

CrossRiver*Rail*



10. Visual Amenity and Lighting

Cross River Rail

CHAPTER 10

VISUAL AMENITY AND LIGHTING

JULY 2011

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10 Visual amenity and lighting

10.1 Introduction

This chapter addresses Part B, Section 3.3.4 of the Terms of Reference (ToR), which requires an assessment of potential impacts on the existing visual and landscape amenity of the study corridor and of project lighting.

This chapter provides an assessment of potential beneficial and adverse impacts of the Project's construction and operation on the visual amenity and landscape environment of the study corridor. Measures to maximise or enhance the benefits of the Project on the visual environment and avoid or manage potential impacts are also identified.

Potential visual impacts are dependent on a range of factors such as the sensitivity of the location or the viewer. Locations particularly sensitive to changes to the visual environment include:

- residential dwellings or residential areas, especially those within 1 km of the Project
- places of community importance, such as parks, recreational areas and heritage sites
- tourist destinations
- major and secondary roads.

Roads are only considered as sensitive receptors to the extent that views are altered for vehicle occupants. As a result, visual impacts to road users are generally considered minimal and confined to the duration of time that an impact is in view of a vehicle occupant.

The following sections provide an overview of the assessment process for the Project's potential beneficial and adverse impacts to visual amenity. The sections describe the process and the legislative and policy frameworks that are relevant to visual amenity assessment.

10.1.1 Methodology

The focus of this assessment on the visual and landscape environment is generally confined to the study corridor identified for the EIS. It involved:

- review of relevant strategies, policies and literature relevant to the visual and landscape environment of the study corridor
- assessment and description of the existing visual and landscape environment of the study corridor as a whole and key locations within the study corridor, including:
 - urban design characteristics such as focal points, landmarks, and other features contributing to the visual quality, variety and legibility of the study corridor
 - visual context, including description of major views, view sheds, outlooks and features contributing to the visual amenity of the study corridor
 - urban landscape characteristics and features expected to have values to local, district and regional communities
 - identification of design principles relevant to the assessment of the urban and visual environment of the study corridor

- assessment of the Project's potential beneficial and adverse impacts on visual amenity and landscape character of the study corridor, including
 - consideration of urban design guidelines, principles and treatments proposed for key infrastructure elements of the Project
 - consideration of mitigation measures proposed as part of the reference design to minimise potential visual impacts of the Project
 - analysis of potential changes to the visual environment from the Project and overall visibility of the Project within the visual environment
- identification of mitigation measures to minimise potential impacts of the Project on the visual and landscape environment, and maximise or enhance the visual and landscape benefits of the Project.

10.1.2 Strategic framework

This section provides an overview of strategic plans, policies and strategies relevant to the visual and landscape environment of the study corridor. Further information about plans, policies and strategies is provided in **Chapter 9 Land Use and Tenure** as well as **Appendix F Visual Amenity**.

State planning framework

South East Queensland Regional Plan 2009-2031

At a State level, visual amenity and landscape character is primarily guided through the South East Queensland Regional Plan 2009-2031 (SEQ Regional Plan). The plan is the pre-eminent regional planning document for South East Queensland and provides a strategic framework for the sustainable management of growth and development to 2031 and beyond.

The SEQ Regional Plan identifies a range of regional policies, outcomes, principles and policies and programs, of which those relating to the regional landscape, strong communities and compact settlement are relevant to the visual and landscape environment for the Project. These policies identify the need to provide a visually appealing environment that is safe and accessible. The policies also recognise the importance of promoting the use of design principles that consider the sub-tropical environment, while also retaining elements of character, providing integration with the natural environment and ensuring that open space diversity is maintained.

Development Schemes

The study corridor includes two declared urban development areas (UDAs), at Bowen Hills and Woolloongabba. Development that is subject to ULDA development permitting requirements within these UDAs would be required to adhere to a development scheme that includes an established set of criteria. While the Project would be exempt from assessment, the criteria set out in the development schemes have been considered. The Bowen Hills development scheme and the Woolloongabba Development Scheme outline, for Urban Design and Sustainability, that the form, type and arrangement of buildings, streets and public spaces within the UDAs must demonstrate good urban design and sustainability elements. The development schemes are discussed in **Chapter 9 Land Use and Tenure**. The Project supports the aims of the development schemes relevant to the Bowen Hills and Woolloongabba UDAs by providing high quality urban design and station architecture.

Smart Cities: Rethinking the City Centre

The importance of a visually appealing city is a constant theme throughout the *Smart Cities: Rethinking the City Centre* report. While not the primary focus of the report, visual amenity and good urban design principles are recognised as key factors in the development of a liveable city. The Project as a whole supports these principles, with the principles embedded in the urban design 'system wide strategies' which guide placemaking outcomes for each station precinct (Hassell and AECOM, 2010).

River City Blueprint

The *River City Blueprint* is an outcome of the *Smart Cities: Rethinking the City Centre* report. The River City Blueprint provides consideration of the recommendations contained within the Smart Cities report and alternative strategies.

The River City Blueprint identifies the need to revitalise and rejuvenate the Inner City to provide a more attractive and liveable space for those accessing the area. A key component of this goal that would contribute substantially to the visual amenity of the inner city is the preservation and integration of existing features. The River City Blueprint proposes that the features that lend to the Inner City's character, such as heritage buildings, parks and the Brisbane River, are retained and are incorporated into the design and redevelopment of the area. Although the River City Blueprint was proposed to be released in early 2011, due to the January 2011 Brisbane floods, its release has now been postponed. Further information on the River City Blueprint is provided in **Chapter 9 Land Use and Tenure**.

Local planning framework

At a local level, the visual and landscape environment is managed through a range of planning strategies and policies, including:

- Brisbane City Council's *Our Shared Vision – Living in Brisbane 2026*, which outlines Council's vision for the future of Brisbane and identifies a range of themes, outcomes and targets to achieve the vision
- *Brisbane City Plan 2000* (City Plan), which provides strategic and statutory land use and planning guidance for future development with the Brisbane City Council local government area (LGA). It comprises
 - desired environmental outcomes, which establish the broad, city wide development intentions for achieving the city's strategic direction
 - local plans, which provide detailed guidance on planning and development for specific localities across the city
 - planning codes, which provide guidance on specific aspects of development, eg landscaping code.

Generally, the goals and objectives relevant to the visual and landscape environment identified in local plans, strategies and policies are consistent with the regional planning framework. The local planning framework identifies the importance of a visually appealing city, which responds to the city's sub-tropical climate and which encourages use of public transport, walking and cycling.

Lighting

Outdoor lighting is guided by Australian Standards and local planning and development guidelines.

Australian Standard *AS4282-1997: Control of the Obtrusive Effects of Outdoor Lighting* (AS4282) is the key standard for the management of outdoor lighting. The standard aims to provide a basis for the assessment of the likely effects of developments involving outdoor lighting.

AS4282 details the functional/performance criteria and environmental objectives to be achieved for lighting systems. It is recognised by AS4282 that light spill outside of the property boundary is inevitable. However, the primary objective of a lighting system is to ensure that its intended purpose for illuminating an area is achieved through the use of appropriate design techniques while minimising light spill onto unnecessary areas.

AS4282 identifies that analysis of the surrounding environment should also be undertaken to identify nearby sensitive receptors such as residents, users of transport systems, signalling systems for transport and astronomical observations.

At a local level, guidance on typical lighting levels and requirements is provided by the Light Nuisance Code of the City Plan. The purpose of the code is to control outdoor lighting to maintain local amenity and environmental integrity and ensure that outdoor lighting achieves its desired function while minimising light spill.

The performance criteria identified by the code seeks to ensure that outdoor lighting does not have an adverse impact on any person, activity or fauna because of light emissions, either directly or by reflection.

10.2 Description of environmental values

This section describes the existing landscape character and visual amenity of the study corridor. The description includes an overall impression of the landscape throughout the study corridor, and describes existing landscape features, panoramas as well as views that have, or could be expected to have, value to the community.

10.2.1 Urban landscape, visual context and landscape character

This section provides an overview of the urban landscape, landscape context and visual context of the study corridor.

Urban landscape

The urban landscape of the study corridor is diverse with distinctive landmarks and built features and varying natural features of topography and vegetation.

The study corridor is generally highly urbanised with predominant land uses including residential at differing densities, localised suburban shopping and convenience centres, community facilities, light industry, special purpose centres and Brisbane CBD.

Open space areas, including parks and natural reserves, have valuable landscape qualities and provide opportunities for active and passive recreation, enhancing the sense of place and local identity. Given the highly urban environment of the study corridor, these areas have high community values.

The urban character of the study corridor changes from suburb to suburb in a consistent and coherent pattern, largely due to the dominant presence of typical, sub-tropical, Queensland character housing, topographic features, landscape features such as characteristic tree species and local open spaces. The urban scale generally increases towards the city centre and at centres.

Landscape context

The landscape of the study corridor is generally highlighted by prominent physical landscape elements, including the Kangaroo Point cliffs, the Brisbane River and parklands and gardens.

The study corridor passes through a range of topographical forms and elements, with views towards the city and Mt Coot-tha ranges highly valued by residents and visitors, from various locations across the study corridor. The Kangaroo Point cliffs particularly, are a highly valued visual feature of the inner city, offering views towards the Brisbane CBD and the City Botanic Gardens.

The Brisbane River is a distinctive natural feature, providing visual amenity and visual relief to the surrounding urbanised landscapes. Areas of vegetation exist along the river, particularly adjacent to the City Botanic Gardens. The study corridor also includes numerous local creeks and waterways which add to the visual amenity of local areas.

Vegetation across the study corridor relates to other physical elements such as terrain, water and land use, and is generally concentrated in reserves, parks and other green spaces. Important sites include the City Botanic Gardens, Roma Street Parkland and Wickham Park in the CBD. Vegetation is also a significant element of the urban landscape in some residential areas and streetscapes.

Visual context

The terrain of the study corridor and surrounding areas ranges from hilly and undulating terrain to relatively flat and uniform riparian areas. The visual experience in the study corridor is typical of inner Brisbane, with views of the cityscape, Mt Coot-tha ranges, 'tin and timber' residential uses, green spaces and well established streetscapes. Lower quality visual experiences in the study corridor include areas of light industry, transport infrastructure and other urban utilities.

The visual catchment, which includes those areas from which the study corridor is visible, is likely to be extensive and longer views would not be directly affected by the Project.

10.2.2 Overview of key locations

This section provides an overview of key locations and urban elements within the study corridor, including description of important views, landmarks, vegetation, watercourses and other urban elements. Key locations have been analysed with reference to generic experiences of residents, workers, motorists, pedestrians, cyclists and public transport users and in terms of the visual and physical experience of the existing environment.

Further information on these locations is provided in **Appendix F**.

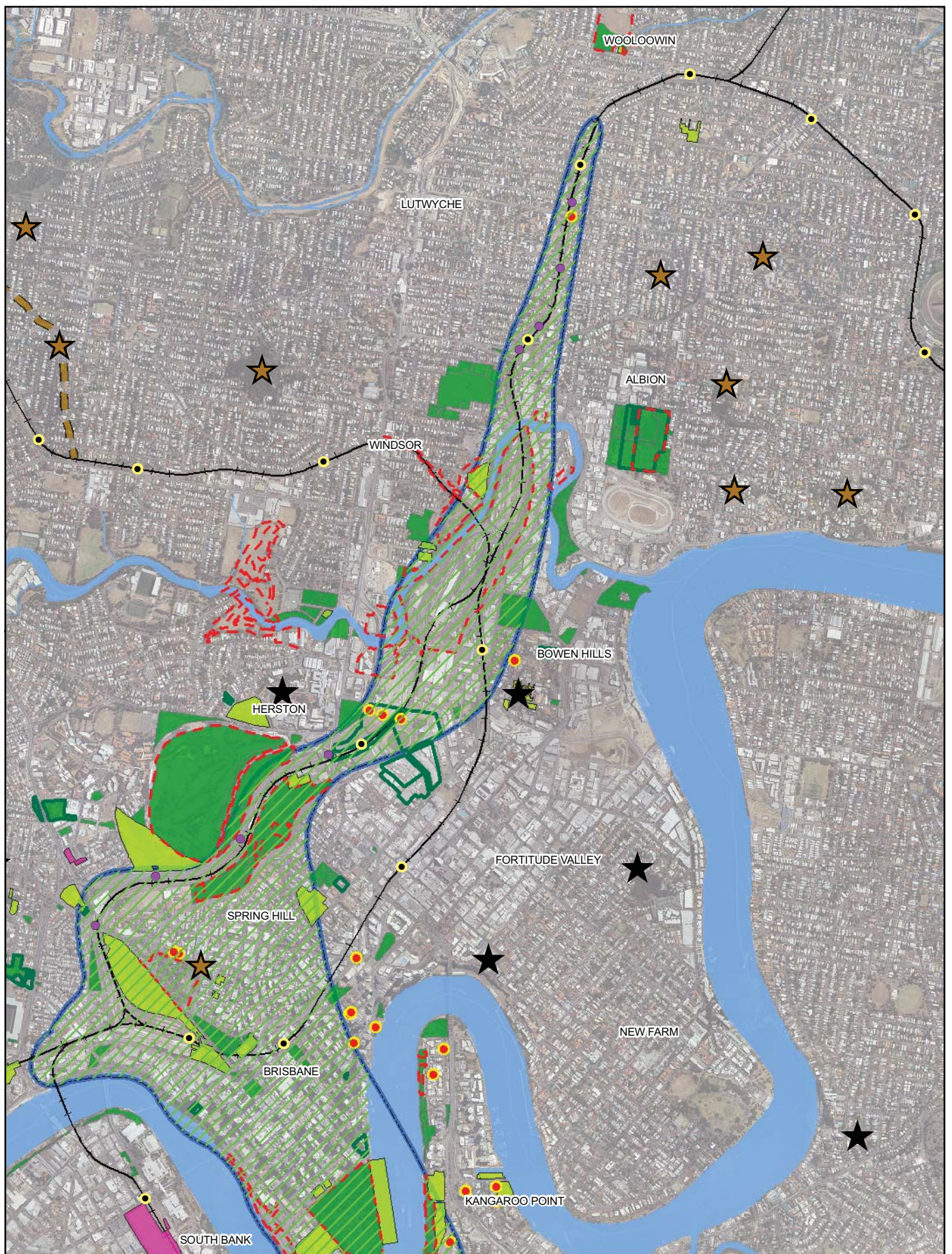
Northern section (Woolloowin to Bowen Hills)

Key elements and characteristics of the visual and landscape environment of this area are shown on **Figure 10-1**. This area is characterised by transitioning from low density residential development in Woolloowin to commercial, rail infrastructure, community facilities and light industry in Albion and Bowen Hills.

Detached residential development is the prominent land use north of the Albion Road overpass, with character housing interspersed with larger multiple unit dwellings and areas of urban activity, such as near the Albion station. South of the overpass, land uses include light industrial areas, the RNA Showgrounds and transport infrastructure. With exception to the buildings within the showgrounds and Breakfast Creek, the area south of the overpass has few visually interesting features.

The landscape amenity in this section of the study corridor is minimal and primarily confined to a small number of locations. Vegetation generally comprises mangroves fringing Breakfast/Enoggera Creek, the fig trees at the RNA Showgrounds and individual fig trees at Woolloowin and Albion. Open spaces are located at Flynn Oval, Perry Park and Bowen Park. A number of streets in Woolloowin provide views to the Brisbane CBD and across the rail corridor to the vegetated hills of Mt Coot-tha to the west.

Amenity varies across this section of the study corridor. Some residents fronting roads adjacent to the railway corridor view high noise barriers, without vegetated screening in some locations, or chain wire fences and views directly onto the rail corridor. Where residences back onto the rail corridor, many have high noise barriers. While this helps to reduce train noise, it also potentially reduces access to light and breezes.



LEGEND

- ★ High Point < 50m AHD
- ★ High Point > 50m AHD
- VPO Individual Tree
- Pedestrian Crossing (Over/Under Pass)
- Station
- Track
- Ridgelines
- Study Corridor
- Drainage Line
- Waterway
- Parks
- Valued Urban Vegetation
- Significant Landscape Trees
- Significant Native Vegetation
- Vegetation Protection Order

CROSS RIVER RAIL ENVIRONMENTAL IMPACT STATEMENT

Figure 10-1
Visual & Landscape Elements
- (Northern Section)

0 250 500 750 1,000 m
1:30,000 at A4

CrossRiverRail

SKM aurecon
CRR JOINT VENTURE

Key elements of the urban environment include the RNA Showgrounds and Bowen Park at O'Connell Terrace as described below.

RNA Showgrounds



Urban context: The RNA Showgrounds is generally an introspective environment, due to its gated entry requirements for the majority of events. This gated environment reinforces the visual perception of an internally focussed precinct. The site is currently poorly connected to the surrounding urban context.

The RNA Showgrounds contain numerous buildings and structures that are listed on the Queensland Heritage Register as the Brisbane Exhibition Grounds. It is the protection of this site over time that has allowed these elements to form unique spatial arrangements and as such the site as a whole is recognised for its cultural heritage significance.

The site is proposed to undergo urban renewal in the near future with the development of a mix of commercial and residential uses. Further information on this redevelopment is provided in **Chapter 9 Land Use and Tenure**.

Landscape context: The terrain of the site is slightly undulating throughout, rising up to a high point at O'Connell Terrace with views to the Brisbane CBD. The site's cultural heritage landscape elements are significant and the grounds contain a number of significant, manicured shade trees scattered throughout the grounds. These are highly manicured and mainly comprising Weeping Fig trees (*Ficus benjamina*).

Visual context: The visual experience within the RNA Showgrounds is largely dominated by the site's heritage elements. A number of features such as the show rings, large buildings and elevated rail line are visually prominent.

Bowen Park, O'Connell Terrace



Urban context: Bowen Park is situated at O'Connell Terrace, near to the Royal Brisbane and Women's Hospital (RBWH), the Inner City Bypass (ICB) and the Clem Jones tunnel and the RNA Showgrounds. Bowen Park is highly valued for its green space contribution to this urbanised area. It contains highly valued mature vegetation, which provides a visual screen from the park to the surrounding urban environment and which can be viewed from the surrounding areas. The park is listed on the Queensland Heritage Register.

Landscape context: The terrain of the park falls from Bowen Bridge Road to the RNA Showgrounds. The vegetation within the park is highly valued and is listed on the Queensland Heritage Register because *"the place is important in demonstrating the principal characteristics of a particular class of cultural places"*.

Visual context: The visual experience within Bowen Park comprises a vegetated landscape dominated by mature trees. Views from the park are generally of the surrounding urban environment, including the RBWH, Bowen Bridge Road and RNA Showgrounds.

Central section (Spring Hill to Fairfield)

This section of the study corridor includes a variety of visual and physical experiences. Key elements and characteristics of the visual and landscape environment of this area are shown on **Figure 10-2**.

The area contains a diverse mix of land uses that are representative of its inner urban environment. The most intense development is situated within the Brisbane CBD, with typical low-medium density residential development primarily located within Spring Hill, Kangaroo Point, Woolloongabba, Dutton Park and Fairfield. Areas of light industrial development are also located in Woolloongabba. Visually prominent land uses include:

- Centenary Pool complex and Victoria Park at Spring Hill
- commercial and residential towers in the Brisbane CBD
- Roma Street Parkland
- City Botanic Gardens in the Brisbane CBD
- Gabba stadium at Woolloongabba
- Boggo Road Urban Village, including the Boggo Road Gaol and the Ecosciences Precinct, at Dutton Park
- South Brisbane Cemetery at Dutton Park.

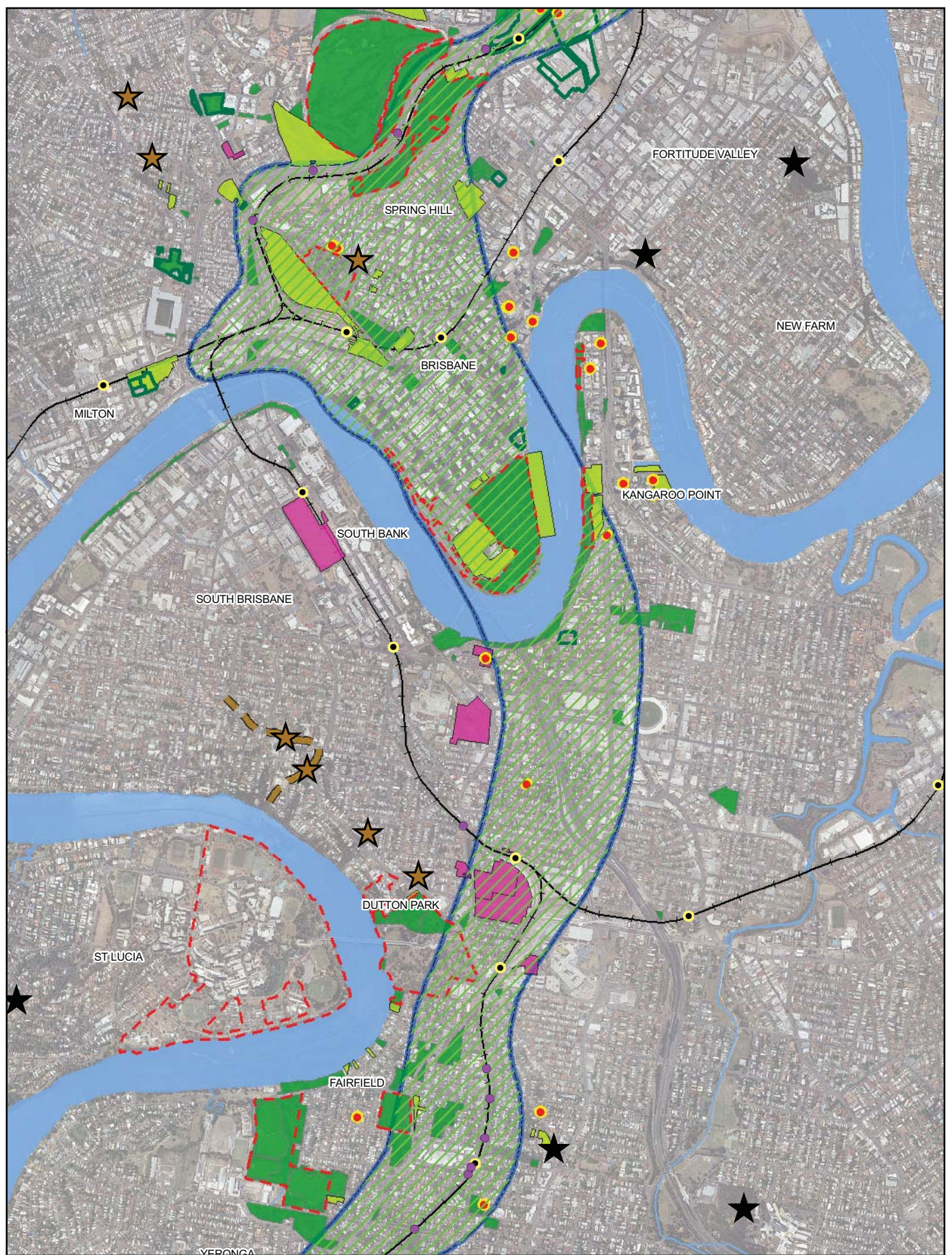
Visual values relate to:

- views of the Brisbane CBD, particularly from Spring Hill and Kangaroo Point cliffs
- distant views of Mt Coot-tha, including from Spring Hill and Dutton Park
- views of the Brisbane River
- views to open space areas, including Victoria Park from Spring Hill, the City Botanic Gardens from Albert Street, Kangaroo Point cliffs from the Brisbane CBD and the Brisbane River from the Brisbane CBD and Dutton Park
- views of character housing complimented by mature vegetation, at Spring Hill, Woolloongabba, Dutton Park and Fairfield.

The landscape amenity varies, depending on proximity to green space.

Access to landscape amenity in Spring Hill is very good, with Victoria Park being a major contributor of green space in the area. Within the CBD, access to green space is adequate, but not extensive, with major green spaces including City Botanic Gardens, Roma Street Parkland and Queens Park. Kangaroo Point cliffs are also valued for their open space, landscape and recreational values. Landscape amenity in Dutton Park is generally high, due to open space areas at Dutton Park, Gair Park and South Brisbane Cemetery. Fairfield also has a number of large parks, including Robinson Park, which were identified during consultation as providing important landscape amenity for local residents.

A number of areas containing significant vegetation in relation to visual, ecological and/or community values are located within this section of the study corridor, including at Roma Street Parkland, Victoria Park, the City Botanic Gardens, Kangaroo Point cliffs, South Brisbane Cemetery and Dutton Park. Boggo Road Urban Village also contains a number of significant landscape trees. A number of trees subject to vegetation protection orders are also scattered throughout this section of the study corridor.



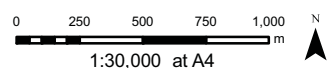
LEGEND

- ★ High Point < 50m AHD
- ★ High Point >50m AHD
- VPO Individual Tree
- Pedestrian Crossing (Over/Under Pass)
- Station
- Track
- Ridgelines
- ▭ Study Corridor
- Drainage Line
- Waterway
- Parks
- Valued Urban Vegetation
- Significant Landscape Trees
- Significant Native Vegetation
- Vegetation Protection Order

CROSS RIVER RAIL ENVIRONMENTAL IMPACT STATEMENT

Figure 10-2

Visual & Landscape Elements - (Central Section)



CrossRiverRail

SKM aurecon
CRR JOINT VENTURE

Amenity is typical of inner urban environments, with views primarily of the urban landscape, broken up by areas of green space which allow for diverse views. Within Spring Hill, the rail corridor is not visible from residences along Gregory Terrace due to topography and vegetative screening in the park. The Brisbane Girls Grammar School is adjacent to the rail corridor and views of the corridor and associated rail infrastructure are possible from the school grounds and buildings. Amenity in the Brisbane CBD and at Woolloongabba is typical of city centre and inner city environments, while amenity in Dutton Park and Fairfield varies, with some residents near to the rail corridor viewing high noise barriers, some of which do not have vegetative screening.

Some of the key elements of the urban environment are described below. They include:

- Victoria Park and Gregory Terrace at Spring Hill
- Roma Street Station and parkland
- Emma Millar Place at Roma Street, in the Brisbane CBD
- Albert Street in the Brisbane CBD
- City Botanic Gardens, in the Brisbane CBD
- Stanley Street at Woolloongabba
- Park Road Station at Woolloongabba
- Boggo Road Urban Village, including Ecosciences Precinct at Dutton Park
- Robinson Park at Fairfield.

Victoria Park, Spring Hill



Urban context: This section of Victoria Park comprises an open space corridor extending from Bowen Bridge Road to Brisbane Girls Grammar School. The corridor is bounded by the Exhibition rail line to the north-west and Gregory Terrace to the south-east.

The park is an important open space corridor in inner Brisbane. It provides valuable formal and informal recreation opportunities and pedestrian and cycle connections to surrounding areas.

Victoria Park makes a valuable contribution to the inner city environment. Visibility of the existing railway corridor from the park environment is limited given its location adjacent to the park's lowest point and screening provided by vegetation in most places.

Landscape context: The terrain of the park drops sharply from Gregory Terrace towards the rail corridor. Vegetation within the park consists of significant plantings of established trees, including Moreton Bay Figs, as well as grassy slopes. Vegetation along the north-west boundary provides an important visual separation from the rail corridor. This vegetation has been identified under Brisbane City Council's Natural Assets Local Law (NALL).

Visual context: The visual experience within Victoria Park is of a sloping vegetated landscape that comprises a mix of grassy slopes and mature and juvenile trees. A range of built features common to open spaces, eg picnic facilities, sporting facilities, pedestrian and cycle paths, are also visible.

The park also offers views to Victoria Park golf course, the RBWH and Mt Coot-tha. Terrain and vegetation within the park limit views from the park to residential properties south of Gregory Terrace.

Gregory Terrace streetscape, Spring Hill



Urban context: The streetscape environment of Gregory Terrace is varied due to the undulating ridgeline and the wide road corridor.

A range of residential, religious and educational uses are located along Gregory Terrace that overlook Victoria Park, the railway corridor, the electricity sub-station near the corner of Gregory Terrace and Bowen Bridge Road, Victoria Park golf course and the RBWH.

The outlook from Gregory Terrace is in contrast to the highly urbanised surroundings, with distant views to the Mt Coot-tha range, with little dominance of built structures.

Landscape context: Gregory Terrace runs south-east to north-west along the top of an undulating ridgeline. It provides a moderately comfortable walking and cycling environment, with the pedestrian environment along the south-eastern side of Gregory Terrace comprising bitumen pavement, with intermittent mature shade trees.

Visual context: Gregory Terrace offers views of open spaces to the north-west as well as views to the Brisbane CBD through typical inner city residential streetscapes. The visual experience travelling along Gregory Terrace is dominated by the open space to the north-west and the low rise residential buildings and heritage style built form to the south-east.

Roma Street Station



Urban context: Roma Street Station is a major hub for local, state and national transport services. Surrounding development includes the railway station and associated rail infrastructure, commercial office accommodation and high density residential uses and the Roma Street Parkland. The station has good access from these surrounding uses.

The station has developed over time to meet its functional and servicing requirements, with this growth resulting in the original Roma Street Station building being surrounded by newer infrastructure and surrounding buildings, making it less of a landmark. Residential areas to the north of the station overlook the railway corridor and station to the south and the Roma Street Parkland to the north.

Landscape context: The landscape amenity within the station is low, largely due to the utilitarian nature of the transport hub and the need to ensure efficient rail operations. Areas surrounding the station are highly urbanised, although landscape amenity is provided by the Roma Street Parkland and smaller green spaces such as Emma Miller Place.

Visual context: Roma Street Station is visually hidden from surrounding streets by the Roma Street Transit Centre to the south and the Roma Street Parkland to the north.

Emma Miller Place, Roma Street



Urban context: Emma Miller Place comprises a green space located between Roma Street, Albert Street and the entrance to the Roma Street Parkland. The park also borders the portals to the Inner Northern Busway and rail corridor.

The park is part of a pedestrian link connecting the Roma Street Station to Queen Street mall, via a series of designed urban spaces. While the edges of the park are cluttered by signage, utilities and street furniture, the open space area contains pleasant grassed areas with established trees.

Landscape context: The park rises gently northward to the border with the underpass for the busway. The vegetation consists of a mix of subtropical tree species common to Brisbane, such as leopard trees, jacarandas, figs, and palms. The majority of the park comprises gently sloping grassy areas.

Visual context: Emma Miller Place offers a confusing visual environment, due to its boundaries serving a number of purposes, including entrances to Roma Street Station and Roma Street Parkland. Within the park itself, the green space provides a well used passive recreation area.

Albert Street, Brisbane CBD



Urban context: The section of Albert Street east of Elizabeth Street comprises a highly activated streetscape, which includes alfresco dining generally located between Elizabeth and Mary streets. The street provides a comfortable pedestrian environment with pavements at a steady grade and shelter from awnings and street trees. However, pedestrian movement along some sections of the street is constrained by alfresco dining.

The built form generally comprises new high rise apartments and offices, with few heritage listed buildings.

The majority of the streetscape between Charlotte and Margaret streets provides uniform pavements, street furniture, street trees and a built form that is pleasant and at a human scale. New developments also bring vitality and variety through uses which activate the street frontage.

Landscape context: The terrain along Albert Street is relatively flat with a minor fall from Elizabeth Street towards the City Botanic Gardens. The street trees (*Flindersia australis*) are of varying heights and condition. Albert Street terminates the entrance to the City Botanic Gardens on Alice Street, with its mature sub-tropical vegetation.

Visual context: The alfresco dining, street trees and awnings generally contain the viewing distance to one block and creating an internal visual experience. East of Margaret Street, the view opens up towards the City Botanic Gardens, with higher awnings, a less cluttered side walk environment and wider pedestrian pavement. This view is nominated in the City Centre Neighbourhood Plan as a street that provides a significant view or vista.

City Botanic Gardens



Urban context: The City Botanic Gardens are an important destination for informal recreation as well as major city events such as concerts and festivals and offer a high level of amenity for residents and visitors.

The City Botanic Gardens are a major open space area within the CBD but also include a range of commercial uses such as café and bike hire. Surrounding development includes major hotels and residential apartments along Alice Street which overlook the gardens, and the Queensland University of Technology and Parliament House which are located at George Street, and border the gardens to the south.

The City Botanic Gardens offer excellent pedestrian and cycle amenity with pathways relatively flat and easy to traverse. The gardens are easily accessible for pedestrians and cyclists from the CBD via Albert, George and Edward streets, as well as South Bank via the Goodwill Bridge.

The gardens provide important access to the Brisbane River along an extensive promenade.

Landscape context: The City Botanic Gardens provide high landscape amenity for residents and visitors and is an important green space within the CBD. It contains significant native vegetation as well as vegetation with high community values.

Visual context: The views from within the City Botanic Gardens are of an extensively vegetated urban green space set against backdrops of the Brisbane CBD skyline, the Brisbane River and QUT Gardens Point.

Stanley Street streetscape



Urban context: Stanley Street is a major connector road from the eastern suburbs to the Brisbane CBD and South Brisbane. The streetscape of Stanley Street between Main Street and the Pacific Motorway, comprises shops, eateries and offices on the southern side and government buildings and transport infrastructure on the northern side. The streetscape environment to the south is separated by a service road and vegetated median, which helps to protect and enhance the pedestrian environment along the shop frontages. Shop awnings and street trees also provide shade and shelter.

Along the northern side, the pedestrian environment comprises a wide footpath immediately adjacent to the busy traffic conditions, with no shade or shelter. Access is provided to the Woolloongabba busway station from the northern side of Stanley Street, with a signalised pedestrian crossing providing a connection to the southern side of the road.

Buildings fronting the southern side of Stanley Street generally comprise two-storey brick buildings, with many representative of the area's history.

Landscape context: This section of Stanley Street rises slightly to the west. Street trees within the median are Tulipwoods (*Harpullia pendula*).

Visual context: The visual experience along Stanley Street differs between the northern and southern sides of the street. The southern side provides a visually rich, human scale environment with active shop frontages and vegetation, while the northern side provides a less visually attractive environment.

The distant view to the southern side is pleasant due to the mix of vegetation and harmonious built form with some stand out character buildings such as the old Woolloongabba Post Office.

Boggo Road Urban Village



Urban context: Boggo Road Urban Village is located at a high point between Annerley Road and the rail corridor. It is a prominent landmark within the local area.

The Boggo Road Urban Village is currently experiencing significant redevelopment that is furthering its prominence within the visual environment. The recently completed Ecosciences Precinct is a large building that is visible from beyond the immediate vicinity.

The Boggo Road Gaol is a State heritage listed building located within the urban village. It is visually prominent to travellers along Annerley Road.

Surrounding the Boggo Road Urban Village are areas of residential development, road and rail corridors and community facilities.

Landscape context: The Boggo Road Urban Village is located towards the summit of a ridgeline that is followed by Gladstone Road. At this location, the terrain slopes downwards from west to east.

Vegetation within the Boggo Road Urban Village is a mix of recently planted street trees and a number of more established trees. As the site is primarily occupied by construction activities, vegetation is generally sparse.

Visual context: The visual experience of the Boggo Road Urban Village includes views of the State heritage listed Boggo Road Gaol, the Ecosciences Precinct and areas set aside for future construction activities. The site is to experience substantial development and as such, the visual environment would change.

Southern section (Yeronga to Salisbury)

Key elements and characteristics of the visual and landscape environment of this area are shown on **Figure 10-3**.

Development is characterised as changing from low density residential development in the north to a mix of light industry and low density residential development in the southern suburbs of Rocklea and Salisbury. Medium density residential development is also located near to the stations. The Animal Research Institute and Queensland Tennis Centre are major land uses in this area.

Areas within this section of the study corridor provide views to the west of Mt Coot-tha range and to the north of the Brisbane CBD. Within Yeronga and Yeerongpilly, views are generally along Fairfield Road and up residential streets comprising character housing and mature vegetation. Other locations along Fairfield Road include views of open space areas, commercial development and noise barriers adjacent to the railway corridor. Residents in these suburbs, primarily have local views of residential properties and typical character residential streetscapes. In some instances, residents located near the rail corridor have views of high noise barriers that are interrupted by areas of vegetative screening. Where the noise barriers are used along the rail corridor, views of the rail corridor and the associated rail infrastructure are constrained.

Within Rocklea, Moorooka and Salisbury, the terrain is relatively flat, with views to surrounding areas constrained. In this area, the visual environment is dominated by views of light industry and transport infrastructure. Views of residential and open space areas are also possible.

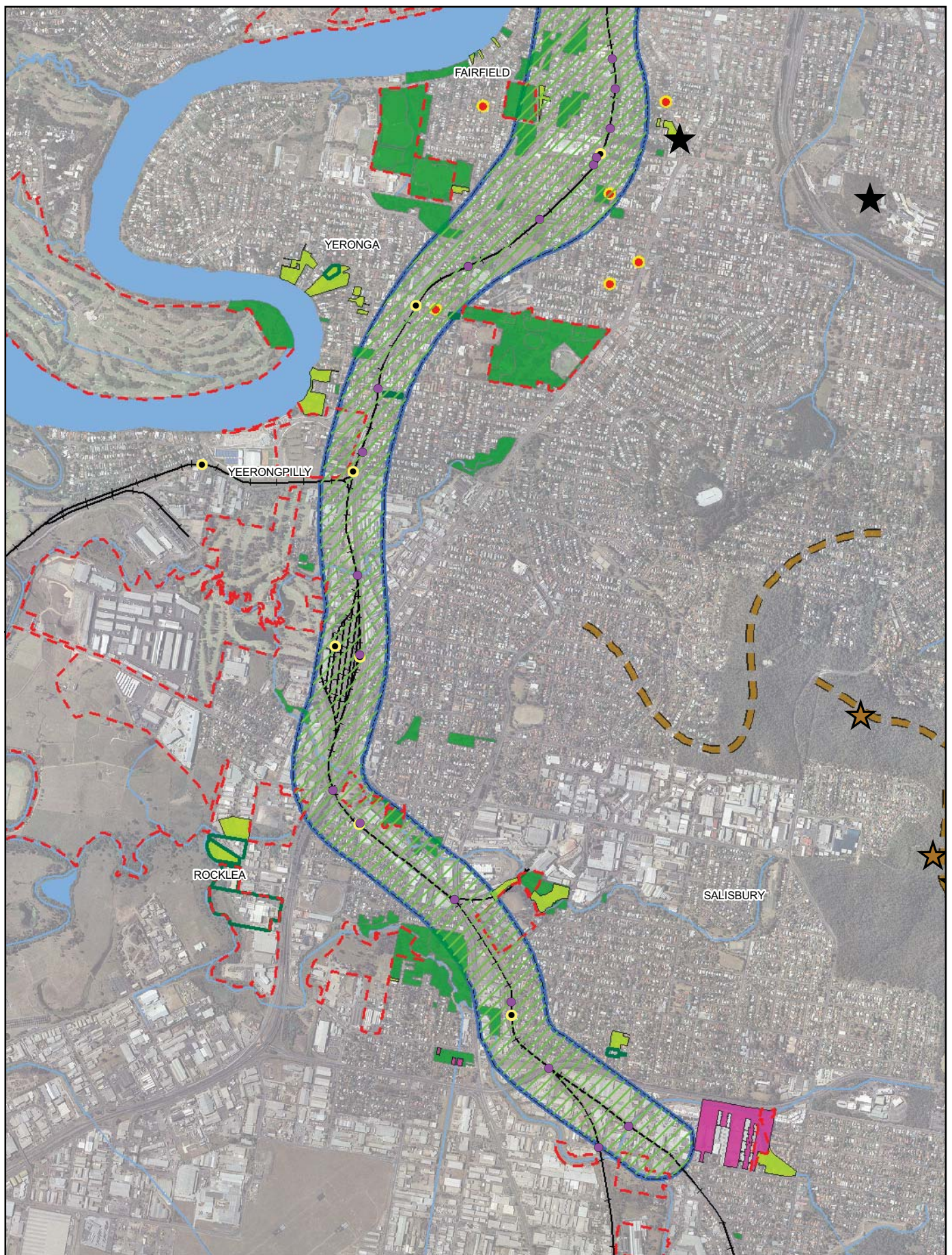
Access to landscape amenity varies across this section of the study corridor. Residents in Yeronga and Yeerongpilly have good access to open space areas including large parks which provide for formal and informal recreation opportunities. The Brisbane Golf Club is a large area of open space near Yeerongpilly Station. While access to this green space is restricted, its presence within the visual environment contributes to the local attractiveness and scenic amenity. These suburbs also contain mature vegetation within parks and along local streets which contribute to the landscape amenity and 'green leafy nature' of the suburbs.

The Animal Research Institute contains mature native and exotic vegetation amongst the low set buildings, which creates an impression of open space at this location. However, this is set to change due to the development proposed for the Yeerongpilly transit oriented development (refer to **Chapter 9 Land Use and Tenure**). Landscape amenity in Moorooka, Rocklea and Salisbury is limited to some areas of open space. The dominant landscape feature of these suburbs comprises the local waterways. These waterways are generally situated at the rear of industrial uses and have a low visual presence within the visual environment.

A number of areas containing significant vegetation in relation to visual, ecological and/or community values are located within this section of the study corridor, at the Animal Research Institute, Yeronga Park, Nyanda State School and at Musgrave Road between the railway corridor and Boundary Road. A fig tree at Belfast Street, Yeronga is also subject to a vegetation protection order.

Key elements of the urban environment in this section of the study corridor are described as follows. They include:

- Yeerongpilly Station
- Stamford Street at Yeerongpilly
- Clapham Rail Yard and Moorooka Station
- Light industrial areas at Rocklea.



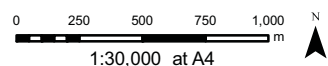
LEGEND

- ★ High Point < 50m AHD
- ★ High Point > 50m AHD
- VPO Individual Tree
- Pedestrian Crossing (Over/Under Pass)
- Station
- Track
- Ridgelines
- Study Corridor
- Drainage Line
- Waterway
- Parks
- Valued Urban Vegetation
- Significant Landscape Trees
- Significant Native Vegetation
- Vegetation Protection Order

CROSS RIVER RAIL ENVIRONMENTAL IMPACT STATEMENT

Figure 10-3

Visual & Landscape Elements - (South Section)



CrossRiverRail

SKM aurecon
CRR JOINT VENTURE

Yeerongpilly Station



Urban context: The urban qualities of the local area are varied and change in character from open space and residential uses to the north and transport infrastructure and light industry to the south. Residential development is generally located east of the rail corridor in this area and comprises typical pre-1946 'timber and tin' character housing, with medium density infill development occurring on larger lot sizes close to the station. Light industrial uses are also located east of the railway corridor. Development west of the rail corridor includes the Animal Research Institute, Queensland Tennis Centre and higher density residential development.

The landscape character of the surrounding area comprises the open space character provided by the Animal Research Institute and Brisbane Golf Club, and residential suburbs with a leafy green character.

Landscape context: The terrain of the area falls gently to the south-south-west, with high points in residential areas to the east. The Brisbane River located to the north-west. Moolabin Creek, which is a tributary of Oxley Creek, is also located in this area.

Vegetation comprises a mix of exotics and native vegetation. Exotic mature trees are mostly contained in the residential area east of the rail corridor, with native vegetation generally contained within the Animal Research Institute.

Visual context: The visual experience of this area is varied. Views to the north are of leafy, green character residential areas, while to the south views are of the light industry and Clapham Rail Yard. Given the terrain of the area, the rail corridor is visible when looking west from many of the residential streets east of the railway corridor.

Residential area, Yeerongpilly



Urban context: Stamford Street is located in the residential area east of the rail corridor and is typical of the residential environment in this area. The street generally contains typical pre-1946 'timber and tin' character housing, with the quality of the streetscape is high due to the character housing and the mature street trees, which provide shade and visual relief.

The pedestrian environment is constrained, with no formalised footpath and the grade of the area making walking moderately challenging.

Landscape context: The terrain in the area falls from a high point north-east of the railway corridor, with streets running perpendicular to the railway corridor falling moderately steeply toward the railway corridor. The residential area contains mature street trees and exotic and indigenous trees are located within private properties.

Visual context: The visual experience of this residential area is representative of an established Brisbane suburb. Visible components include pre-war architecture, narrow streets, mature street trees and front fencing that are open to the street.

Where vegetation is not an obstruction, views to the rail corridor are possible from these streets, as well as views to the mountains beyond the new residential developments located west of the rail corridor.

Clapham Rail Yard and Moorooka Station



Urban context: This view looks north-west over Clapham Rail Yard with Moorooka Station to the right. Views from Ipswich Road between Hamilton Road and Keats Street are unimpeded to the rail yard. The rail yard is largely unscreened from Ipswich Road.

The rail yard is large. Surrounding development comprises light industry to the west and residential uses to the east, beyond commercial development and car yards adjacent to Ipswich Road.

The urban qualities are utilitarian in nature due to the heavily trafficked Ipswich Road and the functional requirements of the rail yard. Moorooka Station is of low visual quality. Businesses along Ipswich Road include car yards, commercial and light industry, and provide for a limited urban environment. Activity along Ipswich Road at this location is primarily confined to a few functions that are undertaken during day light hours. At night time this area is relatively unoccupied resulting in the perception of safety issues, especially around the station entrance.

Landscape context: The terrain surrounding the rail yard is relatively flat. While this allows for a relatively comfortable pedestrian environment along Ipswich Road, pedestrian amenity is compromised by high traffic volumes, narrow pathways and unscreened views of the rail yard.

Moolabin Creek, which is a tributary of Oxley Creek, is located north of Clapham Rail Yard. Minimal screening of the rail yard from Ipswich Road is provided. The light industrial development limits the type and quality of vegetation.

Visual context: The visual experience of this area consists primarily of views of the Clapham Rail Yard, including heavy freight trains and associated infrastructure. The experience along Ipswich Road includes views of car yards, light industry and commercial retailers. Buildings are generally older with the quality of frontages generally low due mainly to the utilitarian nature and the age of these developments. The visual experience along Fairfield Road around this area primarily includes views of light industry and the Brisbane Golf Club.

Light industrial area, Rocklea



Urban context: This is typical of the light industry area located adjacent to Salisbury Station at Rocklea. The utilitarian approach to the organisation of space is typical of the light industry in the area.

The variety of the urban space in this area is limited, largely due to the nature of businesses and minimal human interaction within the street. The scale and bulk of buildings is generally alienating for pedestrians.

Landscape context: The terrain in this area is relatively flat and approaching the low lying floodable land usually associated with light industry. Some vegetative screening of the rail corridor is provided, although minimal screening of the light industry by vegetation is provided.

Visual context: The visual experience consists primarily of views of industrial buildings and of a utilitarian environment with presentation to the public a low requirement.

10.2.3 Lighting

Existing lighting conditions in the study corridor are consistent with its inner city and inner suburban location, with many locations near commercial areas and major road corridors, relatively well-illuminated. Residential and open space areas are lit to the extent required to allow safe navigation and personal safety.

This section provides an overview of existing lighting conditions in residential neighbourhoods and other locations within the study corridor.

Lighting at public transport facilities

The study corridor contains a number of locations used for the storage and maintenance of public transport vehicles, including Mayne Rail Yard, Bowen Hills bus depot, and Clapham Rail Yard. These areas are well-illuminated to allow night-time maintenance and operations and ensure safety and security for workers and property. Lighting at these sites is generally elevated to allow the entire site to be appropriately illuminated. While some light spill from these facilities is likely, they are generally located within industrial areas or away from sensitive receptors.

The study corridor also includes numerous bus and rail stations, which are relatively well-lit to ensure the safety and security of commuters, workers and property. This includes both the station building and the immediate surrounds, and facilities such as car parks, drop-off and pick-up locations and pedestrian access. While light sources are generally focused on target areas, some light spill into nearby areas, including sensitive receptors, may be experienced at some stations.

Road corridor lighting

Roads across the study corridor are generally well-illuminated to provide a safe operating environment for road users. Varying levels of luminance are provided for roads within the study corridor, depending on the function and hierarchy of the road. Major arterial roads are generally the most visually prominent within the night time environment, while local streets generally provide lower levels of illumination.

Lighting for road corridors is typically located at a suitable height to provide clearance for high vehicles. While these light sources are primarily focused over the roadway, light spill to surrounding properties is common. A range of measures are used to limit light spill from major roads on nearby properties and particularly sensitive receptors. These include the use of light shields and in some instances vegetation and visual barriers.

Lighting from vehicles is also an existing source of light pollution for nearby residents.

Commercial precinct lighting

The study corridor includes a number of commercial precincts which contribute to the luminance of local areas.

Within the Brisbane CBD, commercial office buildings, retail and entertainment spaces and residential uses contribute to the overall illumination of the CBD. Light pollution within this location is primarily generated by a mix of street lighting, feature lighting, vehicle lighting and unshielded internal lighting, such as within residential or commercial towers.

The Woolloongabba commercial precinct, including the Goprint and Land Centre facilities, contribute to the illumination of the Woolloongabba area. Commercial developments within this area are generally most active during normal business hours, with limited requirement for night-time lighting. However, there are some entertainment properties that operate at night-time such as restaurants and hotels.

Street lighting along Stanley Street, Ipswich Road and Logan Road and security lighting within the Goprint and Land Centre facilities and the car dealerships along Ipswich Road are generally the most prominent light sources within this area. A number of entertainment and retail properties with night time operations are located on Stanley Street and Logan Road and lighting is provided to ensure the adequate operation of these businesses. This precinct also receives light spill from the adjacent Pacific Motorway and Gabba stadium during night time events.

A small commercial precinct is located along Fairfield Road near Yeronga Station. The precinct contains a mix of local service businesses and some small entertainment businesses. Lighting is generally required for security and to ensure the safe navigation of car parks. As commercial uses within the centre generally face towards the car park and Fairfield Road, light trespass onto adjacent sensitive receptors is limited.

Lighting at major facilities

The study corridor includes a number of major facilities, including stadiums, the RNA Showgrounds and hospitals that contribute to the illumination of the study corridor.

The Gabba stadium and RNA Showgrounds provide a source of light during night-time events. Event lighting at these venues is situated at an elevated location above the height of stands and associated buildings, which results in a significant sky glow during night-time events.

The RBWH, Mater Hospital and the PA Hospital are located near to or partially within the study corridor. Due to the size and 24-hour operation of these facilities they are visually prominent at night-time. While lighting is generally focussed on target areas, light spill onto nearby properties is experienced in some locations. These facilities generate some sky glow, particularly at the RBWH and the Mater Hospital due to their requirements to provide lighting for helicopters that contributes to the overall sky glow of the Brisbane urban area.

Industrial precinct lighting

A number of industrial areas are located within the study corridor. While some night-time activities are undertaken in these areas, these areas generally have limited activity outside of normal business hours, with night lighting required for passive security measures.

Security lighting within these precincts acts as a deterrent to crime by illuminating potential points of interest and improving visibility for security personnel or passing motorists. As this lighting is only required to illuminate a particular area and is not required to undertake operational activities, a low watt lighting system is typically used that has minimal light spill implications for surrounding properties.

Lighting at major construction sites

A range of major projects are currently being constructed within or near to the study corridor, including construction of inner city buildings and major transport projects. While surface works are generally undertaken during day light hours, lighting is required for some external night-time construction activities as well as for safety and security of workers and property. Some light trespass and glare occurs from construction work sites on adjoining land uses.

10.2.4 Summary

The visual and landscape context of the study corridor reflects its inner city and inner suburban location. The visual landscape is extensively developed and contains numerous existing light sources. Publicly accessible areas throughout the study corridor generally receive light from unnatural sources either directly or indirectly during night time hours.

Views throughout the corridor are of a developed landscape of varying intensities that are disrupted by views of green space and vegetated streetscapes. Overall, the study corridor provides for a variety of differing views that are generally typical of its location within an urban environment.

Due to this variety of views and that the study corridor can not be viewed in its entirety, it is important to recognise the visual environment within a local context.

Within the inner city locations such as the Brisbane CBD and Spring Hill, views of high density residential and commercial development are common. Beyond these locations, views of high density developments decline and are replaced primarily by low-density residential neighbourhoods and areas of light industry. These areas are generally offset by views of small retail and service centres and open space. Throughout the study corridor views of transport infrastructure are common. Road and rail infrastructure, including noise barriers, are prominent within most views within the study corridor.

Views from locations across the study corridor of the Brisbane CBD cityscape and of features such as the Mt Coot-tha range are highly valued by residents and visitors.

10.3 Potential impacts and mitigation

This section provides an overview of the design guidelines that were incorporated into the reference design. It provides an assessment of the potential visibility of the Project and the impact it may have on views within the study corridor.

This section provides an assessment of potential changes to the landscape amenity and the visual environment within the study corridor due to the construction and operation of the Project. Mitigation measures are also identified to minimise potential adverse visual impacts and maximise or enhance beneficial impacts of the Project on the existing visual environment.

Landscape amenity refers to the composition of the natural, human, living and transitory features and how they define the visual environment. Changes to visual environment, either through the removal or addition of features, is likely to result in changes to the overall landscape amenity.

Visual assessment provides an overview of the potential for the removal or addition of features to be visible by potential viewers. Visual amenity is linked to landscape amenity as it provides an overview of the potential visibility of changes to the visual environment.

10.3.1 Design guidelines

This section provides an overview of the design guidelines that were incorporated into the reference design and provides visual amenity goals and objectives.

Vision and outcomes

A vision and associated city building outcomes were identified for each of the station locations. This informed key elements of the reference design such as the location of station entries, station design and essential precinct and streetscape works at each station.

The vision and city building outcomes sought for the Project are outlined in **Table 10-1**.

Table 10-1 Project goals and objectives

Vision	City building outcomes
Ekka Station Realise Ekka Station as a fully operational station and catalyse the planned regeneration of Bowen Hills and RNA Showgrounds.	• support redevelopment of RNA Showgrounds and broader Bowen Hills UDA • preserve planned intent for all passenger lines to pass through the Bowen Hills area • facilitate ongoing growth and development of major health and knowledge precinct focused on the RBWH • reinforce role and function of O'Connell Terrace as an important people street and inner city east/west connection • provide critical missing link in northern cycle network • reinforce major public pedestrian route through the RNA from the Fortitude Valley.
Roma Street Station South East Queensland's primary transport interchange. The Brisbane CBD's western gateway and future expansion zone connecting the hillside to the river and the city's great people streets.	• establish a regional transport interchange for all local, city wide, regional and interstate public transport • reinforce the Albert Street green spine between the City Botanic Gardens and Roma Street Parkland • reinforce the western gateway to Brisbane CBD and improve urban quality • reconnect the river to Spring Hill and the tower mill • protect long term renewal and Brisbane CBD expansion opportunities associated with the Roma Street rail yard and the Transit Centre.
Albert Street Station A truly central station and forecourt providing a focus and identity for southern Brisbane CBD as an active, mixed-use quarter on the park.	• establish a truly central station that addresses the public transport shortage in the southern Brisbane CBD • promote Albert Street as a principal people street and green link between the Roma Street Parkland and the City Botanic Gardens • create new public space at the heart of Brisbane CBD south in the station forecourts and widened footpaths. • promote a more legible structure for Brisbane CBD with improved connections • facilitate the ongoing renewal and intensification of Brisbane CBD and opportunity sites
Gabba Station A mixed-use heart for Woolloongabba that supports a new inner city community and a vibrant public space that enhances "The Gabba" 'game day' experience.	• support redevelopment of Woolloongabba UDA, Woolloongabba Central and Kangaroo Point south • establish Woolloongabba as a key southern intermodal interchange • support a vibrant sports and events precinct • enable improved pedestrian access and walkability • reinforce role and function of Stanley Street as an important people street and major connection from the southern suburbs to the CBD
Boggo Road Station A world class health, science and knowledge cluster and mixed-use TOD connecting Boggo Road Urban Village, the University of Queensland and PA Hospital.	• facilitate development of a major health, science and knowledge precinct • create new connections between communities and activities currently separated by rail and road infrastructure • promote convenient and rapid rail/rail and rail/bus interchange • encourage intensification of land uses in close proximity to station to take advantage of city and river views.
Yeerongpilly Station Revitalise Yeerongpilly Station providing improved transport amenity to underpin the development of a leading transit orientated development that straddles the rail line and Fairfield Road.	• support the development of a significant transit oriented development hub • supporting a tunnel portal location which preserves the urban fabric of the inner city • providing convenient and direct access to Queensland's premier tennis precinct • creating a stronger, mixed use focus for the community.

Source: Hassell and AECOM, 2010

Visual and landscape goals and objectives

Goals and objectives have also been identified for the design of the Project stations, including:

- responding to the unique character of Brisbane
- providing a clear architectural identity for Cross River Rail
- promoting passenger experience and comfort
- being functional buildings that promote efficiency of passenger movement
- seamlessly integrating with the existing context and future development plans
- clearly identifying Cross River Rail within the urban context
- incorporating a high level of standardisation in planning and built elements to facilitate expedient construction
- incorporating high quality and durable materials selected for life cycle performance, maintenance, sustainability performance and cost.

More specifically, a range of key design principles were identified to guide the design of project infrastructure. Those relevant to the visual and landscape environment include:

- providing new connections and reinforcing existing connections for pedestrians, cyclists and other modes of public transport
- providing sufficient capacity to ensure distribution of pedestrians into the community at peak times within desirable levels of service
- facilitating safety in design, particularly to bus stops and waiting areas
- providing shade and shelter at entries and key pedestrian collection points
- providing opportunity for retail or other activation at ground level in the vicinity of the station entry to improve passenger service and comfort and passive surveillance
- protecting and enhancing view lines to reinforce the character of existing streets and buildings
- minimising the impact of station services and project infrastructure on the visual environment
- delivering enhanced landscape, lighting, seating and other public amenity around station entry points
- using durable and distinctive materials to increase sense of place and differentiate station locations.

Additional principles identified for this visual and landscape assessment relevant to the construction and operation of the Project include:

- ensuring non-station project infrastructure, eg bridges, flyovers, portals, ventilation and emergency access building and noise barriers, is integrated with the environment to the extent possible, and in a consistent manner through urban design and landscape treatments
- providing inclusive public spaces supporting neighbourhood identity through design
- integrate, to the extent practicable, existing landscape elements with the project infrastructure
- respecting and where practicable, protecting critical views and vistas, and minimising and mitigating visual impacts of the Project, including to the Brisbane CBD, City Botanic Gardens, and Mt Coot-tha ranges
- strengthening green space values of the existing network of open space and rehabilitating Project construction areas in accordance with the environmental management plans and good design practice

- where possible and practicable, promoting water wise sub-tropical urban design and landscape treatments, including environmental treatments for water quality management and habitat enhancement, for both project infrastructure and public open spaces
- applying crime prevention through environmental design (CPTED) principles through the design process
- to the extent reasonable and practicable, applying sustainable design principles through the design process.

10.3.2 Potential landscape and physical amenity impacts

The Project may result in positive and negative changes to the visual and landscape environment from surface construction works and surface infrastructure. Changes to the visual and landscape environment from construction works would be temporary in nature, while those related to project infrastructure would be permanent in nature.

During construction, impact on the visual environment generally relates to construction worksites, including associated screening and noise barriers. In the longer term, key project infrastructure that would impact on the visual and physical environment includes:

- surface infrastructure associated with the underground stations at Roma Street, Albert Street, Woolloongabba and Boggo Road
- surface stations at the RNA Showgrounds and Yeerongpilly
- associated infrastructure such as the ventilation and emergency services building at Fairfield
- viaduct structures at Mayne Rail Yard and Moorooka Station
- bridges at Moolabin Creek, Clapham Rail Yard and Muriel Avenue
- noise barriers at Yeerongpilly, Salisbury and Rocklea
- feeder stations at Bowen Hills, Spring Hill and Yeerongpilly
- the tunnel portals at Victoria Park and Yeerongpilly and surface track works north of Victoria Park and south of Yeerongpilly.

The following provides an assessment of potential impacts of the Project on the visual and physical environment.

Northern section (Woolloowin to Bowen Hills)

Potential visual impacts of the Project at the Mayne Rail Yard would generally be due to the viaduct structure, located adjacent to and at a similar height to the ICB. The structure itself would be relatively utilitarian in nature which would be in keeping with the visual environment of this location.

The Ekka Station would replace the existing Exhibition Station, and would take the form of a new raised platform with two station entries. The first entry would be to O'Connell Terrace and would provide an anchor point for future development within the UDA core at Bowen Hill, the O'Connell Terrace precinct, and the RNA redevelopment itself. The second station entry is positioned to integrate with the north-south pedestrian spine of the RNA master plan. Both station entries are prominently located within an overall development framework and as such are designed to be visible and identifiable for patrons.

The station entries would improve connectivity to existing destinations such as the RBWH. However, the Project and the RNA Showgrounds redevelopment would change the visual and landscape character of the RNA Showgrounds, including through the removal of some State Heritage listed buildings and structures and landscape elements.

At O'Connell Terrace, raising of the roadway would change the existing visual experience of O'Connell Terrace, which currently has a relatively even fall from the corner of Hamilton Place to Bowen Bridge Road. This would also impact on the existing State Heritage listed buildings of the RNA Showgrounds adjacent to O'Connell Terrace. However, the relevant affected buildings have been approved for removal as part of the RNA Showgrounds redevelopment and may not be present once the construction of Cross River Rail commences.

A summary of the potential changes due to the Project's construction and operation in this section of the study corridor is provided in **Table 10-2**.

Table 10-2 Potential impacts on the landscape and physical environment – Northern section

Project infrastructure	Potential impacts on the landscape and physical environment
Engineering infrastructure at Mayne Rail Yard, including: • viaduct and screening • new and slewed track • feeder stations.	Landscape amenity • The feeder stations would impact on the existing planted landscape batters between Lanham Street and the ICB on ramp to the Clem Jones tunnel. Visual environment • The feeder station contains plant which would be utilitarian in nature. In some instances, these structures would be visible from the Clem Jones tunnel entry and exit as well as the ICB overpasses. The Project would not change the general nature of the visual environment.
Re-grading of O'Connell Terrace.	Landscape amenity • Potential impact on some of the new plantings facing the street above the portal of Clem Jones tunnel. Landmarks and legibility • Re-grading of O'Connell Terrace would impact on the existing heritage listed buildings within the RNA adjacent to O'Connell Terrace. These buildings are approved for redevelopment through the RNA Master Plan and may not be present once the construction of Cross River Rail commences. Visual environment • Potential change to the visual appearance of this relatively evenly graded streetscape.
New station and surface works at the RNA Showgrounds, including station entries at O'Connell Terrace frontage of the RNA (entry 1) and within RNA redevelopment (entry 2). Engineering infrastructure required for the station works include a mix of platform structure on retained soil systems (RSS) walls or piers.	Landscape amenity • The Project would impact on four of the seven State Heritage listed fig trees (<i>Ficus benjamina</i>) within Show Ring No. 2 and a section of the oval itself due to the construction of the station viaduct. Residential amenity • At present there are no local residents within the immediate vicinity of the Project in this location. Landmarks and legibility • the Project would impact on various State Heritage listed items, including: • the pedestrian tunnel • railway bridge/viaduct • trees/plantings in Show Ring No. 2 • rail embankment.

Project infrastructure	Potential impacts on the landscape and physical environment
	Visual environment Changes to the visual environment would occur due to the removal of key elements from Show Ring No. 2 and changes to the shape of the oval. In the event that redevelopment works for the RNA Showgrounds have not been undertaken, the Project would also impact on the Dairy Cattle Pavilion, Pig and Dairy Goat Pavilion and Deer Pavilion, which would change the visual nature of the O'Connell Terrace streetscape. Generally, the station would be designed to be visually appealing and would be consistent with the proposed redevelopment of the RNA Showgrounds.
Construction related works in Mayne Rail Yard, including: - establishment of worksites - construction activities.	Construction works within Mayne Rail Yard are not expected to impact on the landscape or visual environment of the yards.
Construction related works, including: - worksites at O'Connell Terrace and RNA Showgrounds - construction activities at O'Connell Terrace and RNA Showgrounds - surface construction works The impact from construction activities would be temporary.	Visual environment Construction activities would change the visual environment for visitors to the RNA Showgrounds and along O'Connell Terrace. These changes would be consistent with the changes that would be experienced as a result of the RNA Showgrounds redevelopment.

Central section (Spring Hill to Fairfield)

This section provides an overview of potential changes to the visual and landscape environment between Spring Hill and Fairfield. Due to the area covered by this section, it is presented in two sections being north and south of the Brisbane River.

North of the Brisbane River (Spring Hill and Brisbane CBD)

The main construction impact within Victoria Park would be due to the major worksite and access road. Existing vegetation in the park would be impacted and the existing buildings associated with the Brisbane City Council facility would be removed. The main permanent impact on visual environment of this area is the height and bulk of the feeder station infrastructure that would be situated in the lower section of Victoria Park. A small section of Victoria Park along the boundary with the rail corridor would be permanently lost.

The main benefits of the northern portal in this location is that it would be situated in a low lying area with only minimal visual impact on park users and residents situated on Gregory Terrace. The portal and associated infrastructure would also be situated immediately adjacent to existing rail infrastructure which is currently viewed from Victoria Park south, York's Hollow, part of the RBWH, the Victoria Park golf club and transitory views from the ICB. In this respect the Project delivers minimal visual change to what is already viewed as a rail corridor.

The main visual and landscape benefits of the Project at Roma Street Station would be improved amenity in the immediate vicinity of the new station, associated with the station entrance and plaza.

The temporary use of land near the entrance to Roma Street Parkland at Roma Street for a construction worksite would impact on the visual environment in this location. Part of this worksite would occupy the north-west portion of Emma Miller Place and would become the permanent location of the new station entry (shown in **Figure 10-4**).

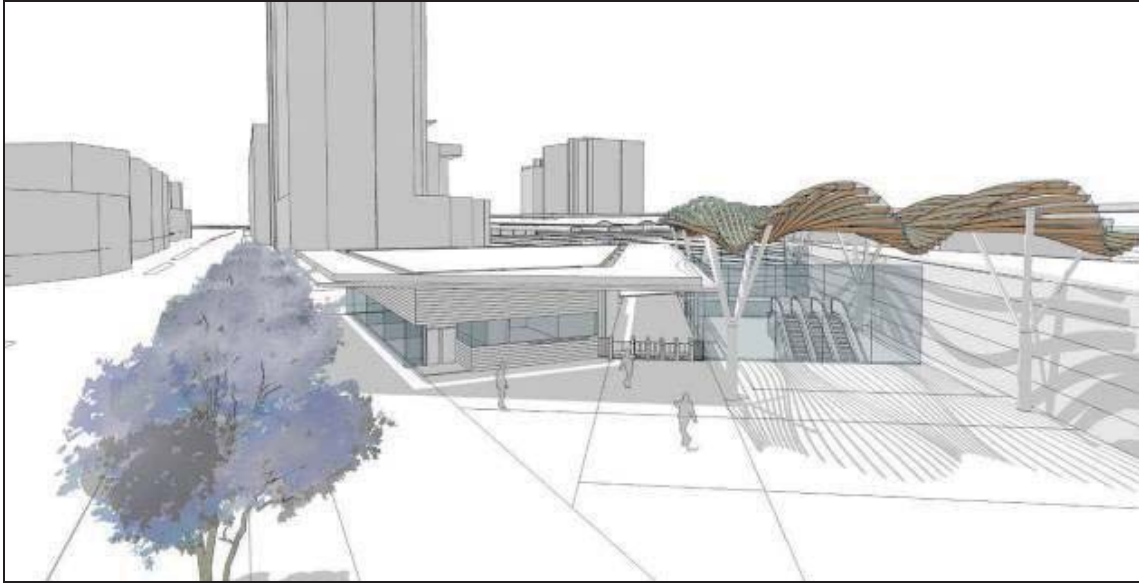


Figure 10-4 Representative view of the station access from Roma Street

A construction support site would be located within the existing visitor car park for Roma Street Parkland. With the exception of the north-west apartment tower at Roma Street Parkland, there would be minimal visual impact of this site due to its location in a low lying section of the parkland and proximity to the rail corridor.

The primary entry for the Albert Street Station would be provided near the corner of Albert and Mary streets (see **Figure 10-5**). A secondary entrance would also be provided near the corner of Albert and Alice streets, while an entry would be provided adjacent to the City Botanic Gardens in Alice Street.



Figure 10-5 Representative view of Albert Street station northern entrance

In the short term, the main visual impact at this location would be due to the removal of the Royal on the Park hotel and the shops and restaurants located on the northern side of Albert Street, between Charlotte and Mary streets and the subsequent use of these sites for construction. In the longer term, these sites would be redeveloped for the station entries.

Currently, Albert Street, between Mary and Alice streets, lacks active street life. The development of the station in this location, along with the associated streetscape improvements, would act as a catalyst for the rejuvenation of the entire street and provide a positive impact on the amenity of this location.

While outside the scope of the Project, the future redevelopment of the Royal on the Park hotel site post-construction would provide opportunities to create a more active street frontage and increased variety of uses in this part of Albert and Alice streets.

A summary of the potential changes to the visual and landscape environment due to the Project's construction and operation in this section of the study corridor is provided in **Table 10-3**.

Table 10-3 Potential impacts on the landscape and physical environment – Spring Hill and Brisbane CBD

Project infrastructure	Potential impacts on the landscape and physical environment
Northern portal	
Engineering infrastructure at Victoria Park, including: - tunnel portals - dive structure - cut and cover tunnel - feeder station.	Landscape amenity - Some existing mature trees and screening vegetation would be removed to allow construction of the Project in this area. Residential amenity - In the longer term, the project infrastructure is not expected to impact on the amenity of local residents due to the relatively discrete nature of the portal and dive structure within or adjacent to the existing rail corridor. Land use and variety - The Project would not change the predominant land use of rail infrastructure and park space in the area. Landmarks and legibility - Local landmarks and legibility would not be impacted by the Project due to the relatively discrete nature of the portal and dive structure within or adjacent to the existing rail corridor. Visual environment - During operation, the Project would be located in a low lying portion of Queensland Rail land adjacent to the park. As such, views to the portal would be limited to park users, as well as some transitory views of the portal from the land bridge, York's Hollow and Victoria Park golf course. - The feeder station would be the most visible legacy of the Project in this location. This would be utilitarian in form and function and is proposed to be located in a low lying area of Victoria Park. The main visual impacts would be on park users, Queensland Rail patrons and transitory views from the ICB.

Project infrastructure	Potential impacts on the landscape and physical environment
Construction related works, including: • construction worksite in Victoria Park adjacent to Exhibition Loop • surface construction works. The impact from construction activities would be temporary.	Landscape amenity • The construction site is approximately 35,000 m² in size and would require some areas of grassy open space and mature vegetation to be removed. Residential amenity • The construction worksite may impact on the amenity for local residents. However, the residents in this area are situated on the south-east side of Gregory Terrace and are visually screened from views to the bottom of the park where it interfaces with Queensland Rail land. The primary impact would be for residents located near the access to the construction site at Gregory Terrace, due to increased construction traffic. Landmarks and legibility • While the construction worksite would impact on the Victoria Park landmark, the construction worksite is situated away from the Centenary Pool and would not impact on this major landmark. However, users of the pool would have views of the worksite. • The worksite access at Gregory Terrace may impact on the existing sub-tropical plantings adjacent to the existing entry road. Visual environment • The worksite is located in a low lying portion of the park and as a result views to the worksite would be most visible to park users. There would be some transitory views to the construction site from the ICB, the land bridge, and users of York's Hollow and the Victoria Park golf club to the north.
Roma Street Station	
New Roma Street Station, including: • new station entrances • station plaza at Roma Street entrance.	Landscape amenity • The Project would remove a number of large mature trees, gardens, palms and grassy open space at the north-west portion of Emma Miller Place and the open space west of the Roma Street entrance to the Roma Street Parkland. Residential amenity • During operation, the Project would improve access to public transport options and local connections for local residents. • There would be no negative visual impacts for residents. Landmarks and legibility • The location of the station entry at Roma Street, would impact on a portion of Emma Miller Place. • The Project would not impact visually on the State Heritage listed Roma Street Station building. Visual environment • The new station would integrate with the surrounding urban setting. Potential changes to the visual environment may occur from the loss of a portion of open space in Emma Miller Place. Implementation of the urban design principles into detailed design may further improve visual amenity.
Surface changes, including provision of new footpaths and streetscape improvements at Roma Street.	Landscape amenity and visual environment • Surface changes would improve the landscape amenity and visual environment in this location through streetscape improvements Landmarks and legibility • Streetscape works would not impact on landmarks in this location.

Project infrastructure	Potential impacts on the landscape and physical environment
Construction related works, including: • construction worksite at Roma Street between the transit centre and Emma Miller Place • construction worksite adjacent to the heritage listed Roma Street Station • construction worksite within the existing Roma Street Station car park • construction support site at the northern end of Roma Street Parkland • surface construction works. The impact from construction activities would be temporary	Landscape amenity • The worksites would remove mature trees, vegetation and grassy open space at the Roma Street entrance to the Roma Street Parkland. Residential amenity • Due to the nature of high rise buildings within the Brisbane CBD, views of the construction worksites would occur. • The southern worksites would impact on amenity for residents of the eastern apartments within the Roma Street Parkland who overlook the worksite. • The northern worksite would impact on amenity for residents of the western apartments within the Roma Street Parkland who overlook the worksite. • Construction works and activity is common within the Brisbane CBD and Project works would generally be accommodated within the visual environment. Landmarks and legibility • The worksite at the Roma Street entrance to the Roma Street Parkland would impact on this entrance and on Emma Miller Place. Visual environment • The most visible worksite would be adjacent to Roma Street as it is exposed to passing traffic and overlooked by several office buildings. • Other worksites would be visible by station users, office workers in the transit centre complex and the eastern apartments within Roma Street Parkland. The construction support site would be visible for people accessing the Roma Street Parkland apartments, visitors to Roma Street Parkland, transitory views from the rail corridor, and residents in the north-western apartments at Roma Street Parkland.
Albert Street Station	
Albert Street Station, including: • station access at the corner of Mary and Albert streets (entry 1) • station access at the corner of Alice and Albert streets (entry 2) • station access adjacent to City Botanic Gardens in Alice Street (entry 3).	Landscape amenity • The station is not expected to change the landscape amenity, with the existing mature street trees at the location of the two primary entries to be retained. • Potential impacts to the landscape amenity of the City Botanic Gardens at Alice Street, through the potential for the construction of the pedestrian underpass and canopy to impact on existing figs along the boundary of the Gardens. While the works would not be undertaken within the Gardens, the canopies and the root structures that intrude into the footpath area may be impacted. Residential amenity • The new stations would improve amenity for local residents through upgrading of the streetscape and improved access to convenient and well connected public transport. Predominant land use and variety • The Project would impact on the active street frontage of Albert Street by removing existing retail shops near the corner of Mary and Albert streets. However, the station and plaza area in this location is proposed to provide opportunities for some retail uses. • The street frontage to Albert Street at the Royal on the Park hotel is currently inactive. The proposed entry at this location would provide opportunities for renewal of this section of Albert Street, including the provision of active street frontages.

Project infrastructure	Potential impacts on the landscape and physical environment
	Landmarks and legibility - Provision of entry 2 would require the acquisition of the Royal on the Park hotel and would result in the removal of this familiar landmark on the Brisbane skyline. - Entry 3, including escalators and canopy structure would impact on the external pavement and general entrance experience to the City Botanic Gardens. Visual environment - The Royal on the Park hotel building has a distinct presence in Brisbane's architectural history, due in part to the "wave" profile of balconies and punctuating spherical light fittings. The removal of this building would change the existing visual environment in this location. The low level shops at the corner of Mary and Albert streets have limited visual interest as a physical structure, and the removal of these buildings is not expected to change adversely the visual environment of this location, apart from their function of providing an active street frontage.
Changes to surface roads and pavements	Landscape amenity, residential amenity and visual amenity - The Project is expected to result in a positive change to the streetscape environment of Albert and Alice streets by providing high quality architectural stations, plazas, widened footpaths, street trees and street furniture. Predominant land use and variety - The Project would act as a catalyst for development in this location and provides opportunities for increased variety within the Albert Street streetscape.
Construction related works, including: - worksites at the corner of Alice and Albert streets and Mary and Albert streets - surface construction works. Construction activities would be temporary and predominantly occur within acoustic sheds.	Landscape amenity - Construction works may require the removal of some street trees which would impact on the landscape amenity of this location. Residential amenity and visual environment - Construction works would change the visual environment in the vicinity of construction worksites. - Due to the nature of high rise buildings within the Brisbane CBD, views of the construction worksites would occur from nearby high-rise residential and commercial buildings. These views would primarily be of acoustic sheds. Landmarks and legibility - A construction worksite is proposed to be located on the site of the Royal on the Park hotel, which would require the removal of this building. This building has a distinct presence in Brisbane's architectural history and the removal of this building would change the existing visual environment in this location.

South of the River (Kangaroo Point to Fairfield)

The Gabba Station would be located on the site of the current Goprint building, within the Woolloongabba UDA. The station has been situated to take advantage of the opportunities arising from the existing busway station, redevelopment of the UDA and the Gabba stadium, and to support major urban regeneration of the area.

The major benefits of the Project in this location are tied into the redevelopment of the UDA. The new station has been designed to allow for development above it. The station entrance is proposed to provide a landmark shade structure design, which would be visible from Stanley Street and would aid legibility and wayfinding throughout the UDA precinct. Views between the new station and the Gabba stadium would be provided through the UDA site to ensure adequate legibility and wayfinding (refer to **Figure 10-6**).



Figure 10-6 Representative view of Woolloongabba Station from Leopard Street (potential UDA developments visible)

The main impact on the visual and physical environment in this location would be the demolition of the Goprint site and the temporary use of this site for a major construction site. More permanent changes would occur from the station.

The Boggo Road Station would be located within the Boggo Road Urban Village, between the Ecosciences Precinct and the Boggo Road Gaol. The station would have two accesses, north and south of the main pedestrian spine.

The station entries would provide improved accessibility and connectivity throughout this precinct and support the future development of this area for mixed-use activities including residential, environmental, research, retail commercial and recreational facilities. In the immediate future, the Project would deliver minimal change to the visual environment and surface road changes would improve local residents' amenity by improving safety.

The main visual impact of the Project at Boggo Road would occur during construction. The Project would impact on the existing works undertaken along the pedestrian spine and the structure located next to the heritage listed Boggo Road Gaol. The pedestrian spine may be impacted for works for the Boggo Road Urban Village.

A ventilation and emergency access building is proposed to be located adjacent to Fairfield Road, Fairfield, on land currently used for a landscape median and substation, between Bledisloe and Sunbeam streets.

Construction of the ventilation and emergency access building would require the realignment of Railway Road closer to the existing Energex substation. Construction of the shaft and building would also require the removal of some existing vegetation currently located on land between Fairfield and Railway roads.

The building footprint would be approximately 24 m by 7 m by 5 m high, and include an 8.5 m high outlet. The building is proposed to be architecturally designed and treated to minimise potential impacts on the visual amenity in this location (refer to **Figure 10-7**) and would be sufficiently offset from Fairfield Road to allow for vegetation to be planted between the building and the roadway.



Figure 10-7 Representative view of ventilation and emergency access building

A worksite would be required for the ventilation and emergency access building. Following construction, this land would be established as a greenspace that would accommodate vegetation and evacuation capacity from the ventilation and emergency access building during an emergency. In the longer term, the construction site is not expected to impact on the landscape amenity of the immediate area.

A summary of the potential impacts of the Project's construction and operation in this section of the study corridor is provided in **Table 10-4**.

Table 10-4 Potential impacts on the landscape and physical environment – Kangaroo Point to Fairfield

Project infrastructure	Potential impacts on the landscape and physical environment
Woolloongabba	
New Gabba Station, including central entry point at the middle of the station.	Landscape amenity - The Project would change the landscape character and amenity in this location from one consisting primarily of Casuarinas and screening shrubs to a more urban landscape character, ie single street trees and contained garden beds. The landscaping undertaken would be consistent with the requirements of the UDA. Residential amenity - The Project would improve residential amenity for residents in this area. Predominant land use and variety - The new station would support a number of existing uses in this area, such as the Gabba stadium and the future UDA development. Landmarks and legibility - Views from the station would be provided to the Gabba stadium, which is a key landmark in this area, and would enhance legibility from this precinct to the stadium. - The Project would not impact on surrounding landmarks such as the Russian Orthodox Cathedral, the Woolloongabba Post Office, or the former Woolloongabba Police Station.

Project infrastructure	Potential impacts on the landscape and physical environment
	Visual environment - The Project would change the visual environment in this location with the removal of the Goprint building. However, the visual environment surrounding the proposed station location would change over time with the redevelopment of the urban development area for high rise commercial and residential uses. The development of the station would be in keeping with this. - It is expected that the layout of future development within the urban development area would preserve the direct line of site between the new station and the Gabba stadium.
Construction related works, including: - worksites at the site of the Goprint building - surface construction works. Construction activities would be temporary and would occur within an acoustic shed.	Landscape amenity - The establishment of the construction worksite would require removal of existing vegetation on the Goprint site. Residential amenity - Construction works are expected to be visible from some residential units in high rise buildings located north-west of the worksite. Landmarks and legibility - The worksite would not impact on existing landmarks or legibility within this area. Visual environment - The worksite would change the visual environment of this area, due to the establishment of site infrastructure such as acoustic sheds, site offices and noise barriers. Given the temporary nature of these buildings and the relative containment of these, visual impacts are likely to be manageable at street level through the use of hoardings.
Boggo Road	
New Boggo Road Station, including: - station access at the northern end (entry 1) - station access at the southern end (entry 2).	Landscape amenity - In the longer term, the Project would not impact on the landscape amenity of the pedestrian spine adjacent to the Ecosciences Precinct, with this being reinstated following construction of the station. Residential amenity - In the longer term, the Project would improve residential amenity in this area for both existing residents located in the residential area south of the urban village, as well as future residents who relocate to the area as part of the Boggo Road Urban Village redevelopment. Predominant land use and variety - In the longer term, the Boggo Road Urban Village is proposed to comprise of a mix of uses including residential, commercial, retail and cultural uses. - The station would support these future uses and contribute to the diversity of land uses at this location. Landmarks and legibility - The Project would not directly impact on the State Heritage listed Boggo Road Gaol, which is an important landmark in this location. Visual environment - The visual environment surrounding the proposed station location would change over time with the redevelopment of the Boggo Road Urban Village for high rise commercial and residential uses. The development of the station would be in keeping with this.

Project infrastructure	Potential impacts on the landscape and physical environment
Engineering infrastructure including: - a stand-alone service building at the southern end of the station - a stand-alone service building at the northern end of the station.	Landscape amenity - The southern service building would change the landscape amenity of this area through impact on pedestrian paths and landscape planting. Residential amenity - Potential impacts of the southern service building on existing residential amenity are expected to be minimal, although impact may occur for future residents of the Boggo Road Urban Village, depending of the timing of this development. Landmarks and legibility - The southern service building would impact on the open space setting surrounding the Boggo Road Gaol. Visual environment - The southern service building would result in fragmentation on the landscaped setting for the State heritage listed Boggo Road Gaol, and impact on the recreational and landscape values of this area.
Changes to surface roads and pedestrian connections, including: - pedestrian crossing at Peter Doherty Drive and Boggo Road - reinstatement of the landscaped pedestrian spine between the Gaol and the Ecosciences Precinct.	Landscape amenity, residential amenity and visual environment These works would not have long term impacts on landscape amenity, residential amenity or the visual environment.
Construction related works including: - worksite adjacent to Peter Doherty Drive - surface construction works, including for the construction of the station cavern. The impact from construction activities would be temporary.	Landscape amenity - Surface construction activities would impact on landscape amenity in this location, including temporary disruption to the landscaped pedestrian spine. - The construction worksite would also be located on the landscaped open space area at the corner of Annerley Road and Peter Doherty Street. Residential amenity - Potential impacts of construction works on existing residential amenity are expected to be minimal, although impact may occur for future residents of the Boggo Road Urban Village, depending on the timing of this development. Landmarks and legibility - Construction works would not directly impact on the landmark of Boggo Road Gaol No. 2 and Division No. 1. Visual environment - The construction worksite would be visible from Annerley Road and surrounding buildings, including the Ecosciences Precinct, Dutton Park State School and Police Station. - The worksite may also be visible for some residents immediately south of the Boggo Road Urban Village.

Project infrastructure	Potential impacts on the landscape and physical environment
Ventilation and emergency access building	
Engineering infrastructure, including the ventilation and emergency access building and associated shaft.	Landscape amenity, residential amenity and landmarks and legibility - The ventilation and emergency access building would impact on the existing landscape median between Fairfield Road and Railway Road at Fairfield. Visual environment - The visual environment would be changed in this location, with the landscape area between Fairfield Road and Railway Road replaced with a built structure. - The Project would result in changes to the visual amenity from properties: - at Railway Road, south of Bledisloe Street, including residential and commercial (vet) properties - at Bledisloe and Sunbeam streets between Fairfield Road and Cross Street, including a church and residential uses - fronting the western side of Fairfield Road between Venner Road and Love Street.
Construction related works, including: - construction worksite - surface construction works, including for the construction of the shaft. The impact from construction activities would be temporary.	Landscape amenity - The construction worksite would result in some change to the landscape amenity of the properties between Railway Road and Fairfield Road. Residential amenity - Potential impacts on residential amenity may also occur for residents along Railway Road, Bledisloe Street and Sunbeam Street. Landmarks and legibility - Construction works would require the realignment of Railway Road between Bledisloe Street and Sunbeam Street. Due to the short distance of the realignment, the existing legibility of Railway Road would not be impacted. Visual environment - Construction works in this location would change the visual environment of the immediate local area, with the provision of site offices, plant and equipment. - Construction works would impact the visual amenity from properties on Railway Road, on Bledisloe Street and Sunbeam Street between Cross Street and Fairfield Road and on Fairfield Road between Venner Road and Love Street. These include a church and residential and commercial uses. - Construction works on the side of Fairfield Road would change the visual experience for users of Fairfield Road.

Southern section (Yeronga to Salisbury)

The new Yeerongpilly Station would replace the existing station. Works associated with the establishment of the station include the realignment of Wilkie Street, extension of the existing pedestrian overpass to connect to the realigned Wilkie Street and development of a public plaza fronting the realigned Wilkie Street (refer to **Figure 10-8**).

The station would be designed with a contemporary architectural approach, in keeping with the other Cross River Rail stations, but which also reflects the character and scale of the surrounding residential area.

Changes to the visual and landscape character of this area would occur for construction and operation.

The additional surface tracks would require the widening of the existing rail corridor. Widening the rail corridor would increase its visual prominence within the visual environment.

Overall, the new station and associated streetscape works at the realigned Wilkie Street would provide positive changes to the visual environment. The station and realigned Wilkie Street would require the acquisition and removal of a number of residential properties, within an area identified as a demolition control precinct (DCP) by the City Plan. The properties make up a small proportion of the total number of properties within the DCP as a whole and the loss of these properties is not expected to change the streetscape or local characters of Livingstone, Green, Stamford or Crichton streets.

The removal of properties along the existing Wilkie Street would result in a number of properties on Livingstone, Green, Stamford or Crichton streets becoming corner blocks with dual street frontage. As such, limited buildings would address the realigned Wilkie Street, reducing the passive surveillance currently provided by buildings fronting Wilkie Street.



Figure 10-8 Representative view of Yeerongpilly Station from the realigned Wilkie Street

To mitigate operation noise impacts, noise barriers are proposed at:

- Yeronga, on the eastern side of Fairfield Road, south of the Cardross Street bridge
- Yeerongpilly, adjacent to Wilkie Street
- Rocklea, at Station Street
- Salisbury, at Fairlie Terrace.

Table 10-5 provides details of the proposed operational noise barriers.

Table 10-5 Proposed operational noise barriers

Location	Length (m)	Height (m)	Area (m ²)
Yeronga	165	4.5	735
Yeerongpilly Station	155	4	625
North of Rocklea Station	43	5	217
South of Rocklea Station	88	4.5	395
North of Salisbury Station	214	5	1,070
South of Salisbury Station	375	6 to 7	2,345

Note: The southern portion of Noise Barrier south of Salisbury Station (approximately 375 m) replaces an existing noise barrier of 1.5 to 4.5 m in height.

The noise barriers would comprise of a mix of patterned concrete and transparent panels (example provided in **Figure 10-9**). The noise barriers would be visually prominent features in the visual environment and would limit views of the rail corridor. The barriers also would reduce the opportunity for expansive views of the visual environment. The transparent panels would allow for some light penetration and for some views over the rail corridor.

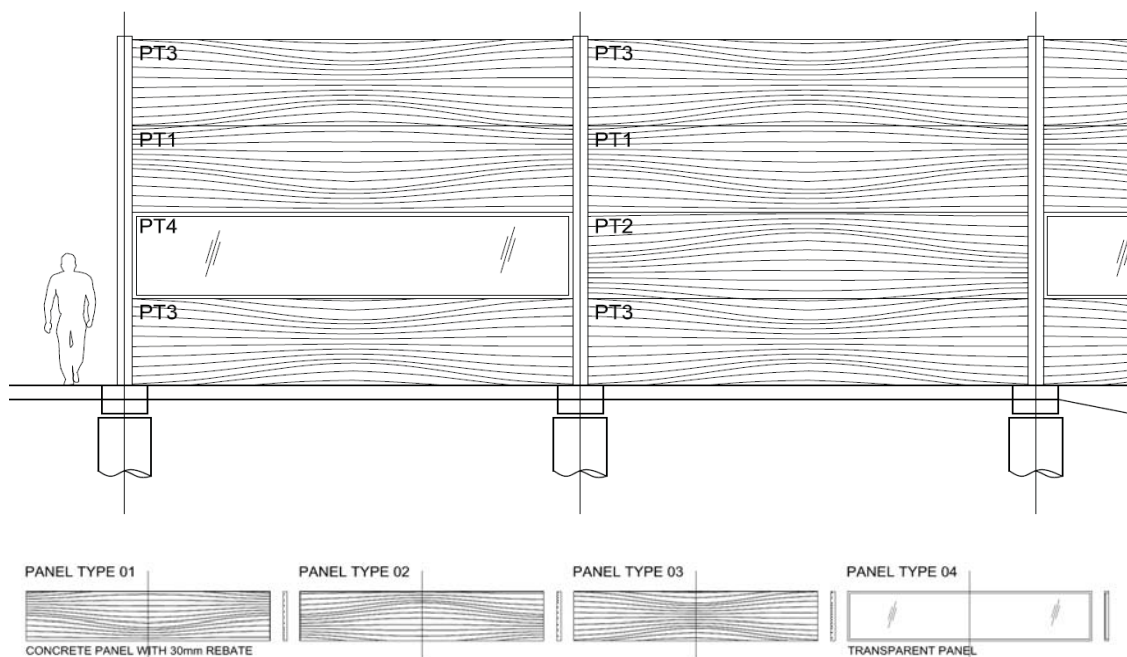


Figure 10-9 Representation of possible noise barriers

The main worksite at Yeerongpilly is proposed to be located within the industrial precinct at Lucy Street and immediately north of Moolabin Creek. The worksite would also incorporate the area of the current Wilkie Street between the industrial precinct and Cardross Street.

During construction, views would occur from the residential area east of Wilkie Street of the construction sites and site infrastructure, including workshops, site offices, plant and equipment, and worker parking areas. In particular, residents on the southern side of Livingstone Street and the realigned Wilkie Street would be provided with direct views of these works.

A bridge structure across Moolabin Creek would also be required south of the new Yeerongpilly Station. The bridge would impact on the landscape amenity of Moolabin Creek and would be visible from surrounding residential communities as well as from vehicles passing on Fairfield Road.

Works at Moorooka Station include the upgrade of the station and pedestrian overpass, the provision of additional surface tracks, and construction of a rail viaduct extending approximately 700 m, adjacent to Moorooka Station and the eastern side of Clapham Rail Yard. At its highest point, the viaduct would be approximately 9 m above the existing ground level.

Overall, the upgraded station would enhance accessibility and improve the visual experience in the area immediately surrounding the station. The works would require the removal of properties adjacent to Ipswich Road between Hamilton Road and Muriel Avenue. Existing views to Clapham Rail Yard and the rail corridor in this location are currently prominent from many local viewpoints, and the removal of these buildings would result in minimal change to what is currently viewed as an intensive rail and transport corridor. However, views of rail infrastructure within the Clapham Rail Yard from nearby residential properties and from passing traffic on Ipswich Road would be heightened by the presence of the viaduct. The viaduct would be a visually prominent structure that would comprise a combination of embankment and piled structures.

At Rocklea and Salisbury, additional surface tracks would be required including a new bridge over Muriel Avenue, realignment of the Ipswich Motorway on-ramp from Fairfield Road and new pedestrian overpasses at Rocklea Station and at Salisbury, near Nyanda State High School. The existing pedestrian overpass at Salisbury Station would also be extended to the west to allow for the widened rail corridor. The upgrade of Rocklea Station would enhance accessibility in this location.

The provision of a new rail bridge over Muriel Avenue and the realignment of the Ipswich Motorway on-ramp would change the visual environment of these locations. The rail bridge is proposed to be at a greater height than the existing bridges over Muriel Avenue. The realigned on-ramp would require trees within the south-eastern embankment of the motorway to be removed, impacting on the landscape amenity of this road corridor.

The removal of industrial properties at Annie Street to allow widening of the rail corridor would expose residents south of Annie Street to views of the rail corridor. The provision of noise barriers with vegetative screening would assist in reducing impacts on residential amenity for this neighbourhood as well as reduce the visual impacts associated with the removal of these industrial properties. Noise barriers are also proposed between the rail corridor and Fairfield Road near Yeerongpilly Station and east of the rail corridor in Salisbury.

A summary of the potential changes of the Project's construction and operation in this section of the study corridor is provided in **Table 10-6**.

Table 10-6 Potential impacts on the landscape and physical environment – Southern section (Yeronga to Salisbury)

Project infrastructure	Potential impacts on the landscape and physical environment
Yeronga	
Engineering infrastructure, including noise barriers.	Noise barriers at Fairfield Road would screen the view of the rail corridor for properties located west of Fairfield Road, although may impact on distant views from these properties. The noise barriers may also impact on distant mountain views to the west from properties on the eastern side of the rail corridor. Vegetation screening of the noise barriers would assist in reducing the visual impacts, particularly for near neighbours.
Yeerongpilly	
New Yeerongpilly Station including: - station building, platforms and overpass - realignment of Wilkie Street - provision of recessed bus bays at Fairfield Road.	Landscape amenity and residential amenity - In the longer term, the Project would enhance the landscape amenity in the vicinity of the new station, through the provision of streetscape improvements to the realigned Wilkie Street, including new pavement treatments, street trees and street furniture. Visual environment - The new station would enhance the visual environment of the surrounding area, with the station fitting with the scale and character of the existing nearby residential area.
Engineering infrastructure, including: - southern portal and dive structure - feeder station - noise barriers.	Visual environment and residential amenity - The southern portal would be in cut at the level of the existing rail tracks. As such, this would not be visible to surrounding residents or passersby. - The visual experience looking eastwards from Fairfield Road towards the realigned Wilkie Street would be changed, with a more prominent grade change and 6 m high retaining wall structure located parallel to the realigned Wilkie Street. - The feeder station and Energex substation are proposed to be located east of the Cross River Rail tracks and south of the new Yeerongpilly Station. The structures would be utilitarian in nature and would be visually accommodated within the visual environment dominated by the rail infrastructure. - Noise barriers along Wilkie Street would impede views from the residential properties located to the east towards the rail corridor and the distant mountains to the west.

Project infrastructure	Potential impacts on the landscape and physical environment
Construction related works, including: • worksite at the existing Wilkie Street alignment • worksite at the Yeerongpilly industrial precinct, adjacent to Moolabin Creek • surface construction works. Construction activities would be temporary and would occur largely within an acoustic shed at the Yeerongpilly worksite.	Landscape amenity • Construction works would impact on the existing landscape amenity of Wilkie Street, although this would be reinstated along the realigned Wilkie Street. • The construction worksite adjacent to Moolabin Creek would impact on the landscape amenity of the creek, although this is currently low. Visual environment and residential amenity • The worksites may impact on amenity for local residents due to the visual impacts from work sheds, site offices and other site plant and equipment. This would particularly impact on residents at Livingstone Street that back onto the major Yeerongpilly worksite. • The provision of hoardings around these sites would assist in mitigating visual impacts of construction activities.
Moorooka	
Upgrade of Moorooka Station and surface road changes.	Landscape amenity • The realignment of Ipswich Road between Keats Street and Hamilton Road would require the removal of four figs from the centre median. Visual environment • The upgrade of Moorooka Station and surrounding area would improve the visual environment in this location. • The removal of residential buildings between the rail corridor and Ipswich Road would open views to Clapham Rail Yard for motorists and nearby businesses. The yard is heavily industrial in nature. • The removal of light industrial buildings between Fairfield Road and the rail yard would open up views to the rail yard from the Brisbane Golf Club.
Engineering infrastructure, including • grade separated bridge over Moolabin Creek • viaduct within Clapham Rail Yard, adjacent to Moorooka Station.	Landscape amenity • The bridge over Moolabin Creek would impact on the landscape amenity of the creek. Residential amenity • The bridge over Moolabin Creek and the viaduct over Clapham Rail Yard are not expected to impact on existing residential amenity. Visual environment and landmarks and legibility • The bridge over Moolabin Creek and the viaduct structure within Clapham Rail Yard adjacent to Moorooka Station would disrupt views from some locations to the distant mountain range to the west. • The viaduct would increase the overall visibility of rail infrastructure within Clapham Rail Yard from Ipswich Road and residential properties to the east.
Construction related works including: • worksite at Moorooka and Clapham Rail Yard • surface construction works, including realignment of Ipswich Road. The impact from construction activities would be temporary.	Landscape amenity • Construction of the bridge over Moolabin Creek would impact on the banks of the creek and riparian vegetation. Residential amenity • The works in this location are relatively removed from residential uses and would therefore have minimal impact on amenity.

Project infrastructure	Potential impacts on the landscape and physical environment
Rocklea	
Engineering infrastructure, including: • rail bridge over Muriel Avenue • realignment of the Ipswich Road on-ramp • pedestrian overpass • noise barriers.	Landscape amenity • The realigned on-ramp to the Ipswich Motorway would impact on existing trees within the embankment of the motorway. • The bridge over Muriel Avenue would remove trees east of Fairfield Road between the rail corridor and Fairfield Road. Visual environment • The bridge over Muriel Avenue would add to the visual clutter of this intersection. • The realigned on-ramp to the Ipswich Motorway would not change the visual environment of this area, which is essentially an area of intense road and rail infrastructure. • The upgrade of Rocklea Station would improve the visual experience of the station and its immediate surrounds. • Views towards the rail corridor and beyond from the residential properties on Brooke Street and Annie Street are generally impeded by existing industrial buildings. Consequently, the provision of noise barriers would result in minimal changes to the visual environment for these properties.
Construction related works, including: • construction worksites • surface construction works, including realignment of Ipswich Motorway on-ramp and Muriel Avenue bridge. The impact from construction activities would be temporary.	Landscape amenity • The existing landscape amenity of this area is low, although existing established trees in the worksites in this location have the potential to be impacted by the works.
Salisbury	
Engineering infrastructure, including: • new pedestrian overpass at Fairlie Terrace and Heaton Street, near Nyanda State High School • extension of pedestrian overpass at Salisbury station • noise barriers.	Landscape amenity • The pedestrian overpasses at Fairlie Terrace and Salisbury Station would not impact on landscape amenity in this area. Visual environment • While the pedestrian overpasses would add to the existing visual clutter of the existing environment in this location, the existing visual environment is light industrial in nature and of relatively low quality. • Noise barriers are currently located along the rail corridor between Salisbury station and Riawena Road. Proposed barriers near Fairlie Terrace would impede views of the rail corridor and may impede distant views from Fairlie Terrace, Blackwood Road and Lillian Avenue. However, houses on Fairlie Terrace generally front onto either Blackwood Road or Lillian Avenue, which run perpendicular to Fairlie Terrace. As such, views from these houses are not expected to be adversely affected. Vegetation screening of the noise barriers along Fairlie Terrace would assist in reducing the visual presence of these structures and impact on street views towards the rail corridor.
Surface road changes, including: • closure of Heaton Street and Railway Parade level crossing • realignment of Dollis Street.	Residential amenity and visual amenity • Some light industrial properties currently located adjacent to the rail corridor at Annie Street would be acquired and removed for the Project. This would expose existing residents south of Annie Street to views of the rail corridor.

Project infrastructure	Potential impacts on the landscape and physical environment
Construction related works, including: - worksites - surface construction works. The impact from construction activities would be temporary.	Landscape amenity and visual environment The worksites and surface construction works are not expected to impact on the landscape amenity or visual environment of this area, which are of relatively low quality.

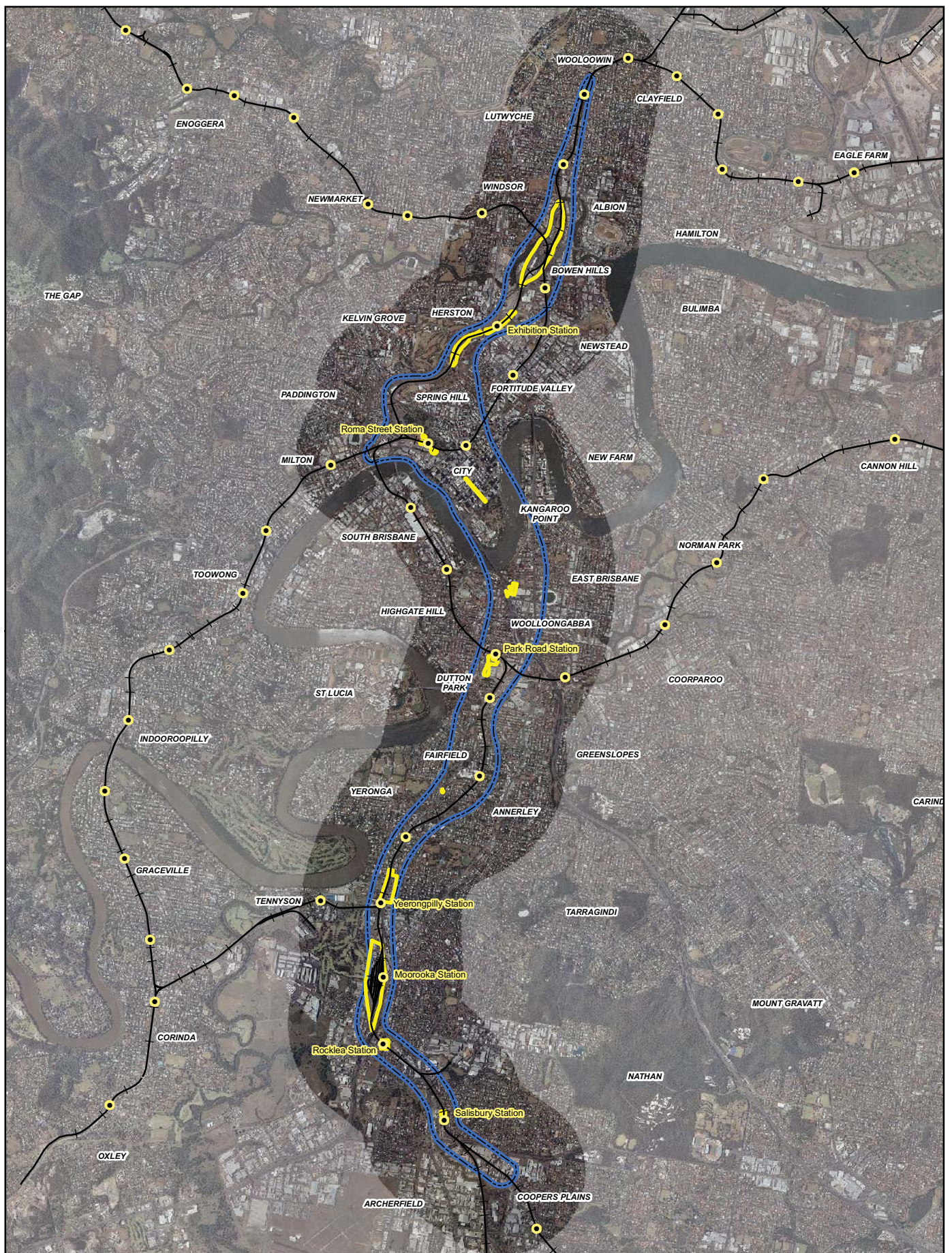
10.3.3 Visual assessment – overview

This section provides an assessment of the visual impacts of the Project's surface infrastructure for nearby neighbourhoods.

The methodology for this visual assessment has been adapted from the *Guidelines for Landscape and Visual Assessment* (Landscape Institute and IEMA 2002). It involved:

- establishment of baseline information, including
 - identification of key target areas, shown in **Figure 10-10**, which generally focussed on those areas where works are proposed
 - analysis of the visual catchment, to identify those locations which have the potential to view target areas
 - identification of representative viewpoints, which includes those areas in which the project infrastructure is likely to be viewed
 - description of the existing visual environment, to establish existing condition to assess potential changes
- qualitative assessment of potential landscape and visual impacts, based on the
 - sensitivity of location or receptor, ie low, moderate or high
 - visual modification, being the likely extent of change to the existing landscape or visual amenity from a given viewpoint, ie no modification, small modification, moderate modification, large modification.

Further information on the methodology used for this visual assessment is in **Appendix F**.

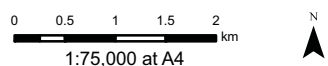


LEGEND

- Study Corridor
- Station
- Track
- Target Area

CROSS RIVER RAIL ENVIRONMENTAL IMPACT STATEMENT

Figure 10-10
Target Areas for
Visual Assessment



CrossRiverRail

SKM aurecon
CRR JOINT VENTURE

Visibility of Project elements

This section provides a summary of the visibility of key project elements within each section of the study corridor. It includes a description of the target area and existing visibility and potential views of the project infrastructure.

The viewshed modelling presented in this section is indicative of those areas in the study corridor and its surrounds which would potentially view the target areas. This was principally determined by the terrain of the study corridor and surrounding area. It does not represent actual views, as many potential vantage points are likely to be obstructed by vegetation, buildings and distance as such, a one kilometre buffer has been applied around each of the target areas.

Northern section (Woolloowin to Bowen Hills)

The key target areas in this location are Mayne Rail Yard and the RNA Showgrounds. The following describes the visual catchment and potential visibility of project infrastructure in these areas. The outcomes of the viewshed model and further representative views of the target area are provided in **Appendix F Visual Amenity and Lighting**.

Mayne Rail Yard, Lanham Street, near O'Connell Terrace



Description of the target area: The target area is wholly occupied by the Mayne Rail Yard. Major road infrastructure is a dominant element within the vicinity of the area. The rail yard site is extensive within the local area and is characterised by a broad open area with rail tracks traversing the site from north to south and a number of sheds and low-rise buildings towards the west of the site.

Existing visibility of target area: The potential visual catchment for the Mayne Rail Yard extends to Hamilton Hill and elevated areas at Windsor and Woolloowin in the north, Kelvin Grove, Herston and Spring Hill in the south.

Views of the area may be possible from the ICB and Abbotsford Road as well as from the RBWH and elevated areas to the north-east. The presence of riparian vegetation along Breakfast Creek limits the opportunities for views of the Mayne Rail Yard from the residential properties situated to the west. From the top of Lanham Street near O'Connell Terrace (refer photo), the southern end of Mayne Rail Yard and one of the towers within the yard is visible. Expansive views of the rail yards are limited by the presence of road infrastructure.

Project works: Works in this location would include additional surface tracks and new elevated viaduct structure situated at a similar height and parallel to the ICB. Feeder stations are also proposed for this area between Lanham Street and the ICB on-ramp to the Clem Jones tunnel.

Project visibility: No potential vantage points are located to the west of the target area due to the obstruction of riparian vegetation along Breakfast Creek. However, some constrained views of the elevated viaduct structure may be possible from residential and other buildings that are taller than a single storey. The presence of screening between the ICB and the viaduct would limit views of the viaduct and rail yard from the ICB.

Views from the RBWH and elevated areas to the north-east to the Mayne Rail Yard may be possible. However the discernible degree of modification associated with the Project's surface works is likely to be small in a highly urbanised landscape that consists of existing elevated transport infrastructure.

Generally, changes to the views of this target area would be consistent with the existing nature of the visual environment. Although the Project would result in views of additional rail infrastructure, they would be accommodated within the rail and light industrial nature of the target area.

RNA Showgrounds



Description of target area: The RNA Showgrounds is a major event venue that contains a number of historically and culturally significant buildings and features. The showgrounds and the surrounding local streets experience large influxes of visitors during major events.

Existing visibility of the target area: The potential visual catchment for the RNA Showgrounds extends to Hamilton Hill and elevated areas of Ascot, Windsor and Woolloowin in the north, Herston and Kelvin Grove in the west, Spring Hill in the south and Bowen Hills in the east. Views from many of these locations would be constrained by the presence of vegetation and buildings.

Views into the RNA Showgrounds from Bowen Bridge Road and O'Connell Terrace are possible. Opportunities for views of the RNA Showgrounds increases during events as visitors are also able to view from within the showgrounds.

The photo shows views of the RNA showgrounds from O'Connell Terrace. Expansive views over the western half of the RNA Showgrounds are possible, with views to the eastern portion of the site from this location impeded by the presence of the buildings around the main show ring and the elevated rail corridor that traverses the site.

Project works: Works in this location include the new Ekka Station, additional surface tracks and the upgrade of O'Connell Terrace.

Project visibility: Views of the Ekka Station, elevated rail tracks and elevated O'Connell Terrace bridge within the target area would be possible. The establishment of these components would result in the permanent loss of views of heritage and culturally important features, including four of the seven fig trees within Show Ring No. 2 which are maintained as large topiaries, the pedestrian tunnel, railway viaduct/bridge and the embankment adjacent to the existing rail line.

Removal of the Dairy Cattle Pavilion, Pig and Dairy Goat Pavilion and Deer Pavilion would provide for expansive views of the RNA Showgrounds from O'Connell Terrace. These views would be reduced once the Project construction and redevelopment of the RNA Showgrounds commences.

Views of the Project in this area would be possible from O'Connell Terrace, Bowen Bridge Road and from within the RNA Showgrounds particularly during events. Although the station has been designed with a low profile to minimise conflicts with the heritage and cultural features within the RNA Showgrounds, some declines in the visual exposure of these features would be experienced.

Central section – Spring Hill to Dutton Park

The key target areas in this location are Victoria Park, Roma Street, Albert Street, Woolloongabba, Boggo Road and Fairfield. The visual catchment these areas and potential visibility of project infrastructure in these areas is described below. The outcomes of the viewshed model and further representative views of the target area are provided in **Appendix F Visual Amenity and Lighting**.

Victoria Park



Description of target area: The target area is within the rail corridor and Victoria Park. It is situated at a low elevated location along the northern boundary of the park. The target area contains rail corridor infrastructure and some Victoria Park facilities.

Existing visibility of the target area: The potential visual catchment of Victoria Park is likely to be confined to elevated areas immediately surrounding the target area, including Herston, Spring Hill and parts of Kelvin Grove. Within this catchment, actual views are limited due to the presence of mature vegetation throughout the streets and open space areas. Views of Victoria Park may also be possible from the ICB, Victoria Park golf club, Bowen Bridge Road and the RBWH. The photo shows views from a location adjacent to the Centenary Pool complex. Views of the target area are interrupted by the mature vegetation within the park.

Project works: Works in this location include the northern portal and a feeder station.

Project visibility: Once operational, the Project would be located in a low lying portion of Queensland Rail land adjacent to the park and opportunities to view the portal would be limited. There would be some transitory views to the portal from the land bridge, within York's Hollow, Victoria Park golf club, from the ICB and part of the RBWH.

The low-lying location of the northern portal would limit views from park users and residents situated on Gregory Terrace. As the Project would be located within and adjacent to the existing rail corridor, the northern portal and the surface tracks would deliver minimal visual change to the visual environment. As the feeder station would be located in a low lying area of Victoria Park the main visual impacts would be on park users, Queensland Rail patrons and motorists on the ICB.

Roma Street



Description of target area: Roma Street Station is one of the key transport hubs within the Brisbane CBD. In addition to providing public transport services, it is also occupied by a number of commercial office buildings, retail outlets and accommodation.

Existing visibility of target area: The potential visual catchment for Roma Street Station is mostly confined to elevated areas within the Brisbane CBD. Due to the highly urbanised nature of the area, most views are only achievable within a catchment around the immediate site.

Views may be possible from within nearby buildings and publically accessible areas, including Roma Street Forum, Roma Street Parkland along Upper Albert Street and College Road.

The photo shows views from a location on the corner of Hershel Street and George Street. From this location the Roma Street frontage of the Roma Street Station is visible. Differing views of Roma Street Station from other locations, including Roma Street Parkland, Countess Street, Albert Street and Wickham Street, are also possible.

Project works: Works in this location would include construction of a new underground station and associated entrances.

Project visibility: The Roma Street underground station access at Emma Miller Place would be the most visible component within this target area once the Project is operational. Other visually prominent features within this target area would be the proposed changes to the urban environment along Roma Street and underground station accesses within the Roma Street Station complex. The views of the underground station accesses from within the Roma Street Station complex would be consistent with the expected views at this location and would not impact on the visual environment.

Albert Street



Description of target area: The Albert Street target area is situated along the roadway between Queen Street and Mary Street. The target area contains an active streetscape that is enclosed by the adjacent character buildings and modern residential and commercial towers.

Existing visibility of target area: The potential visual catchment of Albert Street extends east towards Kangaroo Point and New Farm. Rises to the north and west limit the visual catchment in these directions. However, due to the enclosed nature of the target area as a result of the high density development, actual views from locations beyond Albert Street would be limited.

The photo is located within Albert Street. From this vantage point, views along the linear target area are possible. Active features within the target area, such as vehicles and pedestrians, are visually prominent.

Project works: Works in this location include the new Albert Street Station and associated entrances.

Project visibility: The changes to the visual environment within this target area would primarily be viewed by travellers along Albert Street and occupants of buildings that front onto it. Due to the high density nature of the street, views of the Project from locations beyond Albert Street would be limited.

Woolloongabba



Description of target area: The target location includes the existing Queensland Government site that is bounded by the Pacific Motorway, Stanley Street, Vulture Street and Main Street. It contains government buildings and the Woolloongabba busway station.

Existing visibility of target area: The potential visual catchment for the target area extends to elevated areas to the west, such as Highgate Hill and east, such as East Brisbane. Due to the highly urbanised nature of the visual catchment and the distance between the target area and potential vantage points, discernable views of the target area are unlikely. Views of the target area from the Pacific Motorway, Vulture Street or other locations along Stanley Street would be likely.

The photo shows the visibility of the target area from the southern side of Stanley Street, as being partially impeded by the gradual rise in elevation.

Project works: Works in this location include the new Gabba Station.

Project visibility: At its proposed location, the station access building would be visible from Vulture Street, Stanley Street, Leopard Street, Pacific Motorway and the western entrances of the Gabba stadium. Once construction commences for the Woolloongabba UDA developments, opportunities for views of the station from these locations would be reduced. However, the Woolloongabba UDA development scheme proposes to allow for views between the Gabba Station and the Gabba stadium and Stanley Street to assist with way-finding and orientation. Views of the station from within the Woolloongabba UDA developments would be possible.

The station service buildings would be visible within the target area. As these buildings would be contained within the area bound by the Pacific Motorway, busway and associated on and off ramps, viewing opportunities would be limited primarily to travellers on these roads. Due to the nature of the visual environment at this location, these facilities would be sufficiently accommodated.

Boggo Road



Description of target area: The Boggo Road Urban Village contains the heritage listed Boggo Road Gaol and the recently constructed Ecosciences Precinct. The development of a number of high density residential and commercial buildings is proposed for this site. The site sits at the top of a rise and is surrounded by a number of transport facilities.

Existing visibility of target area: The potential visual catchment for Boggo Road is extensive, extending to elevated locations in all directions. The Boggo Road Gaol and Ecosciences Precinct are currently visible in some of these locations, particularly Coorparoo and Woolloongabba. As additional buildings are developed on this site, its visual prominence may increase.

This photo is from the western side of Annerley Road looking towards the Boggo Road Urban Village site and Peter Doherty Street. The view is representative of the typical view of the site for travellers along Annerley Road.

Project works: Works in this location include the Boggo Road Station and associated entrances.

Project visibility: The Boggo Road Urban Village is an on-going development and as such the visual environment post construction of the Project would be subject to the development programme of the precinct itself.

In the event that the Project is completed prior to the substantial completion of the Boggo Road Urban Village developments, the station accesses would be visible from external locations, such as Annerley Road, residential properties west of Annerley Road, residential properties north of Park Road station, Dutton Park State School, the police station, PA Hospital and residential properties north of Rawnsley Street. Once the Boggo Road Urban Village developments are established, the station accesses would be accommodated within the visual environment and would have limited visibility from external locations. In order to assist with way-finding and orientation, views would be maintained between the northern station access and Park Road station and busway station, along Peter Doherty Street from Annerley Road to the southern station access and along the pedestrian spine through the Boggo Road Urban Village.

The northern service structures would be accommodated within the views of the visual environment. Situating the southern service structure at its proposed location would fragment the landscaped open space designed to provide a recreation open space, community gathering space, and a landscaped focal point and setting for the Boggo Road Gaol.

Fairfield



Description of target area: The target area is a landscaped strip of land between Fairfield Road and Railway Road. Currently, the site has a low level of use.

Existing visibility of target area: The potential visual catchment for the target area extends throughout Fairfield to ridgelines along Highgate Hill, Dutton Park and Annerley. Due to its relative exposure there are numerous opportunities to view the target area, including from the nearby residential properties and from Fairfield Road.

The photo above is from the western side of Fairfield looking east towards the target area. Views of the target area from this location are only impeded by sparse vegetation plantings and passing traffic on Fairfield Road.

Project works: Works in this location include the ventilation and emergency access building.

Project visibility: The ventilation and emergency access building would be visible to travellers along Fairfield Road, Railway Road, Bledisloe Street and Sunbeam Street, and nearby residents. The ventilation and emergency access building would result in a change to the visual environment that is generally not representative of the structures that currently exist within this area of Fairfield.

Southern section – Yeronga to Salisbury

The key target areas in this location are Yeerongpilly, Clapham Rail Yard and Moorooka Station, Rocklea and Salisbury. The visual catchment and potential visibility of project infrastructure in these areas is described below. The outcomes of the viewshed model and further representative views of the target area are provided in **Appendix F**.

Yeerongpilly



Description of target area: The target location includes the Yeerongpilly Station, part of the rail corridor and some land east of the rail corridor, including Wilkie Street.

Existing visibility of target area: The potential visual catchment for the target area extends over a large distance to the north and south. Due to the presence of vegetation and development, views of the target area from the locations beyond Yeerongpilly are unlikely.

Views of the target area from Fairfield Road and the local roads that run perpendicular to Wilkie Street would be likely. The photo shows views along Wilkie Street and the rail corridor are provided from this vantage point at the northern end of Wilkie Street.

Project works: Works in this location include the new Yeerongpilly Station, southern portal, noise barriers and feeder stations and substation.

Project visibility: During operation, the most visible components of the station would be the station access from the realigned Wilkie Street and Station Road, the station concourse and pedestrian overpass. The station access would include views of the station public plaza that would include some street frontage retail, outdoor dining area and streetscape treatment with full pavement, street trees, seating and bike racks.

The portal would have limited visibility to surrounding residences or travellers. It would be located lower than the natural ground level and would be enclosed on each side of the rail corridor by noise walls.

While the noise barriers would reduce the views of the rail corridor, expansive views to locations beyond the rail corridors would also be diminished. In detailed design, refinements to noise barriers may be undertaken and mitigation measures explored to reduce their overall visibility.

The feeder station and Energex substation would be accommodated within the visual environment as part of the utilitarian nature of rail infrastructure. The use of landscaping would assist with the visual mitigation of the feeder station.

The bridge structure would be visible from nearby properties. However, as it would be traversing primarily through industrial areas, opportunities for it to be viewed by sensitive receptors are limited.

Clapham Rail Yard and Moorooka Station



Description of target area: The target area includes Moorooka Station and the Clapham Rail Yard. The area is primarily occupied by rail infrastructure. Industrial uses dependent on rail activities are located within the western portion of this target area.

Existing visibility of target area: The potential visual catchment for the target area is limited to nearby locations and elevated areas to the east. Due to the urbanised nature of land surrounding each target site and the catchment, viewing obstruction would be likely to limit views, particularly in areas of low relief.

Views of the target area from Fairfield Road are possible. The Clapham Rail Yards are most visible to travellers along Ipswich Road and people situated on Moorooka Station platforms.

The photo is taken from the eastern side of Ipswich Road looking north-west towards Moorooka Station. From this location Moorooka Station, freight trains and industrial uses on the western side of the target area are visible.

Project works: Works in this location include the upgrade to the Moorooka Station, including removal of station buildings and adjacent building on Ipswich Road, construction of pedestrian overpass and rail viaduct. The rail viaduct would comprise a combination of embankment and piled structures and would be approximately 9 m above ground level at its highest point.

Project visibility: Existing views to Clapham Rail Yard are currently possible from many local viewpoints. Consequently, the Project delivers minimal visual change to an intensive rail and transport corridor visual environment. The removal of buildings and light industry would increase the overall visibility of the rail yard, particularly from residential properties and Ipswich Road to the east and Brisbane Golf Club and Fairfield Road to the west.

The most visually prominent feature would be the rail viaduct that would be situated along the eastern boundary of the Clapham Rail Yard adjacent to Moorooka Station. As this structure would be elevated it would increase the visual prominence of rail infrastructure for travellers along Ipswich Road and occupants within commercial and residential properties on the eastern side of Ipswich Road.

Rocklea



Description of target area: The target area is the rail corridor, including the bridges over Sherwood Road and Rocklea Station. The rail corridor in this location traverses through a mix of industrial, residential and open space uses.

Existing visibility of target area: The potential visual catchment for the target area is limited to nearby locations and elevated areas to the east. Due to the urbanised nature of land surrounding each target site and the catchment, viewing obstruction would be likely to limit views, particularly in areas of low relief.

Views of the target area from the Ipswich Motorway, Ipswich Motorway on ramp, Station Street and Pegg Street, are possible. The photo is from the western side of Fairfield Road looking towards the rail bridge over Sherwood Road and the intersection of Sherwood Road and Fairfield Road.

Project works: Works in this location include a new bridge over Muriel Avenue, realignment of the Ipswich Motorway on-ramp from Fairfield Road, noise barriers and upgrade of Rocklea Station.

Project visibility: The most visible component of the works within this area would be the new rail bridge structure over Muriel Avenue and the realigned on-ramp to the Ipswich Motorway. The rail bridge over Muriel Avenue would be of conventional form and would be located higher than the existing rail bridges over Muriel Avenue.

The bridge at Muriel Avenue would add to the visual clutter at the intersection of Fairfield Road and Muriel Avenue by the addition of another overhead structure. The realigned on-ramp to the Ipswich Motorway would not change the nature of its immediate environment, which is essentially an area with an intense network of road and rail infrastructure.

Noise barriers would be visible within this area. In detailed design, refinements to noise barriers may be undertaken and mitigation measures explored to reduce their overall visibility.

Salisbury



Description of target area: The target area is the rail corridor, including Salisbury Station, through the suburb of Salisbury. The rail corridor in this location traverses through a mix of industrial, residential and open space uses.

Existing visibility of target area: The potential visual catchment for the target area is limited to areas of low relief in close proximity to the target site. Due to the urbanised nature of land surrounding the target site and the low relief of the terrain, viewing obstruction would be likely to limit views from anywhere but the immediate vicinity of the target site. Views of the target area from Beaudesert Road, Beaudesert Road Service Road, Railway Parade, Dollis Street, Frewin Street, Blackwood Road, Lillian Avenue and Olivia Avenue, are possible.

The photo above is from the entrance to Nyanda State High School on Fairlie Terrace looking towards the rail corridor and the Beaudesert Road overpass.

Project works: Project works in this location include additional surface tracks, a new pedestrian overpass at Fairlie Terrace and Heaton Street near Nyanda State High School and noise barriers. Works would also be undertaken to extend the footbridge over Salisbury station over the new surface tracks.

Project visibility: The majority of works in this section of the Project would occur in areas that exhibit typical light industry and rail infrastructure visual environments. The most visually prominent component of the Project within this area would be the resumption of light industry land for the widening of the rail corridor. This may create open areas that would permit residents to access views of the rail corridor.

Noise barriers would be visible within this area. In detailed design, refinements to noise barriers may be undertaken and mitigation measures explored to reduce their overall visibility.

10.3.4 Visual assessment – representative views

The following section assesses the representative views considered most sensitive in relation to their proximity to residential areas. A full list of representative views assessed for the Project are provided in **Appendix F Visual Amenity and Lighting**. Each view was characterised according to the descriptions outlined in **Table 10-7**.

Table 10-7 Description of impact significance

Impact significance level	Description
Negligible	A negligible modification in the quality of a view of low, medium or high sensitivity.
Low adverse	A small reduction in the quality of a view of moderate sensitivity or a small or moderate reduction in the quality of a view of low sensitivity.
Moderate adverse	A moderate reduction in the quality of a view of moderate sensitivity or a large reduction of a view of low sensitivity.
High adverse	A small, moderate or large reduction in the quality of a view of high sensitivity or a large reduction in the quality of a view of moderate sensitivity.
Low beneficial	A small improvement in the quality of a view of moderate sensitivity or a small to moderate improvement in the quality of a view of low sensitivity.
Moderate beneficial	A moderate improvement in the quality of a view of moderate sensitivity or a large improvement to the quality of a view of low sensitivity.
High beneficial	Any improvement to the quality of a view of high sensitivity or a large improvement to the quality of a view of moderate

Those views considered to be most sensitive from a community viewpoint include:

- station access in Alice Street, adjacent to the City Botanic Gardens
- ventilation and emergency access building at Fairfield Road, Fairfield
- Green Street at Yeerongpilly, due to the location of the new Yeerongpilly Station.

These views are shown on **Table 10-8**, **Table 10-9** and **Table 10-10**.

Table 10-8 View of Alice Street, corner of Albert Street

	
Distance to Project	Approximately 40 m to lift well and escalator adjacent to City Botanic Gardens.
Nature of existing view	This view is from the corner of Albert and Alice streets to the north-east. The view comprises the entrance to the City Botanic Gardens (at right) and the leafy edge produced by mature trees, including figs along the Alice Street frontage of the gardens. This differs to the opposite side of the street which is occupied by typical inner city built form.

Visual sensitivity	The viewing area is heavily trafficked by vehicles and pedestrians on a daily basis, the latter including local residents, workers, students, tourists and people seeking recreational activities. The City Botanic Gardens are culturally significant to Brisbane and entrances to the gardens contribute to that significance. The regional importance of the City Botanic Gardens and their role in the role as an attraction for the city's inhabitants and visitors contributes to a high sensitivity associated with this view.
Visual modification	Within the view, there would be a locally confined, but visually significant modification within the verge adjacent to the City Botanic Gardens, to the north of the entrance. An elevator shaft and escalator are to be installed in this area by the Project as an access point to the Albert Street Station. Visual modification is considered to be moderate to high due to its relatively small size, but its prominence in this locale.
Visual impact	The resulting impact to the view is likely to be high adverse due to the sensitivity associated with the view and the prominence of the modification. Visual impacts of the elevator and handrails of the escalator would depend to some extent on the materials and lightness of structure used in their construction.

Table 10-9 Bledisloe Street, Fairfield

	
Distance to Project	Approximately 100 m to location of realigned Railway Road.
Nature of existing view	This viewpoint is located at the intersection of Bledisloe Street and Cross Street looking east along Bledisloe Street towards Fairfield Road and Railway Road. The view comprises a residential street that is lined with low density properties and a number of street plantings. At the termination of the street the intersection with Fairfield Road and the commercial properties on the western side of Fairfield Road are visible. Part of an Energex substation is visible from this location. The substation, which is light industrial in nature, is a visually prominent feature within the primarily residential environment.
Visual sensitivity	The view is mainly experienced by residents entering or leaving properties or travellers along Bledisloe Street or Cross Street. Sensitivity associated with the view in this location is deemed to be moderate and locally significant.
Visual modification	Loss of vegetation due to the construction works within the greenspace between Railway Road and Fairfield Road and the realignment of Railway Road would produce a substantial modification of the view. Undertaking construction activities on the scale proposed would conflict with the low-density residential nature of the immediate area, resulting in a moderate to large detrimental modification of visual amenity. However, these amenity impacts are offset somewhat by the nearby presence of the substation and Fairfield Road. In the longer term, the primary modification would be from the imposition in the landscape of the ventilation outlet within this location. Permanent modifications are considered to be moderate to large with a moderate decline in visual amenity.

Visual impact	Impacts arising from the loss of vegetation, the realignment of Railway Road and the establishment of the worksite during construction are considered to be moderately to highly adverse. In the longer term, impacts on the view of the permanent presence of the ventilation outlet are also considered to be moderately to highly adverse, but would be partially mitigated by an architectural finish and reinstatement of vegetation within available greenspace.
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Table 10-10 Green Street, Yeerongpilly

	
Distance to Project	Approximately 200 m to Wilkie Street.
Nature of view	This viewpoint is located on the corner of Green Street and Biarra Street looking west down Green Street. The local residences are primarily of a 'timber and tin' character. The existing streetscape has high visual amenity with established vegetation typified by the mixed species subtropical street tree planting. Distant views of the existing station buildings can be seen at the end of the street and in the terminating view is of a high density residential building adjacent to the Queensland Tennis Centre. In particular, the recently constructed structure associated with the pedestrian footbridge over the rail line and Fairfield Road is visually prominent.
Visual sensitivity	This view is experienced mainly by local residents and is likely to be appreciated at the neighbourhood level. Sensitivity associated with this view is considered to be moderate.
Visual modification	The Project works in this area consist of the realignment of Wilkie Street and extension of the pedestrian overpass. The loss of residences and vegetation from the realignment of Wilkie Street would produce a moderate modification of the view with some decline in visual amenity as seen from this viewpoint. Once the Project is operational, the existing station would be decommissioned.
Visual impact	During construction the impact to the view at this viewpoint is considered to be moderately adverse due to the proposed nature of the construction buildings to be established. Once operational, few Project components would be visible from this viewpoint and as such would have a negligible impact. The realigned Wilkie Street would appear slightly closer to the viewpoint and fewer cars may park within the street as the station would be located further south. It is proposed that the existing station would be decommissioned once the new station is operational. If decommissioning includes removal of the station building, impacts may be experienced. Removal would provide for more expansive views to the high density residential development to the west while also resulting in the loss of the station as a landmark view from this location, resulting in a low adverse impact.

10.3.5 Impacts of Project lighting

This section provides an overview of the potential lighting requirements for the Project and the impacts on sensitive receptors that could be experienced during construction and operation. Further analysis of the impacts from Project lighting would be undertaken during the detailed design phase.

Construction

During the construction phase of the Project, night lighting would be required at a number of locations throughout the corridor. Lighting for the Project would be required for any night time activities that may be undertaken within the work sites and for personal and property safety.

All the Project's worksites would require security lighting appropriate to ensure the safety and security of personnel and property. Rather than providing security lighting across the entire site, it would be provided at specific locations that would act to deter criminal activities. Specific areas that would require security lighting include:

- entrances and exits to work sites, sheds and buildings
- equipment and plant storage areas
- particular areas of potential concealment, such as behind buildings or in the corners of the work sites.

In addition to security lighting requirements, lighting would be required in the event that night time construction activities are to be undertaken. While most night time construction activities would be undertaken under ground or within the confines of the acoustic sheds, some works may be required to be undertaken at night to minimise impacts to existing rail and road transport networks. These works would require external lighting.

Some lighting generated at external locations within the works sites would be visible from nearby sensitive receptor locations. Although lighting would be focussed over the particular points of interest within the sites, some light trespass would be likely. Depending on the activities to be undertaken and the worksites' proximity to sensitive receptors, some sites are likely to have a greater potential impact than others.

External construction lighting requirements at the southern Albert Street Station worksite would need to be considerate of its proximity to the City Botanic Gardens and the fauna species that may be located within it. However, as the City Botanic Gardens are located within the Brisbane CBD, it is likely that lighting on the Gardens from the Project would be similar to existing levels.

The Yeerongpilly worksite would be located immediately adjacent to the residential properties on Livingstone Street, Bow Street, Wilkie Street and Park Lane. While night time security lighting would be similar to what is currently used within the existing industrial precinct, some additional light trespass into residential properties may be experienced if night time construction activities are to be undertaken.

Construction lighting near active rail and road corridors would need to be considerate of operational signal lighting. The use of lighting that impedes the effective operating purpose of signal lights for rail or roads could result in implications to train or traffic movements.

Lighting on construction traffic entering and exiting work sites may generate impacts on sensitive receptor locations that front onto construction traffic routes. Residential properties with limited visual barriers to the roadway, such as high fences or vegetation, could be susceptible to light glare from passing vehicles. This impact could be further compounded on residential properties located on T-intersections that may be subjected to direct glare from vehicle headlights.

Operation

Once operational, the Project's lighting requirements would be similar to existing lighting requirements on Brisbane's rail network. Lighting impacts would not be experienced in those areas where the Project is in tunnel, apart from those areas around stations or the ventilation and emergency access building. Generally, light would be provided to improve amenity and safety and would be consistent within the urban environment.

Lighting along surface tracks would be minimal and would be in line with current Queensland Rail lighting requirements for above ground tracks. Due to the low lighting requirements, it is unlikely that the additional surface tracks provided north of the northern portal and south of the southern portal would generate light impacts on sensitive receptors. However, the increased frequency of trains operating on the network as a result of the Project may increase light impacts associated with train operations.

Surface stations would be lit as per the requirements of the *Disability Discrimination Act 1992* and Queensland Rail standards. Similar to existing surface stations, lighting would be required to illuminate platform, mezzanine, concourse and entrance areas to ensure safe and equitable access from the station entrance to the train. In coordination with other security measures, lighting would also be used as a deterrent to crime. Some light trespass and glare may be experienced at sensitive receptors located near to the surface stations.

The external lighting for the underground stations would primarily be required to provide safe and equitable access into the stations. Due to the nature of the substantially illuminated environments where these stations would be located, it is unlikely that the entrance lighting would present any additional impacts. As these stations are proposed to provide the architectural identity for Cross River Rail, illumination of the architectural components of the stations is proposed. While this feature lighting would be focussed on the relevant architectural components, there is potential that light glare and trespass may impact on nearby sensitive receptors. In particular, if the lights are focussed upwards to highlight the proposed ceilings of the station entrances in Albert Street, light glare and trespass may impact on residents within the adjacent residential towers.

10.4 Mitigation measures

This section provides an outline of recommended mitigation measures to manage or avoid potential impacts on the visual and landscape environment. These are in addition to the urban design treatments, streetscape improvements and other measures included as part of the reference design. Mitigation measures are also identified to manage or avoid potential impacts of lighting from construction and operation.

10.4.1 Visual and landscape

A range of mitigation measures are recommended for the construction and operation phase of the Project to avoid or minimise potential visual and landscape impacts.

Construction

Proposed construction works would be temporary in nature, but would impact on the existing visual and landscape environment through clearing of vegetation for worksites, demolition of buildings and structures, use of open space areas for construction activities, provision of noise barriers and hoardings around worksites and other work areas.

Mitigation measures proposed to avoid or minimise potential impacts on the visual and landscape environment of construction include:

- worksites at Victoria Park, Roma Street and Fairfield should be designed and located to minimise potential impacts on the landscape amenity of open space and park areas, including the need to clear vegetation
- a visual mitigation plan should be prepared prior to construction to mitigate potential visual impacts of noise barriers and hoardings, where appropriate
- revegetate, rehabilitate and enhance open space areas disturbed or damaged by construction works as soon as practicable following construction
- construction works in the vicinity of Moolabin Creek and Rocky Waterholes Creek should minimise potential impacts on the landscape values of these areas
- where appropriate, compensatory plantings should be undertaken to replace vegetation removed for the Project.

Operation

Mitigation measures proposed to avoid or manage potential impacts on the visual and landscape environment during operation of the Project include:

- noise barriers should be designed to reduce potential visual impacts from surrounding properties and roadways by:
 - incorporating high quality materials and urban design and landscape treatments, including where appropriate, landscape elements such as low, massed plantings
 - allowing, where appropriate, more expansive views, including maintaining existing views beyond the rail corridor, through the use of clear or transparent materials panelling
 - maintaining existing breezes
- provide enhanced landscape and streetscape amenity on those streets connecting to stations
- soften the visual impact of Project elements, such as the stations, the ventilation and emergency access building and the rail viaduct at Clapham Rail Yard, through the use of landscaping, including where appropriate, landmark trees and massed low plantings
- investigate opportunities to provide appropriately designed property fencing and streetscape works to improve passive surveillance along Wilkie Street
- ensure urban design treatments are consistent with and respect the character and amenity of the surrounding area, particularly near residential neighbourhoods at Yeerongpilly
- investigate appropriate screening for the viaduct in Mayne Rail Yard that achieves the necessary safety requirements of rail and road operations between the viaduct and the ICB, but which minimise the loss of views from the ICB.

10.4.2 Lighting

As it is within an urban environment and surface works would be along the rail corridor and major roads, it is unlikely that mitigation measures would completely remove the presence of night lighting on sensitive receptors as a result of the Project's construction and operational night lighting requirements. However, through the implementation of efficient lighting strategies, potential light nuisances could be manageable.

Construction

The mitigation measures outlined in **Table 10-11** address potential lighting issues associated with the construction of the Project.

Table 10-11 Construction lighting issues mitigation measures

Issue	Location	Mitigation measure
Disturbance to sensitive receptors as a result of security lighting.	Project worksites	Implement the use of directionally-controlled, shielded lights that are mounted at a sufficient height to allow the light to be focussed appropriately on the target and to minimise light spill. Where feasible, in coordination with noise attenuation measures, implement opaque or timber construction noise barriers where light spill from Project elements would be prominent. Use lights with a low wattage. Lighting to adhere to the requirements of AS4282.
Disturbance to sensitive receptors as a result of night time construction activities.	Project worksites	Implement the use of directionally-controlled lights that are mounted at a sufficient height to allow the light to be focussed appropriately on the target and to minimise light spill. Where possible, minimise external night time construction activities within the work sites. In coordination with noise attenuation measures, implement opaque or timber construction noise barriers where light spill from Project elements would be prominent. Lighting to adhere to the requirements of AS4282.
Disturbance to sensitive receptors as a result of night time construction traffic movement.	Transport routes to Project worksites	Where possible, minimise night time construction traffic movement. Where possible, use access routes that avoid local roads that are fronted by sensitive receptors.
Lighting conflicts with road and rail signalling and users.	Worksites near to existing rail operations.	Lighting systems should be implemented through consultation with the relevant road or rail authorities. Implement the use of directionally-controlled lights that are mounted at a sufficient height to allow the light to be focussed appropriately on the target and to minimise light spill. Implement light barriers between the Project and adjacent road corridors.

Operation

The mitigation measures outlined in **Table 10-12** address potential lighting issues associated with the operation of the Project.

Table 10-12 Operation lighting issues mitigation measures

Issue	Location	Mitigation measure
Disturbance to sensitive receptors as a result of security lighting.	Project stations and service facilities.	Implement the use of directionally-controlled lights that are mounted at a sufficient height to allow the light to be focussed appropriately on the target and to minimise light spill. Where feasible, in coordination with noise attenuation measures, implement opaque or timber noise barriers where light spill from Project elements would be prominent. Use lights with a low wattage. Lighting to adhere to the requirements of AS4282.
Lighting conflicts with road and rail signalling and users.	Road and rail corridors that are in close proximity.	Lighting systems should be implemented through consultation with the relevant road or rail authorities. Implement the use of directionally-controlled lights that are mounted at a sufficient height to allow the light to be focussed appropriately on the target and to minimise light spill. Implement light barriers between the Project and adjacent road corridors.
Disturbance to sensitive receptors as a result of night time feature lighting at stations.	Project stations	Implement the use of directionally-controlled lights to allow the light to be focussed appropriately on the target and to minimise light spill. Lighting to adhere to the requirements of AS4282.

10.5 Conclusion

Views of the Project would be possible within the visual environment. Depending on the location of the individual components of the Project within the study corridor, varying impacts to visual amenity would be experienced.

During construction, the Project's work sites and associated activities would be visible. Generally, these views would be accommodated within the urban environment at Mayne Rail Yard, Roma Street, Albert Street, Woolloongabba, Boggo Road Urban Village, Clapham Rail Yard and Moorooka Station, Rocklea and Salisbury. Some temporary impacts to the visual environment would be experienced within the RNA Showgrounds, Victoria Park, Fairfield and Yeerongpilly. However, as the RNA Showgrounds are to be redeveloped, views of construction activities for the Project would be consistent with the activities to be undertaken within this location.

Views of construction activities would be minimised through the implementation of noise barriers, hoardings and acoustic sheds. While these features would, themselves, be visually prominent, they would reduce the overall visibility of the proposed activities.

Lighting for construction activities would be required for safety and night time activities. Where feasible, the lighting would be focussed at their intended targets and would be shielded to minimise light trespass onto nearby sensitive receptors.

Once operational, the Project's surface components would be visible and generally considered appropriate within the urban environment. The design guidelines provide for the design of the Project in a way that ensures that it is consistent with the surrounding visual environment, is visually appealing and provides for a safe and equitable environment. Mitigation measures, such as tree screening, would be implemented where urban design treatments are inappropriate or would not improve the visual impact of the Project component.

Operational lighting would be required to provide safe and equitable environments within and around the Project's stations, including car parks. Where feasible, the lighting would be focussed at their intended targets and would be shielded to minimise light trespass onto nearby sensitive receptors. Feature lighting would be provided to highlight key urban design treatments at prominent stations. This lighting would be focussed on the target areas and would be considerate of nearby sensitive receptors.