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Cambridge South Infrastructure Enhancement Design Principles

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**The Network Rail (Cambridge South Infrastructure Enhancement) Order
CSIE Design Principles – February 2022 - Document INQ-21**

The Network Rail (Cambridge South Infrastructure Enhancement) Order
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CONTENTS

1	INTRODUCTION	1
2	PURPOSE	2
3	PROPOSALS	2
3.1	Identity	3
3.2	Passengers	4
3.3	Community.....	5
3.4	Inclusive	6
3.5	Collaborative	7
3.6	Connected	8
3.7	Contextual.....	9
3.8	Innovative	12
3.9	Sustainable.....	13

1 INTRODUCTION

- 1.1.1 These Design Principles have been developed from those in Appendix A of the Design and Access Statement (DAS) (Doc Ref. NR 15) submitted as part of the Network Rail (NR) application for a Transport and Works Act Order and associated deemed planning permission for the proposed Cambridge South Infrastructure Enhancements (CSIE) Project.
- 1.1.2 The proposals progressed to date are the result of an iterative design process informed by the Strategic Outline Business Case, Project Objectives, the local development plan, technical route development, public and key stakeholder consultation and pre-application meetings with the Greater Cambridge Shared Planning (GCSP) (and other officers for the local planning authorities).
- 1.1.3 The design of the station building, and the landscaping scheme will be required to comply with the Design Principles, as secured through the conditions on the deemed planning consent. Submissions to discharge the relevant conditions will require a Design Compliance Statement to demonstrate how those proposals comply with the Design Principles.

2 PURPOSE

- 2.1.1 The Design Principles have been developed to set out the framework for the detailed design of the station and associated works to help not just deliver the design quality and performance standard of the station and surrounding public realm, but to ensure it is an appropriate response to the context within which it is located.
- 2.1.2 The Design Principles also provide assurance and confidence to stakeholders that the future station will be well designed. They inform the future design of the overall form as well as details of materials, which will be required to be submitted through planning conditions attached to the deemed planning request.

3 PROPOSALS

- 3.1.1 In developing the basis of the illustrative concept for the CSIE project, which is constrained by the adjacent AstraZeneca plot to the East, Cambridgeshire Guided Busway (CGB) overbridge to the North and Hobson's Park to the West, we have developed key Design Principles which are consistent with Network Rail's Principles of Good Design and provide the framework for a contextual design approach which seeks to maximise the overall benefit provided by the proposed Development and demonstrate compatibility with relevant local planning policy frameworks and wider Local Plan.
- 3.1.2 The general basis of these principles is as follows:
 - 1. **Identity** – a station that is developed in a way which provides value for money and a high-quality experience to the user.
 - 2. **Passengers** – meets the needs of passengers in the form and function of the station and improve and simplify journeys.
 - 3. **Community** – balance station infrastructure requirements with forming a new accessible place within the local community and accessing trains and meeting people who arrive by train.
 - 4. **Inclusive** – the design approach will ensure the overall journey experience from forecourt to train is intuitive and accessible to all.
 - 5. **Collaborative** – the proposed Development will continue engage its users and neighbours to support positive outcomes for all.
 - 6. **Connected** – the layout should support the simple and intuitive movement of people, connecting one mode of transport to another, where passenger experience is at the forefront of design considerations.
 - 7. **Contextual** – the station will integrate well into its context, responding to the character and form of Hobson's Park to the east and the wider landscape beyond. To the west, it will provide a well-integrated frontage to the wider CBC campus.
 - 8. **Innovative** – a design that minimises its impact on the environment and that allows for future adaptation and change.
 - 9. **Sustainable** – the station will be designed in a way which considers the whole life cycle of the proposed Development to minimise waste and provide future flexibility.

3.1 Identity

- 3.1.1 An appropriate response to context will ensure that the local character is protected and enhanced. The proposed development should create a scale and form that is appropriate to existing buildings, the public realm and open spaces, which complement the local identity of an area.
- 3.1.2 Proposals are therefore to be developed in a way which includes variety and interest within a coherent, place-responsive design. One which is legible and creates a positive sense of place and identity whilst also responding to the local context and respecting local distinctiveness.
- 3.1.3 The proposed station will respond to the following principles:

No.	Design Principle Name	Design Principle
3.1A	Placemaking	Through its layout and materials, the intent is to provide a sense of place for passengers arriving at the station where the entrance concourse integrates with the public realm and open spaces on its east and west frontages.
3.1B	Be appropriate to its setting and conserve the character and form of the green corridor, Hobson's Park to the west and the open countryside beyond	By careful consideration of the landscape elements, form and materials balance visual legibility of the Station from key destinations, with visual and physical integration into Hobson's Park and the Green Belt.
3.1C	Provide a positive addition to the Cambridge Biomedical Campus (CBC) public realm	The proposed eastern station entrance will have a positive interface with the Cambridge Biomedical Campus (CBC) public realm and respond to the specific landscape character of the area.

3.2 Passengers

- 3.2.1 With customer satisfaction and well-being forming vitally important criteria which encourage people to use rail travel, the proposed footprint includes sufficient and inclusive facilities and public realm.
- 3.2.2 The footprint has been influenced by dynamic passenger modelling to ensure the safe and efficient flow of passengers at peak hours and future growth can be accommodated and through consultation we have been able to better understand the users, accommodate their needs and aspirations to positively influence the proposals.
- 3.2.3 In summary the proposed station will:

No.	Design Principle Name	Design Principle
3.2A	Form a gateway	The design of the Station Entrance and public realm to the east will seamlessly link and integrate with the surrounding context and environmental mitigation of the CBC schemes to form a gateway to the CBC.
3.2B	Car parking	No more than 9 vehicle parking spaces will be provided within the station forecourt (5 spaces for blue badge holders and 4 spaces for station staff and maintenance staff) and space for no more than 6 passenger and taxi drop-off/pick-up will be provided within the station forecourt.
3.2C	Improve passenger experience through good station design	Whilst meeting the future demands of passengers, the passenger experience is to be enhanced by creating a sense of space and light, seamlessly integrating the upper- and lower-level passenger spaces with the external public realm including Hobsons park and the CBC
3.2D	Treat all passengers equally	Consider the experience and environment for users through inclusive design throughout.
3.2E	Maximise benefits to as many people as possible	By undertaking passenger demand and incorporating the results within the proposals, the proposed Development will provide sufficient access which is catered for different users entering, exiting or waiting at the station.
3.2F	Create a new accessible interchange appropriate to the context	The proposed works will provide suitable amenities such as cycle parking, lifts, wayfinding and connected spaces that are intuitive with careful consideration of desire lines both within and beyond the station.

The Network Rail (Cambridge South Infrastructure Enhancement) Order

CSIE Design Principles – February 2022 - Document INQ-21

3.3 Community

3.3.1 The proposed Development will balance local community requirements with infrastructure and functional asset requirements by engaging with key residents, business, community groups and recreational users and site operators within the local area to enable better coordination between public and private resources and improved outcomes for the community.

3.3.2 In summary the proposed station will:

No.	Design Principle Name	Design Principle
3.3A	Community access	To the west, there will be a Station Entrance in the northeast corner of the park interfacing with the existing park access routes to provide safe, and level access straight into the station.
3.3B	Have a positive visual appearance	By creating a considered experience for the user and wider community, specifically from the existing development around it.
3.3C	Consider community opportunities	Design of the station will take into account community feedback to drive a design in keeping with the local context and priorities.
3.3D	Provide space for people	Space will be provided for movement, waiting and meeting of people in varying weather conditions.
3.3E	Minimise impact on neighbours	Maintenance requirements of the works are considered at the earliest design stages and sustainable solutions considered as an intrinsic part of the design.
3.3F	Public Art	The development shall embed public art as an integral part of the proposals as identified through the Council's Public Art Supplementary Planning Document.

3.4 Inclusive

- 3.4.1 The designs should ensure the overall journey experience from forecourt to train is simple and places people at the heart of the design process.
- 3.4.2 In summary the proposed station will be designed in a manner which allows people to use them in an inclusive way and reduces barriers to access and use as well as being:

No.	Design Principle Name	Design Principle
3.4A	Accessible and flexible, public transport interchange	A variety of covered cycle parking areas to both sides of the station to suit various types of bicycles are to be provided, as well as accessible taxi and kiss and ride areas to ensure the station provides a fully accessible and flexible, public transport interchange.
3.4B	Fully accessible	From the entrance through the ground floor accommodation to the platform environment, the design shall be inclusive for users of the station, including ramps/ lifts for evacuation.
3.4C	Provide Space for information	Information about transport options are accessible and easy to find

The Network Rail (Cambridge South Infrastructure Enhancement) Order

CSIE Design Principles – February 2022 - Document INQ-21

3.5 Collaborative

3.5.1 The proposed station area is of interest to multiple stakeholders, therefore it is crucial to seek all parties support both economically and socially through engagement to capture the greatest benefit from the proposed Development for all.

3.5.2 In summary the proposed station will:

No.	Design Principle Name	Design Principle
3.5A	Engage	To ensure the proposals lead to a successful outcome focused on people and places they will continue to be developed around an open dialogue with people, communities and its neighbours.
3.5B	Listen	Network Rail will listen to its future users and shall be developed through a multi-disciplinary collaborative design process such that all features of the proposed Development, maintenance access, its integration with the surroundings, and environmental mitigation are coordinated.
3.5C	Collaborate	Prior to the submission of conditions relating to the detailed design of the station and the landscape proposals Network Rail will present the proposals to the Cambridgeshire Quality Panel and respond to feedback received.
3.5D	Review	Network Rail will continue to engage and consult with key stakeholders such as Cambridge City Council's Access Officer, Cambridge Disability Panel and NR's Built Environment Accessibility Panel.

3.6 Connected

3.6.1 The success of transport infrastructure relies on simplifying journeys, connecting one mode of transport to another, putting passenger experience at the forefront of design considerations. The Transport Assessment has identified that 60% of trips to the railway station expected to be by foot; 24% by cycle; 10% by other public transport; and 5% by taxi or drop off the station has been developed to ensure it is well-connected to enable easy access for all to jobs and services using sustainable modes such as pedestrians, buses, bicycles and the potential future CSET route.

3.6.2 In summary the proposed Development will:

No.	Design Principle Name	Design Principle
3.6A	Create a new accessible interchange	The proposed Development will provide suitable amenities including cycle parking, lifts and way-finding.
3.6B	Integrate with key desire lines	The connectivity of spaces is to be intuitive with careful consideration of desire lines within the station, to local destinations and onward travel.
3.6C	Integrate with future schemes	The proposed Development is to be adaptable to ensure it can integrate with future schemes such as the emerging CSET scheme. The proposed Development will continue to engage with interfacing schemes at the next stage of design.
3.6D	Provide space for interchange	With the Cambridge Guided Busway, pedestrian, drop offs/pick ups and cycle access, as well as the potential CSET scheme space is to be provided to support the movement of people between modes which will all converge on or near the railway station access.
3.6E	Manage interfaces	The junction design on Francis Crick Avenue must be coordinated with the station access to minimise conflict between competing users.
3.6F	Connect modes	Optimise connections with existing path and cycle networks.
3.6G	Cycle and pedestrian access from both east and west	To reduce end to end journey times for all users, entrances with associated cycle parking will be provided to the East and the West.
3.6H	Provide safe and good pedestrian and cycle connections	The proposed Development will provide a direct, surfaced, safe and signposted access route to each side of the station.
3.6J	Ensure direct access to key nodes	The station entrance and access should integrate within the existing urban environment with good access to local communities and services.
3.6K	Minimise motor vehicle access	Motor vehicle access will be limited to access for operational staff, maintenance, emergency vehicles and access for taxis, disabled users and drop-offs/pick-ups.
3.6L	Connect green	Seek opportunities to link to other biodiversity gain strategies being undertaken elsewhere on the CBC site.

3.7 Contextual

- 3.7.1 Proposals are to appropriate to the local character, enhancing the civic and environmental quality of the surrounding area. One of the key challenges in developing the design vision is the need to recognise, respect and respond appropriately to the existing context and emerging CBC whilst developing an integrated station appropriate for the Green Belt and the wider growth within the Southern Fringe area of Cambridge.
- 3.7.2 The existing railway, which the proposed station serves, sits on the eastern boundary of Hobson's Park. An area of grassland and lakes forming part of a green wildlife corridor that runs from Shelford and Trumpington along Hobson's Brook, Vicars Brook and northward to join the River Cam forming an ecological corridor.
- 3.7.3 Therefore whilst the wildlife area adjacent the proposed station forms an important community amenity for those working and living nearby, it is very much part of a bigger picture of strategic Green Belt which aims to protect and enhance the quality and purposes of Green Belt land.
- 3.7.4 This open green area, rich in habitat and wildlife which forms part of the southern gateway to Cambridge, has been key in influencing the station concept.
- 3.7.5 Though site analysis and engagement we have established key masterplan planning requirements which impact the site layout, massing and vision such as permeability and views and embedded these within the design principles:

No.	Design Principle Name	Design Principle
3.7A	Minimise its footprint	In recognition of the site as a 'green corridor' which contributes to the important characteristics of the city and is a key component for providing amenity and biodiversity the CSIE Project within Hobson's Park seeks to minimise landtake, during construction and operation, to allow retention of as much of the existing vegetation, open space and path network as possible.
3.7B	Consider landscape and the environment	Landform change within Hobson's Park would only occur where it is necessary to provide a gentle transition between the existing ground levels of the Park and the finished floor levels of the proposed station building and its associated structures. This includes along the route of the proposed shared pedestrian and cyclist access path across the Park, and the connections to the existing path network to the south-west of the station and the existing maintenance track parallel with the railway.
3.7C		The gradients of landform change along the proposed routes through the Hobson's Park would be suitably gradual to avoid the requirement for formal ramps and steps, given the detrimental effect these would have upon the landscape character and visual amenity of the Park.
3.7D		On a small number of occasions steeper landform slopes may be required in order to minimise the loss of, or harm to existing native tree and shrub vegetation.

The Network Rail (Cambridge South Infrastructure Enhancement) Order

CSIE Design Principles – February 2022 - Document INQ-21

No.	Design Principle Name	Design Principle
3.7E	Integrate well with both the built and natural environment	Located between Cambridge Biomedical Campus, the largest centre of medical research and health science in Europe and the Trumpington residential area, the design of the station needs to maintain and serve as a visual amenity to both sides of this emerging urban context each side of the Green Belt.
3.7F		The layout of the station will seek to integrate and connect with the landscape setting of Hobson's Park and its watercourses by creating a visually and biodiversity enriching design.
3.7G		Integrate swales and attenuation ponds into their setting.
3.7H	Restrict motor vehicular access to the east side only	Given the recreational and wildlife value of the Green Belt/Hobson's Park, provision of motor vehicular access and parking, apart from necessary maintenance, will be located on the east side of the station
3.7I	Integrate with the existing park landscape structure	Promote the station's legibility through reinforcement of the series of 'visual nodes' that already exist through Hobson's Park, Clay Farm and the green corridor.
3.7J		The development's external form, roofscapes and materiality to reflect the semi-naturalised character and landform of the park.
3.7K	Integrate with the proposed CBC landscape masterplan	The station is to provide a visual and physical connection across the railway to accord with the intentions of CBC masterplan principles including minimising built form in the strategic gaps between the CBC buildings to the east of the railway.
3.7L	Be conscious of the operational rail context to provide a safe and maintainable asset	Proposals will not be allowed to affect the operation of the railway or Over Head Line Equipment (OHLE), especially if it required Possessions to undertake this work, which would be both disruptive and expensive.
3.7M	urban greening and green linkages	The prevailing landscape context should inform opportunities for an east-west biodiversity gain through urban greening and green linkages.
3.7N	Form and material	The material palette will be appropriate to its setting acknowledging the materials currently being developed within the neighbouring AstraZeneca Southern Biomedical Campus masterplan and the more natural pallet within Hobson's Park.
3.7O	Biodiverse roof	Network Rail will seek to provide the station with a biodiverse roof with an extensive substrate of varying in depth. The roof will be planted/seeded with an agreed mix of species focused on wildflower planting indigenous to the local area and shall seek to contain no more than a maximum of 25% sedum (green roofs only).
3.7P	Green Fencing	The proposed landscape design will seek to incorporate a living green fence between the AstraZeneca car park and the Cambridge South Station.

The Network Rail (Cambridge South Infrastructure Enhancement) Order

CSIE Design Principles – February 2022 - Document INQ-21

No.	Design Principle Name	Design Principle
3.7Q	Structural Planting – AstraZeneca Building (Hobsons Park)	<p>Provide replacement planting Within Hobson's Park for the structural planting lost on the western boundary of the railway adjacent AstraZeneca. This will include:</p> <ul style="list-style-type: none"> • 20 No. large trees • 44 No. small trees • 2 No. bat boxes • 4 No. bird boxes <p>Network Rail will factor in a 10% net gain to these figures as part of its overall commitment to biodiversity.</p>
3.7R	Birds	Network Rail will include suitable habitat for Corn Buntings within the southern boundary of the proposed exchange land.
3.7S	Landscape enhancements between the new path and the Cambridge Guided Busway	The landscaping scheme shall enhance the area between the new path (Work no. 4) across Hobson's Path (running west to east to the new station building) and the existing Cambridge Guided Busway with, for example, new tree and shrub planting, ponds and wildflower meadows, in order to enhance the environmental value of this part of open space and in doing so provide screening to the guided busway.
3.7T	Western Boundary of the Anne McClaren Building	<p>Provide replacement planting within the western boundary of the Anne McClaren Building. This shall include:</p> <ul style="list-style-type: none"> • 10no. Tilia cordata • 9no. Carpinus betulus • 2no. Juglans nigra • 2no. Zelkova serrata • 2no. Alnus spaettii • 500m2 of 'woodland scrub mix within the land handed back to UoC (AMB) Anne McClaren Building. Species mix: Cornus sanguinea, Corylus avellana, Crataegus monogyna, Euonymus europaeus, Ligustrum vulgare, Prunus spinosa, Rosa canina, Viburnum lantana and Viburnum opulus. • The remaining area is to be seeded with 'Marginal' seed mix Emosgate EM4.
3.7U	Structural Planting – Anne McClaren Building (Hobsons Park)	<p>Provide replacement planting for the structural planting lost on the western boundary of the Anne McClaren Building adjacent to the railway. This will include:</p> <ul style="list-style-type: none"> • 6no. Tilia cordata • 4no. Carpinus betulus • 1no. Juglans nigra • 2no. Zelkova serrata • 400m2 of 'woodland scrub mix within Hobson's Park. Species mix to include: Cornus sanguinea, Corylus avellana, Crataegus monogyna, Euonymus europaeus, Ligustrum vulgare, Prunus spinosa, Rosa canina, Viburnum lantana and Viburnum opulus
3.7V	Maintenance access from Nine Wells Bridge to Cambridge South Station	The access track shall not have a permanent hard surface due to the infrequent nature of its use.

3.8 Innovative

3.8.1 The vision for the Station is that it should form a contemporary, inclusive and functional quality packaged within a suitably scaled architectural envelop that is sustainable throughout its life.

3.8.2 In summary the proposed station will:

No.	Design Principle Name	Design Principle
3.8A	Smart Architecture	The external form, roofscapes and materiality should not only reflect the natural character of Hobson's Park but, shall also provide adequate cover to support passenger comfort and operational dwell times.
3.8B		Seek potential for harvesting sustainable resources such as solar and grey water systems.
3.8C		Ensure the eastern entrance can sustain the level of envisaged multimodal demand.
3.8D	Provide robust operational flexibility	The platform layout allows for flexibility in future services and timings.
3.8E	Provide robust operational flexibility	The station is to provide operational resilience through two station entrances and associated access

3.9 Sustainable

- 3.9.1 Applying “good design” should produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction, matched by an appearance that demonstrates good aesthetics as far as possible.
- 3.9.2 The station architecture, landscape and engineering design is to be as aesthetically sensitive, durable, adaptable and resilient as it can reasonably be.
- 3.9.3 A BREEAM assessment has been undertaken to identify and factor into design targets that impact layout and massing.
- 3.9.4 In summary the proposed station will:

No.	Design Principle Name	Design Principle
3.9A	Habitat	Within this landscape context, the station infrastructure should where feasible, seek to be an integral part of the natural landscape enabling species migration and providing diverse habitats.
3.9B		The station architecture will minimise clutter by seeking dual purposes where possible, as well as opportunities to enrich biodiversity where it can.
3.9C		Design proposals shall prioritise improving connectivity between existing habitats wherever reasonably practicable
3.9D	Net Gain	Network Rail are committed to achieving 10% net gain in biodiversity as part of the proposed Development.
3.9E	Energy	Encourage energy efficiency in the station design.
3.9F		The station will be designed to a BREEAM target rating of excellent.
3.9G	Climate	The station will be designed with the aim of being resilient to climate change and the space to support passenger growth.
3.9H	Sustainable Drainage	SuDS measures are to be identified and incorporated into the design of all external hard surfaces.
3.9I	Resources	The station shall be efficient in its use of resources and multifunctional wherever reasonably practicable. For example, structures will be designed to accommodate multiple functions where it makes sense to do so.
3.9J		The roof geometry should maximise for grey water recycling where possible and balanced with other priorities.
3.9K		The station works are to be designed in a way which considers the whole life cycle of the proposed Development to minimise waste and provide future flexibility.
3.9L		Provide long lasting low maintenance assets.
3.9M	Sustainable and durable material selection	Target Green Guide A or A+ materials where possible.
3.9N		Utilise platform systems which have sustainable benefits over other systems such as reduced levels of embodied carbon and reduced whole life costs of other platform types.

The Network Rail (Cambridge South Infrastructure Enhancement) Order

CSIE Design Principles – February 2022 - Document INQ-21

No.	Design Principle Name	Design Principle
3.9O	Heritage	Proposals will seek to minimise impact on the Hobson's Conduit and its tributaries through integrated landscape drainage solutions and minimising run-off.
3.9P	Lighting	Lighting will be the minimum necessary to provide safe conditions and will be in accordance with relevant guidance set out in the 'Guidance Notes for the Reduction of Obtrusive Light, 2020- GN01/20'.

The Network Rail (Cambridge South Infrastructure Enhancement) Order
CSIE Design Principles – February 2022 - Document INQ-21

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The Network Rail (Cambridge South Infrastructure Enhancement) Order
CSIE Design Principles – February 2022 - Document INQ-21