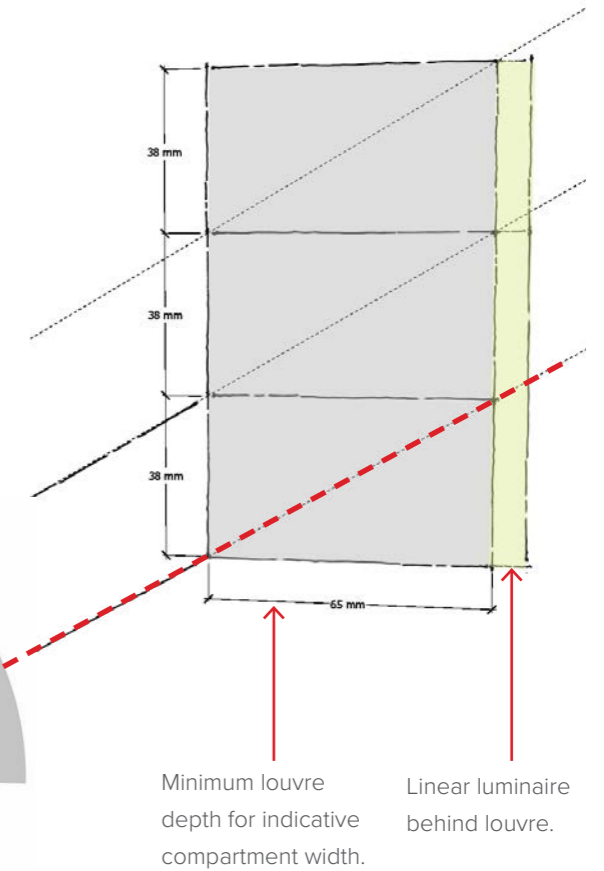
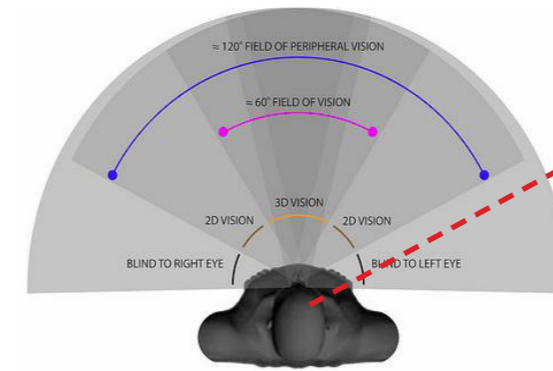
To illuminate the vehicular carriageway surface, a continuous linear lighting solution has been proposed to minimise the effects of flicker. The linear luminaires will be “off-the-shelf” products for future ease of maintenance.

The luminaire source will be shielded by custom louvres to control the direct view in the driver’s visual field to reduce the risk of glare.

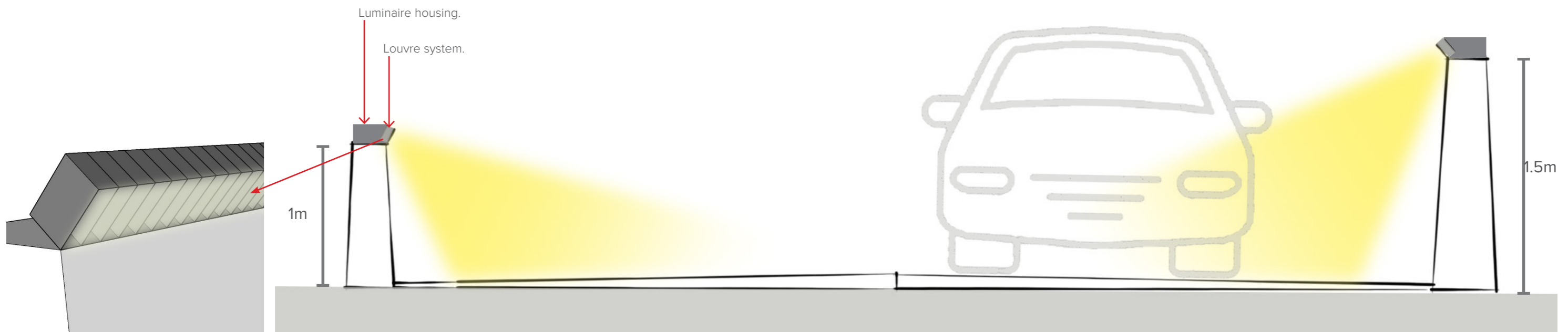
Through a series of analysis using parametric modelling and ‘Radiance’ lighting calculation software, louvre size and intensity has been determined that meets lighting requirement as well as aiding glare control.



Example of “off-the-shelf” luminaire to be used with custom baffles



Plan sketch demonstrating the angle used to determine the louvre geometry



Louvre lighting system

Sectional sketch through carriageway showing luminaire louvre system and housing behind.

7 Lighting Strategy

7.7.1 BRIDGES - EAST COAST MAIN LINE

CYCLE PATH AND PEDESTRIAN FOOTWAY

A continuous linear lighting solution along the length of the bridge has been proposed to provide the illumination of both the footway and cycle path using similar luminaires to the carriageway. These will be integrated within a custom louvre system to prevent light spill into the ecologically sensitive parkland beyond the glass barrier.

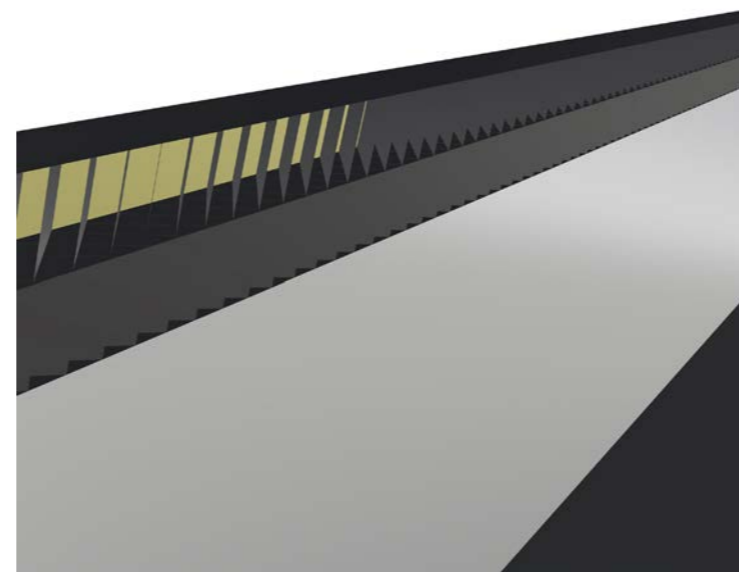
The design uses standard 'off-the-shelf' products in a robust custom housing ensuring the longevity of the design.

LOUVRES

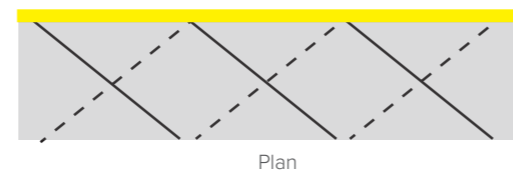
The angles of the louvres have been positioned to only allow light incident on the glass barrier to be greater than the critical angle of the glass barrier (approximately 41°), thus ensuring that the majority of light is reflected back into the bridge rather than passing through the glass surface. While theoretically all light would be reflected back into the bridge, in practice due to imperfections in materials there will likely be some light spill through the glass.

The louvre system has been initially developed for proof of concept. The design has 75mm depth to ensure a reasonable build up on top of the barrier. The 75mm depth and the 41° louvre system results in a spacing of 50mm between the louvres. The design of the louvres and luminaire configuration will continue throughout Detail Design development.

Two rows of louvres are provided orientated in opposite directions, providing diffuse light continuously on the vertical plane in both directions along the length of the bridge.



3D computer model of the luminaire optical system

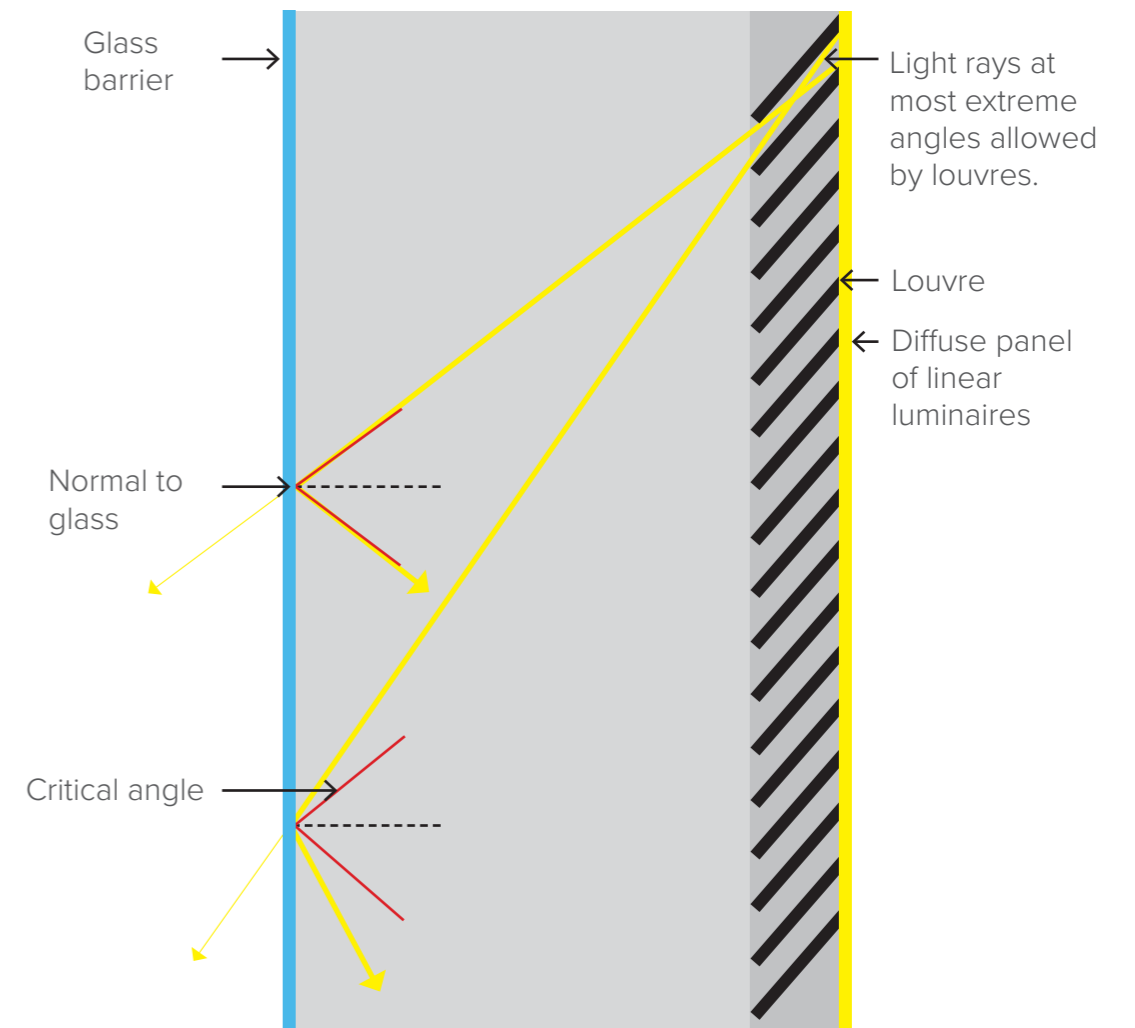


Plan



Elevation

Plan and elevational sketches demonstrating the two rows of louvres orientated in opposite directions.



Louvre design on plan

7 Lighting Strategy

7.7.2 BRIDGES - SEVERUS PEDESTRIAN AND CYCLE BRIDGE

SEVERUS PEDESTRIAN AND CYCLE BRIDGE

The Severus Pedestrian and Cycle Bridge consists of an existing vehicle carriageway with a narrow pedestrian footway. A new dedicated bridge carrying a pedestrian footway and a cycleway will be part of the Phase 1 Infrastructure RMA scheme.

The lighting concept is to encourage the use of the new dedicated footbridge and cycleway through the provision of a well lit and welcoming route.

It is not the intention to revise or amend the current lighting provision to the existing highway carriageway bridge span.

The pedestrian footway and the cycleway will be illuminated by a single continuous linear lighting element incorporated into the top of the inboard parapet structure.

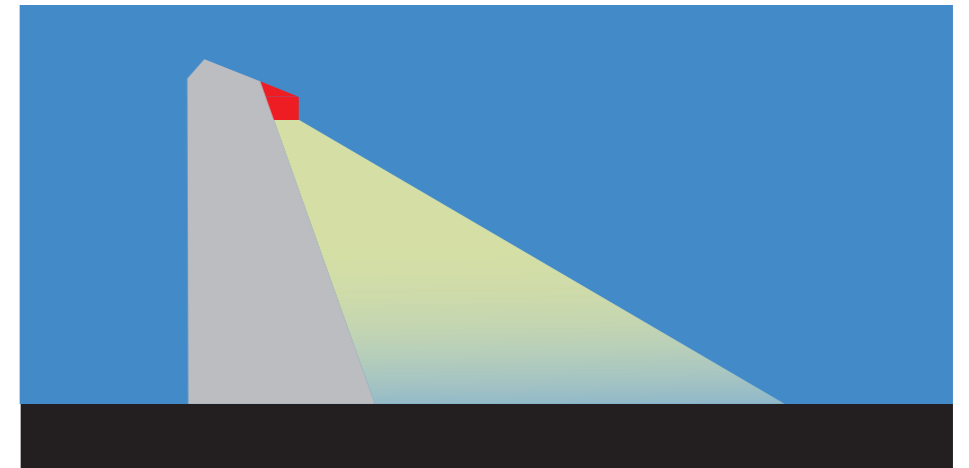
A standard IP65 (or greater) linear luminaire with a diffuse distribution will be inserted into the parapet construction with a downward component to wash the clad barrier.

The light distribution will be shielded to prevent upward light spill or problematic direct visibility from the train drivers below.

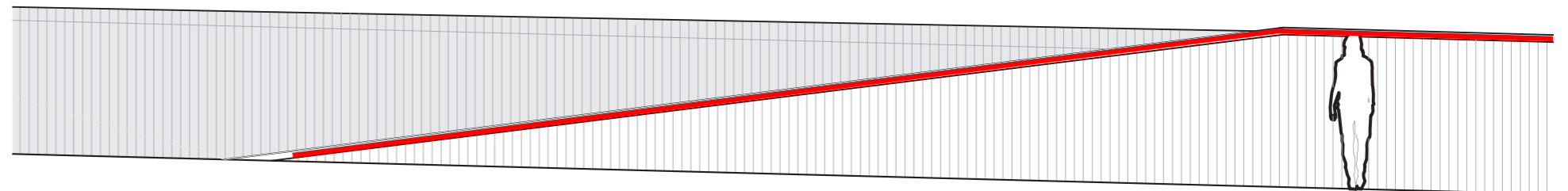
Luminaires will be positioned and mounted so to provide a continuous uniform line of light with the bridge structure.

The top of the wall expresses a slight curvature due to the architecture of the bridge. Standard linear products will be faceted along the length to accommodate the curve.

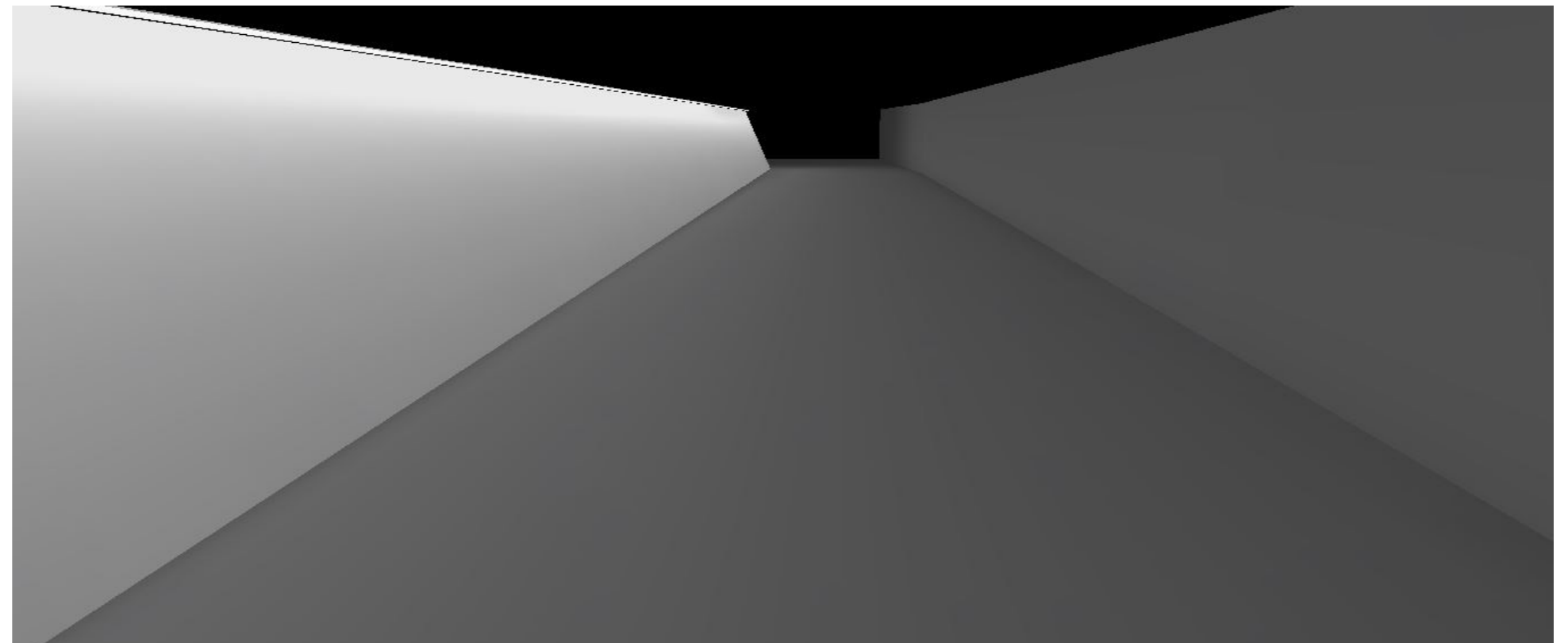
The luminaire will extend where the wall inclines to the ground.



Section showing indicative mounting of luminaire and channel.



Elevation view of the inboard parapet structure showing indicative location of luminaire in red and how the luminaire will continue down the inclined edge to the ground.



Perspective view looking down the pedestrian footway and cycleway showing the linear luminaire and the intended lit effect on the parapet.

7 Lighting Strategy

7.8 LIGHTING CONTROLS

All highway and bridge lighting will be photocell controlled to ensure luminaires are only active through hours of darkness.

Luminaires and lanterns will be fitted with DALI addressable drivers allowing for future connection of a CMS and two-way communication, such as fault reporting or device self-diagnostics.

The DALI drivers will have the facility to be pre-programmed step-down dimming. Dimming levels and timings will be discussed and agreed with CYC Highways Department prior to installation.

Highway lanterns will look to employ constant light output (CLO) drivers to prevent over lighting at day one, reducing energy usage and extending the life of the LED sources.

A 7 pin NEMA sockets will be integrated into lantern/column heads and connect to the DALI drivers allowing for the Photo Electric Control Unit (PECU) to be installed at commissioning. Where this may not be possible, such as on columns less than 5m tall or bridge integrated pedestrian/cyclist lighting, an appropriate solution will be discussed and agreed with CYC prior to commencing installation. This may include the use of a fixed miniature photocell integrated into the luminaire housing , or nearby taller columns

7 Lighting Strategy

7.9 DEROGATION FROM YORK CENTRAL LIGHTING MASTERPLAN

The lighting strategy fully follows the lighting philosophy and criteria of York Central Lighting Masterplan. However for pedestrian and cyclist routes within East Coast Mainline Bridge alternative lighting criteria values have been proposed that are tailored specifically for this situation.

It has been proposed that the horizontal lighting component can be reasonably reduced as the horizontal surface is expected to have minimal discrepancies in finish as a newly constructed pavement. Conversely, the vertical illumination in an enclosed pathway is highly important to instil a feeling of safety for users.

For these reasons, the target lighting classes have been decreased for the horizontal but increased for the vertical.

All other aspects are considered to conform to the guidance stated within the York Central Lighting Masterplan.

- 8.1 Design Standards
- 8.2 Access Aims
- 8.3 General Provisions
- 8.4 Access Network
 - 8.4.1 Existing Highway Network
 - 8.4.2 Proposed New Access
- 8.5 Pedestrian Access
 - 8.5.1 Existing Pedestrian Infrastructure
 - 8.5.2 Proposed Pedestrian Infrastructure
- 8.6 Cycle Infrastructure
- 8.7 Bus Services
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 - 8.8.1 York Railway Station Drop-off
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- 8.9 Rail Services
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- 8.11 Vehicular Access
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- 8.12 Car Parking
 - 8.12.1 Existing Parking
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 - 8.12.3 Temporary Car Parking

8 ACCESS

8. Access

This chapter describes how the design proposals have developed with consideration and understanding of the principles of inclusive design.

The scheme has been designed with specific regard to disabled people as:

- Residents of the development;
- Visitors to the various buildings within the York;
- Visitors to the development; and
- People working in and visiting the commercial spaces.

The report considers how accessible the Phase 1 Infrastructure proposed as part of this RMA are for entry into the York Central masterplan area, via both the principal roads and the pedestrian and cycle routes at ground level.

8.1 DESIGN STANDARDS

The main access standards and regulations referred to in writing the access statement are:

- The Building Regulations 2010, Approved Document M – Access to and use of buildings, (2015 edition incorporating 2016 amendments), HMSO, 2015;
- The Building Regulations 2010, Approved document K – Protection from falling, collision and impact, HMSO, 2013;
- BS 8300-2:2018 (amended 2018), Design of an accessible and inclusive built environment, British Standards Institution, 2018; and
- BS 9999:2017, Fire safety in the design, management and use of buildings - code of practice (Incorporating corrigendum No. 1), British Standards Institution, 2017.

Interpretation of the standards

While frequently used documents such as Approved Document M and BS 8300-2:2018 Design of an accessible and inclusive built environment, provide general advice, other guidance may be more specific.

Access standards are in a continuing state of development

with no single authoritative document as a source of reference. Instead several separately authored documents have to be referred to, inevitably revealing anomalies and contradictions. This chapter also seeks to interpret those standards where there is an absence of clarity.

8.2 ACCESS AIMS

The overarching aims of the Masterplan is to achieve the following as part of the design development process:

- To maximise access to all parts of the proposed development, its facilities and services for people who are residents, visitors and members of staff regardless of disability and as required by local, regional and national policy;
- To ensure that required standards for accessibility are met at the outset and as part of mainstream inclusive design wherever possible;
- To design inclusively, which means designing beyond the minimum requirements of the Building Regulations Part M to ensure that all people, regardless of age, sex or ability can use and enjoy the built environment;
- To address the anticipated, substantial increase of older people in proportion to the working-age population and their future needs;
- To meet the aims of the Equality Act (2010), where applicable; and
- To follow design guidance given in relevant British Standards and other currently published good practice guidance about meeting the needs of disabled people and inclusive design.

This Phase 1 Infrastructure RMA seeks to provide a new highway, cycle and pedestrian network which meets with these stated aim and objectives.

8.3 GENERAL PROVISIONS

The key access provisions for this Phase 1 Infrastructure RMA include:

- Incorporation of the principles for inclusive design
- Accessible, safe and attractive access to form the permeable links across the Development and to connect to existing links.
- Adjoining pedestrian routes will be created, accommodating level changes in the most inclusive and sustainable way possible to reach the different parts of the site.
- Accessible drop-off points will be provided at key points for passengers of cars, taxis or minibuses so that walking distances are reduced to a minimum.

8.4 ACCESS NETWORK

8.4.1 Existing Highway Network

Strategic Highway Network

York is enclosed by its Outer Ring Road (A1237 and A64) while an Inner Ring Road (A1036) surrounds the City Centre and passes through the east of the York Central site in front of York Railway Station.

The A64, which forms the western and southern sections of the York Outer Ring Road, connects the city with Leeds to the south-west and Scarborough to the north-east. It also connects to the A1(M) to the south-west of York.

The A1237 forms the eastern and northern sections of the Outer Ring Road. From the Outer Ring Road to the north-west of the city centre, The A19 connects north of York to Middlesbrough. South of the York, the A19 connects south of York to Selby.

The A59, which passes close to the south of the York Central site (Poppleton Road/Holgate Road), connects York to the A1(M), which is a major motorway running in a north-south direction to the west of the city. The A1079 links York from the Outer Ring Road (south-east of the city centre) to Beverley and Hull in the east. The A166 connects York with Bridlington to the North-East.

Local Highway Network

There are a limited number of roads located within the York Central site. The road network that does exist is in place to connect the National Railway Museum and Bishopfields housing estate to the city centre and to the western parts of York.

The Local Highway network includes the following:

Leeman Road

Leeman Road provides the only current road connection between the city centre and the York Central site. The road is used by the bus services numbers 2 and 10/10A. Due to the number 2 bus being a park and ride service the road experiences a moderately high frequency of bus movements.

Cinder Lane

Cinder Lane is located towards the east of the York Central site to the west of York Railway Station. Cinder Lane also provides access to Network Rail York Campus. The road does not provide further access to other roads on the site and is a no through road.

Water End

Water End is located outside the development site but is an important access route the west of the York Central site. Bus routes 2 and 10/10A both use Water End as part of their routes.

Queens Street/Station Road

Queen Street/Station Road provide access to the York Railway Station (on the east side of the station) forming part of the A1036.

8.4.2 Proposed New Access

The Phase 1 Infrastructure RMA will link Water End to the west to the existing Leeman Road at Leeman Road Tunnel to the east. A new bridge will be constructed over the East Coast Main Line to provide this connection.

8. Access

The new access will connect with Leeman Road and Kingsland Terrace and provide a new route between Leeman Road Island and Leeman Road Tunnel to enable the future development of the National Railway Museum.

The proposals will be integrated with the existing pedestrian, cycle, public transport and vehicular networks and these are described in greater detail in the following sections.

8.5 PEDESTRIAN ACCESS

8.5.1 Existing Pedestrian Infrastructure

The pedestrian infrastructure includes two underpasses on Leeman Road at Kingsland Terrace (Leeman Road Underpass) and the Marble Arch (adjacent the Leeman Road Tunnel), the existing western entrance to York Railway Station, and a pedestrian access from the south-east of the York Central site over the railway to Wilton Rise.

There is an existing shared cycle and footway on Cinder Lane connecting with Wilton Rise via an existing footbridge to the south of the Freight Avoidance lines.

Segregated footways are in place throughout the Bishopfields housing estate. However, there are no pedestrian connections from the Bishopfields housing estate to the York Central Site other than via Leeman Road.

8.5.2 Proposed Pedestrian Infrastructure

The OPP Design and Access Statement set out the key design considerations for pedestrian routes through the development. These are:

- Provisions to ensure the comfort of all pedestrians using the public realm of this project are to include:
- Clear visual links between the entrances to the Site and entrances to buildings;
- A legible layout for visitors;
- A safe pedestrian zone, without traffic and with
- step-free, level or gently-sloping circulation routes;
- Seats and resting places that take the needs of various users into account;

- Various users into account;
- Quiet areas with minimal traffic noise, to facilitate conversation and communication, with particular benefits for people with impaired hearing; and Predictable spaces, facilitating wayfinding for people who are blind or partially sighted.

Water End

A new signalised toucan crossing will be provided on Water End to the southwest of Severus Bridge to connect the existing segregated cycle and foots with a new 4.0m wide foot and cycle bridge to the south of Severus Bridge.

A 3.0m wide shared footway and cycle will be created on the north side of the bridge to replace the sub-standard footway and on-carriage cycle lane.

The new Water End Junction will create two new signalised crossings for pedestrians and cyclists to access the primary segregated routes through the heart of York Central

From Water End to the ECML Bridge segregated footways will be provided on both the north and south of the main carriageway. To improve the environment for pedestrians and cyclists the vehicle restraint barriers will be constructed adjacent the carriageway creating a physical barrier between moving traffic and pedestrians.

The ECML Bridge has been designed with glazed parapets to enable new views to be created across the site and towards the York Minster and to create a pleasant environment for pedestrians.

Millennium Green

The new junction and access road at Water End will be elevated above the Millennium Green. New sloped walking routes with gradients less than 5% will be integrated into landscaped terraces within the park to link the Millennium Green with the new footway across the ECML bridge and into the York Central site.

The existing footpaths within Millennium Green will be upgraded and resurfaced as part of this first phase of works.

Leeman Road Link

From the Park Street junction a 5.5m wide segregated footway and cycleway will provided on the northern side of the carriageway. The south a 2.0m wide footway will be

provided.

Park Street

From the ECML bridge pedestrians will descend into York Central on a segregated footway and cycleway to the junction of Park Street and Leeman Road Link.

From this junction the footway and cycleway has been designed to be part of the future park landscape. A new tree-lined footway will take pedestrians east towards the Station Quarter and the city centre. Informal crossings have been provided at regular intervals to provide connections between the future development sites to the south of Park Street and the proposed Central Park to the north.

Where pedestrians cross the path the cycle lane priority has been provided to pedestrians by ceasing the cycle lane on each side of the intersection. The southern footway is 3.5m wide and will incorporate trees at regular intervals along the length of the street.

Cinder Street

At the west end of Park Street pedestrians will arrive at the junction of Hudson Boulevard and Cinder Street. Cinder Street will take pedestrians through the Station Quarter

The footways to the north and south of the carriageway will be 4.0m wide. A signalised crossing facility will be constructed to establish a direct link to the existing Cinder Lane Footbridge over the rail line to Wilton Rise. This existing bridge will be replaced as part of a future RMA. This crossing point will be supplemented by an unsignalized crossing further to the east.

A new wide signalised crossing is included to provide enhanced connections between Cinder Street, Hudson Boulevard and the west entrance to the York Railway Station.

This will be a 5.0m wide pedestrian crossing to cater for the future needs of the York Central development.

A third signalised crossing will be provided to the north of the Coal Drops to enable pedestrians arriving from the Marble Arch to cross safely to the NRM.

Hudson Boulevard

Hudson Boulevard is a foot street with segregated cycle

provision and will provide a direct route between Park Street and the NRM and city centre for users who are commuting through the York Central.

A generous landscaped median will separate the footway from the cycle lane.

Leeman Road

The Phase 1 Infrastructure RMA will create a pedestrian route around the NRM to retain connectivity between Leeman Road and the station and city centre when the Central Hall of NRM is developed. A junction will be formed to the west of the NRM with Foundry Way.

Foundry Way

Foundry Way will connect Leeman Road with Hudson Boulevard. 2.0m wide Pedestrian footways will be provided to move pedestrians' southwards to the NRM South Yard.

Foundry Way, a secondary street, will provide future connections to residential development plots adjacent to St Peters Quarter. The street will provide access for the NRM to deliver exhibits by road but will be restricted to pedestrians and cyclists until the future residential developments are brought forward.

At the southern end of the street a segregated cycle and footway will be constructed to move pedestrians through the NRM South Yard on a dedicated adopted footway to Hudson Boulevard.

Leeman Road Tunnel and Marble Arch

The current shared cycle and footway provision through Marble Arch will be changed to provide a pedestrian only route. Cyclists will be diverted onto a new segregated provision in the Leeman Road Tunnel creating a safer route for pedestrians moving to and from the city centre. A new pedestrian crossing will be provided immediately to the east of the Marble Arch to connect pedestrians with Scarborough Bridge and the riverside walkway along the Ouse.

There will be no pedestrian provision within the Leeman Road Tunnel.

Leeman Road and Station Rise

The existing southern footway will be upgraded to provide a consistent cross-fall along its length.

8. Access

The northern footway will be widened to 3.0m and a shared pedestrian/cycle route will be created.

A new unsignalized crossing will be provided to the west of the Memorial Gardens to enable pedestrians to link the pedestrian only facilities on each side of the carriageway.

8.6 CYCLE INFRASTRUCTURE

Existing Cycle Infrastructure

York has an extensive network of cycle infrastructure which bounds the Proposed Development. To the west of the site there is a mixture of on-carriageway and off-carriageway cycle lanes on Water End connecting to the shared cycle and footway following the River Ouse towards the City Centre.

To the south there is a shared footway and cycle connection across the rail-lines connecting the Cinder Lane with Wilton Rise and the wider Holgate Community.

To the East of the development the City of York Council have recently completed the construction of a new cycle and foot bridge across the River Ouse at Scarborough Bridge. This new cycle route passes through the Proposed Development boundary.

There is a shared cycle and pedestrian route along Cinder Lane linking to Wilton Rise to the south of the site. There are not cycle specific provision on Leeman Road.

A segregated cycle lane is in place exclusively along the front of the St Peter's Quarter. Cycle lanes are in place either side the section of Queens Street/Station Road which passes through the development site.

Cycle access to the site from the city is provided through Marble Arch. The tunnel space is currently shared between pedestrians and cyclists with delineation of the space made via a painted line only.

On the rest of the local road network cyclists share the road with motorists.

PROPOSED DEVELOPMENT

This Phase 1 Infrastructure RMA incorporates significant cycle infrastructure to improve connectivity to the site from the

existing York cycle network and to provide high quality cycle routes through the new development.

An objective is to provide a new segregated cycle route through the York Central Scheme which can provide a safe and direct link to York cycle network and to enable future access by bike.

The use of shared facilities has been minimised and typically restricted to the approaches to road junctions and future public squares. The scheme does however include shared provision in number of places and these are described below. The design incorporates the use of tactiles to designate the change in the nature of the route which will be supplemented by signage.

At pedestrian crossing points the cycle lanes are ended to provide pedestrians with clear priority.

Where there are slopes on the route, the design of the highway has been developed to maintain a long-fall of less than 5% (1 in 20) to improve the function of the route and to improve its accessibility.

Water End

A number of new changes will be introduced on Water End to connect the existing cycle infrastructure with the new Proposed Development.

A new toucan crossing will be constructed to the south of Severus Bridge to provide a connection between the segregated cycle lane adjacent Water End with the new 4.0m wide shared cycle and foot bridge to be installed on the east side of the Severus Bridge.

For cyclist travelling Eastbound on Water End a shared cycle and footway will be created on the northern footway enabling cyclists to connect with the on-carriageway cycle-lane north of the junction. A toucan cross will also be provided to the north of the Water End Junction to enable cyclists to cross into York Central.

For cyclists traveling Westbound on Water End the segregated cycle lane will merge into a shared space with separate signalised crossings for cyclists and pedestrians to the new foot and cycle bridge. Cyclists will be returned to the on-carriageway cycle lane on Water End or can use the toucan crossing to access the segregated cycle lane on the north side of the highway.

A new segregated cycle lane will be provided from the Water End junction to York Central. The segregated facility will be separated from the carriageway by a vehicle restraint barrier on the approach to the ECML bridge.

Park Street

The two-way segregated cycle lane will continue along Park Street. The cycle lane has been designed for cyclists to give way to pedestrians at crossing points.

Cinder Street

At the end of Park Street, the inbound cycle lane will merge onto the bus and continue on carriageway through the Station Quarter.

In the outbound (Water End direction) cyclist will remain on carriageway through to Park Street. A cycle lane is provided to direct cycles across to the segregated facility on the north of Park Street.

Hudson Boulevard

Hudson Boulevard provides continuity of the two-way segregated cycle from Park Street to Museum Square. The cycle lane will be segregated from pedestrians by a landscaped verge.

The segregated cycle lane will end at the approaches to Cinder Street, Foundry Way and the entry to Museum Square and will connect into a shared space for pedestrians and cyclists.

NRM and Museum Square

At the NRM, the cycle lane will be continued through the NRM's forecourt on a dedicated cycle lane and will pass through the listed gateposts before Leeman Road Underpass

Leeman Road Tunnel

Cyclists will be relocated from the Marble Arch to a new two-way cycle lane within Leeman Road Underpass. To the east of the tunnel, the route will connect to the existing cycle infrastructure on the south bank of the River Ouse and onto the recently constructed Scarborough Bridge.

Leeman Road and Station Rise

The northern footway of Leeman Road will be widened, and a shared footway and cycle way will be created to link the Leeman Road Underpass with Memorial Gardens.

Leeman Road Link

A two-way segregated cycle lane will be provided between Leeman Road and Park Street and will provide connections with the riverside cycleway accessed from Kingsland Terrace and Jubilee Terrace

Foundry Way

A new on-carriageway cycle route will be created on Foundry Way to provide an alternative route for cyclists around the NRM. The cyclists will join a segregated cycle and footway through the NRM South Yard to Hudson Boulevard where cyclists can access the main arterial cycle lane.

8.7 BUS SERVICES

There is an extensive bus network close to the proposed development providing regular services to and from York Railway Station. The bus services provide access to a wide range of local and regional destinations. There are a number of bus services which stop at the railway station, typically providing buses at an interval of 15 minutes or less during the day from Monday to Friday and at the weekend. These services are complemented by a number of lower frequency services.

Bus frequencies along Leeman Road and Holgate Road are approximately 15 to 20 minutes.

Holgate Road is an important public transport route with a high number of bus services including Routes 1, 5/5A, 22, 23, 24, 44, 59 and 412 using it to access York Railway Station and the city centre. Only the no.10 bus and the no. 2 (Green Line) Park and Ride bus service pass through the site. These stop at the National Railway Museum only

Accessible transport facilities are a key element of the development and will be well served by a choice of connections. This is particularly relevant for people who cannot walk long distances and who tire easily.

8. Access

This is addressed through the layout of the masterplan with places to sit spaced regularly along the primary routes and on key pedestrian desire lines.

This Proposed Development meets the objectives of the OPP by integrating provision of the following public transport elements:

New bus stops will be provided along the new access road, providing three bus stops in each direction. These will be located at intervals to serve, but not limited to, existing and new residents and office / commercial workers.

In addition, a small bus hub will be provided to the south of Museum Square, comprising a bus stop in each direction. This will serve York Railway Station, NRM and office workers. Bus stops will be provided in lay-bys with shelters, seating and timetable information.

A new 3.5 m wide bus lane along Cinder Street to provide priority for public transport vehicles.

8.8 TAXIS AND PRIVATE HIRE

Other than at York Railway Station, there are no taxi or private hire facilities on the York Central site.

A privately-run taxi rank is located immediately outside the entrance to the York Railway Station. The taxi rank is accessible 24-hours per day and used primarily by hackney carriages.

8.8.1 York Railway Station Drop-off

Some users of the proposed development will continue to rely on community transport, taxis or mini-cabs.

The Phase 1 infrastructure will provide a new drop-off facility for up to 12 vehicles to the west of the York Railway Station. This facility can be used by taxis dropping off passengers at the station. This drop-off facility will provide existing and new residents and businesses with direct access the station.

8.8.2 NRM Tourist Road Train

To facilitate the future development of Museum Square, the set-down and pick-up point for the NRM Tourist Train will be relocated from the Museum forecourt.

A new set-down area will be located opposite the entrance

to the Museum close the Coal Drops. Access to and egress from the set-down area will be controlled by new signals sequenced with the one-way working system through the Leeman Road Tunnel.

8.8.3 Coach parking / drop off

Two new coach set-down bays will be provided for the NRM next to Museum Square for groups visiting the Museum.

The design also includes for two coach set-down bays in the rejection loop for use during rail-replacement services with access to the west entrance of the station.

8.9 RAIL SERVICES

York Railway Station is a key hub on the UK's existing rail network, it has fast rail connectivity to London, the North East and Edinburgh alongside a wide range of local, regional and national destinations.

York is located on the East Coast Mainline and provides numerous services per hour to London King's Cross less than 2 hours away.

York also provides high frequency services to regional centres such as Birmingham, Sheffield, Leeds, Manchester and Newcastle. Services also connect to Edinburgh in under 3 hours.

York is a net importer of journeys to work, principally from the East Riding of Yorkshire, and the southernmost districts in North Yorkshire (Selby and Ryedale).

At present accessibility between the site and the Railway Station is poor, with bad visibility and way finding. There is no lift between the site and the concourse and platforms, making the station inaccessible to both disabled users and bicycles in the current format.

Access to the existing west side of the York Railway Station will be improved as part of the Phase 1 Infrastructure RMA through the provision of new signalised crossings of Cinder Street to the station.

The levels and gradients between Leeman Road and the Station will be improved through the raising of ground levels through the Coal Drops. This will provide step free alternative access between the NRM and to the west station entrance.

A new west entrance to the station to provide an alternative

step-free route between the east and west entrances will be submitted in a separate RMA.

8.10 SERVICING AND ACCESS

8.10.1 Existing servicing

York Railway Station has servicing provision to the east of the station, its east and west. The loading bays are located off street or in lay-bays.

The National Railway Museum has a servicing area located to the rear of the building. The loading bay is off-street and does not conflict with vehicle or pedestrian movements.

Servicing access to other uses on the York Central site is provided on the existing road network.

8.10.2 Emergency Vehicles

The primary and secondary access roads have been designed to provide a minimum 3.7m wide access route for emergency vehicles.

8.10.3 Network Rail Sidings at Water End

The new access road will sever the current Network Rail maintenance access to the down-line and up-line of the ECML. This is currently accessed from Water End close the Severus Bridge.

A new vehicle access will be created by a ramp down from the new access road through Millennium Green. A vehicle barrier will be provided to prevent unauthorised access.

8.10.4 Millennium Green Trust Maintenance Access

The new access road will sever the Millennium Greens current maintenance access track from Water End. An alternative maintenance track will be constructed from Garnett Terrace. The existing footway will be replaced with a 3.0m wide access track. This will be formed using a cellular porous plastic paving grid system. The grid system will be partially in-filled with grass over a 1.5m width and the remainder of the track in-filled with gravel filled surface to minimise its visual impact and to integrate it with the wider footway network through Millennium Green.

8.10.5 Network Rail and Northern Power Grid Access

A maintenance access route will be included with the Proposed Development to the existing Network Rail and Northern Power Grid assets to the north east of the NRM.

A splay kerb crossing will be provided at the junction of Leeman Road and Cinder Street. This junction will be a left-turn in and right-turn out only.

The existing Network Rail and LNER station car parking within the Coal Drop which is accessed from Cinder lane will be relocated as part of this Phase 1 Infrastructure RMA. In advance of the construction of the Multi-storey car park facility identified in the OPP temporary car parking will be provided within future development plots with access from Cinder Street and the rejection loop.

8.11 VEHICULAR ACCESS

The Phase 1 Infrastructure will provide access to the York Central development for private vehicles and will offer an alternative to the current routes via Salisbury Terrace/ Kingsland Terrace and Station Avenue. The new access will provide a more direct connection between the strategic highway network and York Central.

The access has been designed for a vehicle speed of 20mph to improve the environment for non-motorised users. The main carriageway has been designed in accordance with principles for Manual for Streets.

8.11.1 Access to existing properties.

Leeman Road, Carlton Road, St Peters Quarter

Access to the properties on Leeman Road to the west of the NRM will be maintained via the Kingsland Terrace and the new Leeman Road Link. Vehicles travelling to/from the city centre will be diverted onto new access road via Park Street.

Network Rails ROC, IECC and ancillary buildings

Throughout the construction of the Proposed Development access will be maintained to the Network Rail operations buildings. The proposals will create an alternative access route to these buildings from Cinder Street and will provide a new connection to Water End.

8 Access

National Railway Museum

Access to the NRM forecourt for inclusive parking, maintenance and servicing will be provided from Leeman Road and Cinder Street.

8.11.2 Park Street

Three central landscaped medians have been included to deviate the road alignment and reduce vehicle speeds. Between the landscaped medians where on-street parking is provided the carriageway is narrowed to 5.0m to further enforce lower traffic speeds.

8.11.3 Leeman Road Tunnel

To facilitate the improvements to the pedestrian and cycle routes through Leeman Road Tunnel and Marble Arch the Leeman Road Tunnel will be reduced to a single carriageway. A one-way working system will be established through the introduction of traffic signals to the east and west of the Tunnel.

The section of Leeman Road to the west of the NRM buildings to the Bull-nose Building will be 'stopped up', to enable the expansion of the NRM across Leeman Road and to bring about quality of life improvements to the residential areas of Leeman Road, and in the Garfield Terrace/ Salisbury Road area.

The section of Leeman Road from the west of the NRM buildings to the Bullnose Building will be 'stopped up', to enable the expansion of the NRM across Leeman Road and to bring about quality of life improvements to the residential areas of Leeman Road, and in the Garfield Terrace/ Salisbury Road area.

The part of Leeman Road to be 'stopped up' has been set out in an application (under Section 247 of the Town and Country Planning Act 1990) submitted to the Secretary of State for Transport on 25 February 2020 (Reference 1400001968 – Y&H/385).

The Leeman Road Tunnel will be reduced to a single carriageway for vehicles with a one-way working system controlled by traffic signals, along with a dedicated cycle route (see above). This will be the primary route to the site from the east. The vehicular access to the site will be retained at the Leeman Road Underpass to the north.

8.11.4 Leeman Road Link

The Link connecting Kingsland Terrace with Park Street will provide the primary alternative route when Leeman Road is stopped up to vehicles.

This road will cross the NRM rail line which will be used infrequently to move NRM exhibitions to and from the museum by rail. The road-rail crossing will be operated manually and under agreement with the local highway authority.

8.11.5 Development Access

The design includes the provision of new access points to the development plots described in the OPP. Three access points will be created on Park Street, three on Cinder Street and one on Leeman Road Link.

The access points indicative only and may be varied as the plot developments come forward in future reserved matters applications.

8.12 CAR PARKING

8.12.1 Existing parking

There are currently approximately 2066 car parking spaces located within or close to the York Central site. The majority of the spaces are situated next to York Railway Station for station users and are commercially operated.

8.12.2 Proposed Parking

On-street car parking

Eight on-street parking spaces will be provided in designated parking bays on Park Street.

Twenty-one car parking spaces will be installed on Foundry Way. Of these four will be access for use following completion of the scheme.

The remaining seventeen spaces will be located to the south of the access control barrier to the NRM and will be brought into use in future phases following the completion of Foundry Way.

Below ground infrastructure will be provided to enable the

future installation of Electric Vehicle (EV) charging points to be delivered in future phases.

NRM Visitor car park

The existing NRM visitor car park accessed from Leeman Road will be modified to facilitate the construction Foundry Way. A new access to the car park will be provided directly from Foundry Way.

8.12.3 Temporary Car Parking

The construction of the Phase 1 Infrastructure RMA will displace the existing car parking facilities to the west of the station. Prior to the development of a multi-storey car park within the York Central site, a number of new temporary car parks will be created on within future development plots. The total number of temporary spaces will not exceed the current number of spaces provided within the development boundary.