IRIS Visual Planning + Design

Transport Access Program

Warrawee Station

Landscape & Visual Impact Assessment

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Warrawee Station Transport Access Program Visual Impact Assessment

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Abbreviations

Term	Meaning
CBD	Central Business District
CCTV	Closed Circuit TV
CPTED	Crime Prevention Through Environmental Design
DSAPT	*Disability Standards for Accessible Public Transport 2002*
OHLE	Overhead line equipment
TGSI	Tactile tiles or Tactile Ground Surface Indicators

Definitions

Term	Meaning
Concept design	The concept design is the preliminary design presented in this REF, which would be refined by the Contractor (should the Proposal proceed) to a design suitable for construction (subject to TfNSW acceptance).
Detailed design	Detailed design broadly refers to the process that the Contractor undertakes (should the Proposal proceed) to refine the concept design to a design suitable for construction (subject to TfNSW acceptance).
Disability Standards for Accessible Public Transport	The Commonwealth *Disability Standards for Accessible Public Transport 2002* ("Transport Standards") (as amended) are a set of legally enforceable standards, authorised under the Commonwealth *Disability Discrimination Act 1992* (DDA) for the purpose of removing discrimination 'as far as possible' against people with disabilities. The Transport Standards cover premises, infrastructure and conveyances, and apply to public transport operators and premises providers.
Out of hours works	Defined as works outside standard construction hours (i.e. outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays).
Overhead line equipment	A system of masts and overhead wires used to supply electricity to trains.
Rail possession	Possession is the term used by railway building/maintenance contractors to indicate that they have taken possession of the track (usually a block of track) for a specified period, so that no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users.
Sensitive receivers	Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals.
The Proposal	The construction and operation of the Warrawee Station transport access upgrade.
Zincalume	Aluminium-Zinc coated sheet steel

1.0 Introduction

IRIS Visual Planning + Design were commissioned by Transport for NSW to undertake an assessment of the visual impact of a proposed accessibility upgrade at Warrawee Station. Warrawee Station is located on the North Shore line, served by the T1 North Shore Line, providing connections to the suburban Sydney Trains Network. The station is within the Ku-ring-gai Council local government area, about 17 kilometres north-west of the Sydney CBD. This visual impact assessment has been prepared to inform the Review of Environmental Factors (REF) for the Proposal.

Warrawee Station has been identified for inclusion in the Transport Access Program for a precinct accessibility upgrade as it currently does not accommodate mobility impaired access to rail services, or meet key requirements of the *Disability Standards for Accessible Public Transport 2002* (DSAPT) or the Commonwealth *Disability Discrimination Act 1992* (DDA).

The proposed upgrade would improve the station entrance via the existing overbridge with a new lift and landing, a new platform-level canopy from the lift to the existing canopy along platform 1 and upgrade of the existing stairs and platform surfaces. Other proposed improvements include internal station building works, new accessible car parking spaces, kiss-and-ride bays along Warrawee Avenue, a paved area at the station entrance, new landscaping/planting within the station precinct and other associated public realm improvements.

Objectives of the Transport Access Program

The Transport Access Program is an initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure. Key benefits include:

- Stations that are accessible to people with a disability, limited mobility, parents/carers with prams and customers with luggage
- Modern buildings and facilities for all modes that meet the needs of a growing population
- Modern interchanges that support an integrated network and allow seamless transfers between all modes for all customers.

Study scope

This visual impact assessment identifies the potential visual impacts of the Proposal on views to the station from surrounding areas. The study area for this Proposal generally extends from Millewa Avenue in the north, east to Warrawee Avenue, south to Brentwood Avenue, and west to Borambil Street.

This assessment is based upon a viewpoint assessment, identifying and assessing views that represent the range of publicly accessible views to the Proposal. This assessment includes views from surrounding commercial areas, footpaths and streets, parks, and Warrawee Station.

This assessment begins with the identification of:

- the existing character of the station precinct;
- a description of the visual character of the Proposal; and
- an individual viewpoint assessment.

The viewpoint assessment includes identifying the sensitivity of the view and the magnitude of change that is proposed. These factors are then combined to determine a level of impact.

The assessment has identified the impacts of the Proposal during the day and night, and throughout construction and operation. In particular, this assessment considers the visual impacts created by the Proposal as seen within the context of the local heritage listed buildings from a landscape character perspective. Detailed consideration of potential heritage impacts have been addressed separately as part of the REF in the *Warrawee Railway Station Statement of Heritage Impact* (Artefact, 2019).

The assessment also considers the urban design and landscape impacts of the Proposal in terms of its consistency with requirements of the *Ku-ring-gai Development Control Plan*, which covers issues such as tree removal and landscape design.

This assessment is based on Concept Drawings prepared by Design Inc., Architectural plans, elevations, sections and artists impressions, dated 20/12/2018.

2.0 Station location and description

Warrawee Station consists of a single island with two platforms, and tracks on each side. Platform 1 is the south bound platform providing services to Sydney CBD. Platform 2 is the north bound service, providing trains to the northern suburbs (refer Figure 3-1). The platform building (c. 1909) is of local heritage significance and features a decorative red-brick façade and corrugated iron roofing.

The station platform is currently accessed by an overbridge at the southern end of the station, extending between Heydon Avenue and Hastings Road. The platform is accessed via covered stairs connecting to the overbridge. There is currently no lift access.

A pathway along the western side of the overbridge connects the station to surrounding residential areas and Knox Grammar School, via a bushland reserve. The station is serviced by a small commuter car park at Heydon Avenue, adjacent to a reserve.

Dense tracts of mature native trees are a common landscape feature along the rail corridor.

Figure 3-1 Site location

3.0 The Proposal

Proposal components

The Proposal involves an upgrade of Warrawee Station as part of the Transport Access Program which would improve accessibility and amenity for customers. The Proposal would include the following key elements:

- construction of a new lift and landing to provide access between the existing pedestrian bridge and the platforms
- upgrade of the existing stairs to include new compliant handrails, tactile ground surface indicators (TGSIs), nosings and anti-throw screens
- construction of a new platform canopy from the lift to the existing canopy
- internal station building works including:
    - reconfiguration of the existing male and female toilets within the station building to accommodate:
        - a new family accessible toilet
        - a new unisex ambulant toilet
    - other minor building modifications required to accommodate new electrical equipment including a main switchboard, and new or upgraded station communications equipment
- parking, kiss-and-ride, and pedestrian works including:
    - provision of two new accessible car parking spaces and one kiss-and-ride space along Heydon Avenue
    - provision of three new kiss-and-ride spaces along Warrawee Avenue
    - provision of a paved area and associated kerb ramp works at both the Heydon Avenue and Warrawee Avenue entrances
    - removal of existing bollards and replacement of a single bollard at the Heydon Avenue and Warrawee Avenue entrances
- upgrade of the existing platform surfaces (re-grading/re-surfacing) across the platform to provide compliant accessible paths and ramps to station amenities
- landscaping/planting within the station precinct
- electrical upgrades including a new transformer (to be installed on rail land near Warrawee Avenue). A new service pole would also be required to take the existing electricity supply to the transformer and undergrounding of the 11kv cable from the service pole to transformer.
- ancillary works including adjustments to lighting, electronic ticketing, relocation or replacement of existing customer facilities (drinking fountain, vending machine, seating, telephone booth), improvement to station communications (including CCTV cameras), hearing loops, wayfinding signage and painting of yellow lines.

Figure 4-1 shows the general layout of key elements for the Proposal.

Construction of the proposed works is expected to be completed in 2020.

One mature tree would be removed on the station platform to install the new lift. Options for the provision of a replacement tree would be investigated with Sydney Trains. Four trees would also be removed on Warrawee Avenue.

Figure 4-1 View north along the station platform

Figure 4-2 View north along the station platform, artists impression

Figure 4-3 View to footbridge entry at Heydon Avenue

Figure 4-4 View to footbridge entry at Heydon Avenue, photomontage

Materials and finishes

Materials and finishes for the Proposal have been selected to accord with heritage requirements, to minimise visual impacts, to be aesthetically pleasing, and to satisfy durability/maintenance requirements and cost effectiveness. They will also consider life cycle impacts. The life cycle impacts of a material is calculated by looking at the environmental impacts of materials from the point of extraction, through to transportation, use, operation and end of life.

Each of the upgraded or new facilities would be constructed from a range of different materials, with a different palette for each architectural element.

Subject to detailed design, the Proposal would include the following key materials:

- lift – solid base to lift shaft with painted steel and glass infill panels
- lift car –stainless steel and glass doors
- lift landing – flooring to match the adjacent pedestrian bridge
- new canopy – steel frame and cladding
- upgraded stairs – replace non-compliant handrails, nosing and TGSIs on existing stairs
- regraded platform surface – to achieve compliance
- anti-climb screens to existing stairs.

Construction

A temporary construction compound would be required to accommodate a site office, amenities, laydown and storage area for materials. An area for a construction compound has been proposed on the vacant land that was previously used for the TfNSW Warrawee Substation Project.

This area of land is located between the rail corridor and Warrawee Avenue and from the pedestrian footbridge to Brentwood Avenue. Access to the proposed construction compound would be via existing gates on Warrawee Avenue or Brentwood Avenue (refer Figure 4-6).

An additional temporary laydown area may be located on Heydon Avenue within the existing car parking spaces near the station entrance

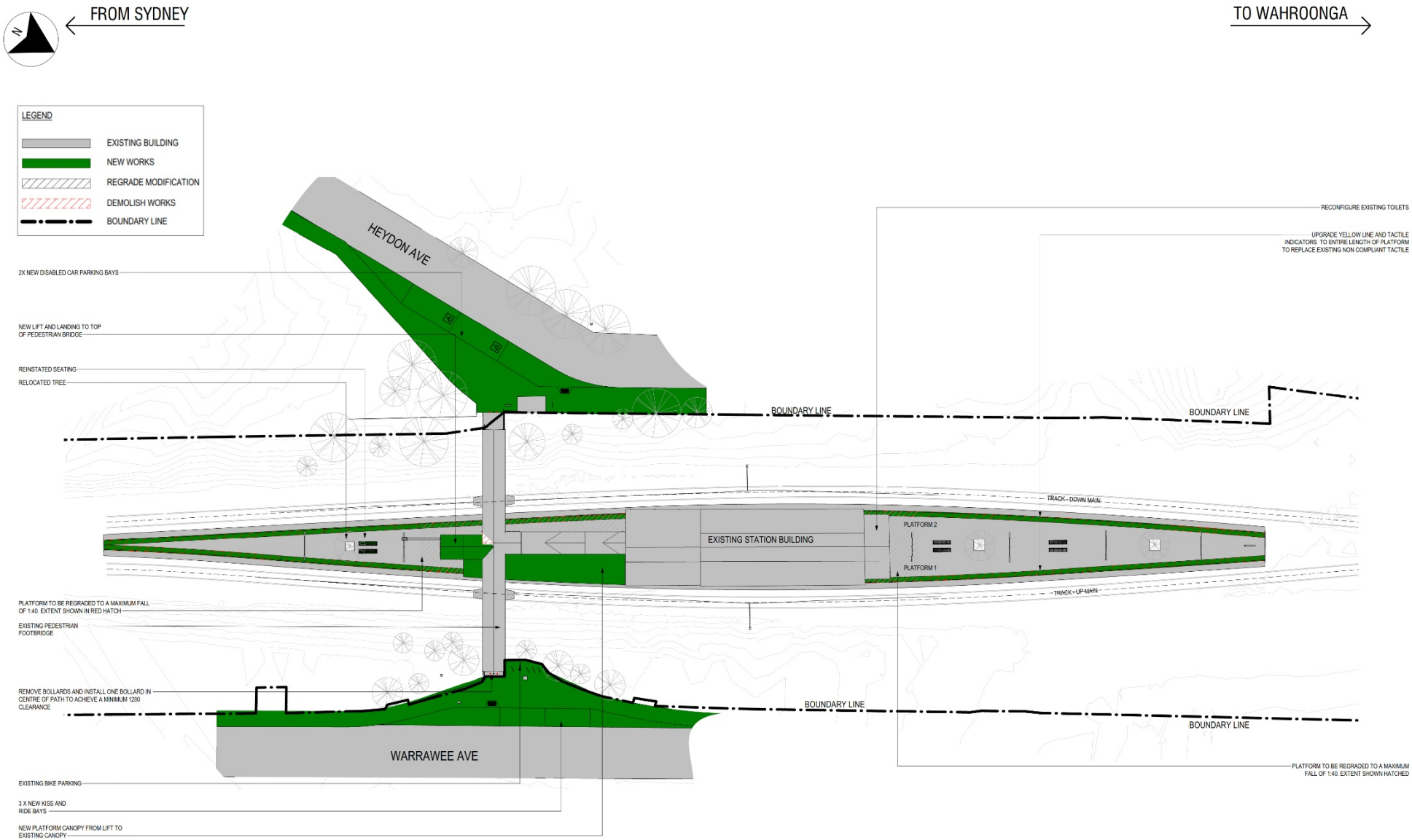

Figure 4-5 Key features of the Proposal (Indicative only, subject to detailed design)

Figure 4-6 Proposed construction compound area

The works would be undertaken over a program of approximately 12 months. The station would remain operational for the duration of the works (outside of scheduled track possessions), with customer accessible areas maintained around the construction works.

While some footpath widths may be reduced, with the exception of scheduled track possessions, it is not expected that customer access to the station platforms would be restricted or closed during construction.

The concourse and platform work areas and main construction compound would be enclosed in

temporary security fencing and hoarding. The machinery and activities occurring in these areas would include excavators, cranes, heavy and light delivery vehicles, concrete trucks and pumps, and other typical construction equipment.

The majority of works required for the Proposal would be undertaken during standard (NSW) Environment Protection Authority (EPA) construction hours, which are as follows:

- 7.00 am to 6.00 pm Monday to Friday
- 8.00 am to 1.00 pm Saturdays
- no work on Sundays or public holidays.

Certain works may need to occur outside standard hours and would include night works and works during routine rail possessions which are scheduled closures that would occur regardless of the Proposal when part of the rail network is temporarily closed and trains are not operating.

4.0 Planning context

There are several state and local government planning documents which provide relevant guidance for the landscape character and visual values of the site.

State and regional government planning context

Greater Sydney Regional Plan: A Metropolis of Three Cities, 2018

This plan (NSW Greater Sydney Commission, 2018b) sets a 40-year vision (to 2056) and establishes a 20-year plan to manage growth and change for Greater Sydney in the context of social, economic and environmental matters. It identifies several '*cities'* and '*districts'*, including '*Central City*', '*Eastern City*' and '*Western City*', and the '*North*' and '*South*' districts (p.25). These cities and districts are used in the plan co-ordinate a whole-of-government approach to provide the appropriate infrastructure in the right places in Greater Sydney. The proposed Warrawee Station project is located in the North district.

The region's '*green infrastructure*' including '*urban tree canopy, green ground cover, bushland, waterways, parks and open spaces*' (p.6) are valued assets in Greater Sydney. A target has been set to '*increase tree canopy cover to 40 per cent, up from the current 23 per cent*' (Strategy 30.1, p.164). The scenic value of landscape is also valued in the plan, including waterways, urban bushland; urban tree canopy and green ground cover; parks and open spaces, which '*create a sense of identity*' (p.159). Strategy 28.2 aims to '*enhance and protect views of scenic and cultural landscapes from the public realm*'.

North District Plan, 2018

This plan is focused on the North District, covering Sydney's northern suburbs, including the proposed Warrawee Station Proposal site. It is a 20-year plan to manage growth in the context of economic, social and environmental matters to achieve the 40-year vision for Greater Sydney. It contains the planning priorities and actions for implementing the *Greater Sydney Region Plan, A Metropolis of Three Cities*, at a district level and is a bridge between regional and local planning.

Whilst Warrawee Station is identified in the plan, the nearest '*local centre*' is located at Hornsby in the north and Turramurra to the south (p.11). The plan advocates a '*place-based planning and design excellence that builds on local strengths and focuses on public places and open spaces'*, including improvements to public realm and infrastructure (p.25).

A key priority of the plan is: '*Protecting and enhancing scenic and cultural landscapes*' (p.105). Bushland areas, such as the reserve west of the station, are considered to be … '*important landscapes in the District'* (p.105). Another key priority is: '*Increasing urban tree canopy cover and delivering Green Grid connections*'. The district's tree-lined streets, bushland corridors, and parks and open spaces are recognised as '*high quality green spaces*' (p.105). The Proposal is located along the north shore line rail corridor, identified as an '*Other Green Grid Opportunity'* (p.111).

Transport for NSW

The NSW Government is committed to the development of a customer focused transport network to help it achieve its economic, social and environmental objectives. Good urban design can help achieve the NSW Government's aims for the rail systems of NSW. The urban design principles contained in these documents explain how it applies to specific elements of rail infrastructure and the precincts around them.

These documents include:

- *Around the Tracks: Urban Design for Heavy and Light Rail*
- *Managing Heritage: issues in rail projects guidelines*
- *Creativity Guidelines: for transport systems*
- *Commuter Car Parks: urban design guidelines*
- *Sustainable design guidelines, Version 4.0*

The *Sustainable design guidelines* refers to eight principles, drawn from the Interim version of the Urban Design best practice guideline *Around the Tracks Urban Design for Heavy and Light Rail.* These principles are:

1. *Draw on a comprehensive site and context analysis to inform the design direction.*
2. *Provide value-for-money design solutions that achieve high quality low maintenance architectural and urban design outcomes that have longevity.*
3. *Provide connectivity and permeability for pedestrians.*
4. *Integrate the project with the surrounding area.*
5. *Maximise the amenity of the public domain.*
6. *Protect and enhance heritage features and significant trees.*
7. *Maximise positive view opportunities.*
8. *Design an efficient and functional transport solution which enhances and contributes to local amenity and prosperity.*

Projects are required to outline how they have addressed each of these principles at a minimum as part of their project Urban Design and Landscape Plan (UDLP).

The office of the NSW State Government

The office of the NSW State Government Architect has prepared a suite of documents under the title of '*Better Placed*' which aim to improve the urban design quality of places in NSW. These documents include:

- *Better Placed: An integrated design policy for the built environment of NSW*, State Government Architect NSW (2018)
- *Better Placed: Draft Good Urban Design Strategies for realising Better Placed objectives in the design of the built environment*, State Government Architect NSW (2018)
- *Better Methods: Evaluating Good Design, Implementing Better Placed design objectives into projects.* (2018).

These documents are intended to inform those involved in the design, planning, and development of the built environment in NSW. The overriding policy establishes the objectives and expectations in relation to design and creating good places.

The policy includes seven distinct objectives for the design of the built environment. These objectives apply to the design of landscapes, buildings and our public domain and aims for design which is *'healthy, responsive, integrated, and equitable.'*

The objectives are:

- Better fit – Contextual, local and of its place
- Better performance – Sustainable, adaptable and durable
- Better for community – Inclusive, connected, and diverse
- Better for people – Safe, comfortable and liveable
- Better working – Functional, efficient and fit for purpose
- Better value – Creating and adding value
- Better look and feel – Engaging, inviting and attractive.

These objectives are expanded upon in the Strategy and Evaluation documents.

The '*Better methods'* draft working paper lists requirements that can be used as criteria for evaluating a project. These criteria are based upon the seven design objectives from the Better Placed policy.

Local government planning context

The Proposal is located within the Ku-ring-gai Council area. Whilst not directly applicable to the Proposal, the provisions in the local *Ku-ring-gai Local Environmental Plan* (Ku-ring-gai Council, 2015b) and *Ku-ring-gai Development Control Plan* (Ku-ring-gai Council, 2015a) provide some guidance for evaluating the landscape and visual impacts of the Proposal. The relevant clauses from these documents are summarised in the following sections.

Ku-ring-gai Local Environmental Plan, 2015

The *Ku-ring-gai Local Environmental Plan 2015* (LEP) applies to land surrounding the station upgrade works. The relevant aims of this plan are to … '*protect, enhance and sustainably manage the … 'scenic values … of Ku-ring-gai for the benefit of current and future generations'* (cl 1.2.2b) and *'facilitate development that complements and enhances amenity for residential uses and public spaces* (cl 1.2.2l).

The LEP includes a number of plans which offer guidance for development within the study area including land use zoning, maximum heights for development and heritage areas.

Land use zoning

The study area includes a number of land use zones including:

- SP2 – Infrastructure (Railway)
- SP2 – Infrastructure (Educational Establishment)
- R2 – Low Density Residential
- RE1 – Public Recreation.

There are some objectives identified for these zones that are relevant to the visual amenity of the study area, these are listed in the following paragraphs.

Warrawee Station and the railway corridor are included in the SP2 (Railway) zone. Knox Grammar School is located west of the Proposal, zoned SP2 (Educational Establishment). The objectives of this zone relevant to this Proposal include:

'To provide for infrastructure and related uses' … and … *'To prevent development that is not compatible with or that may detract from the provision of infrastructure'*.

The Proposal is located within the established suburban areas of Warrawee, zoned R2 Low Density Residential. The objectives for the R2 zone relate to the provision of housing that is … '*compatible with the existing environmental and built character of Ku-ring-gai*'.

A small reserve (Warrawee Park) is located immediately west of the Proposal and contains mature trees paths and seating.

In areas surrounding the station to the west, the trees in the reserve, street trees and within private gardens overhanging the streets …

'*provide an urban forest character'* (Ku-ring-gai Council, 2015, Heritage Data Form).

A key objective of the Public Recreation (RE1) zone is: *'To protect and enhance the natural environment for recreational purposes'* whilst protecting, managing and restoring areas that contain '*aesthetic values'*.

Heights of buildings

Development in the low density residential areas to the east and west of the station is permitted to reach maximum building heights of 9.5 metres, reflecting the desire to maintain the existing, low density character of built form in these areas. The rail corridor, schools and public recreation zoned areas are not subject to a building height restriction under the LEP.

Heritage

Warrawee Station is listed on the Sydney Trains Section 170 Register as an item of local significance. It is also listed as a local heritage item on the *Ku-ring-gai Local Environmental Plan 2015*.

The station is located between two conservation areas, including 'Warrawee Conservation Area' (east of the track) and the 'Heydon Avenue, Warrawee and Woodville Avenue, Wahroonga Conservation Area' (west of the track).

Warrawee Heritage Conservation Area is of aesthetic significance for its '*remarkable concentration of architecturally distinguished houses set within fine landscaped garden settings on large sites*' (Ku-ring-gai Council, 2015b, Heritage Data Form).

The Heydon Avenue, Warrawee and Woodville Avenue, Wahroonga Conservation Area is a '*distinctive residential area of historical and aesthetic significance for its fine Federation and Inter-war period streetscapes*' (Ku-ring-gai Council, 2015b, Heritage Data Form).

Heritage items around the Proposal include four dwellings to the east of the track at 69 Hastings Road, and 1, 5 and 7 Warrawee Avenue (within Warrawee Conservation Area); and four dwellings to the west of the track at 17, 32 and 34 Heydon Avenue, and 2 Borambil Street (Heydon Avenue, Warrawee and Woodville Avenue, Wahroonga Conservation Area).

A key objective of the heritage conservation clause is '*to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views*' (s.5.10).

Design

The LEP has no clause setting out general urban design objectives or guidance on railway or station design. The LEP does not contain any requirements for the design of developments to deliver the highest standard of architectural, urban and landscape design, nor does it have requirements for the authority to consider whether the development detrimentally impacts on view corridors. Design guidance is set out in the DCP.

Ku-ring-gai Development Control Plan, 2015

A Development Control Plan (DCP) has been prepared for the Ku-ring-gai local government area to support the Ku-ring-gai LEP. Key objectives of the DCP are to: … '*Establish a future character for Ku-ring-gai, and ensure that development across the Local Government Area positively contributes to the existing character of the residential areas*' … and … '*Ensure buildings and other development have a good relationship with neighbouring developments, the public domain and the landscape qualities of the locality*' (clause 1A.5). The DCP also aims to '*Ensure the long term survival of Ku-ring-gai's native and exotic tree and vegetation cover*' (clause 1A.5).

The DCP supports the conservation of significant buildings, landscape elements, views and special places within the LGA that contribute to its heritage significance such as the heritage items, heritage conservation areas and their associated settings.

The DCP includes a Green Web plan, which identifies both remnant landscapes and remnant canopy trees in the vicinity of the site. Landscape remnants are identified in Warrawee Park, and along the footpath to the south-west of the station. Remnant canopy trees are located along the rail corridor near Warrawee Avenue and on Heydon Avenue.

Although the DCP contains no specific clauses or requirements relating to the design of public infrastructure such as railway buildings and structures, it places importance on the appearance and compatibility of development with the surrounding context, including:

Views and vistas:

- Development must consider the *'amenity of users of the subject site and the locality'* and '*ensure that the design response is well founded and responsive to site context'* (cl 2.1).
- The DCP also requires consideration of the '*key features of adjoining sites'*, including '*view lines*' (cl 2.1[5]).

Tree preservation:

- The aesthetic value of trees in providing a distinctive character to an area whilst visually softening the built environment and screening undesirable sights. It requires that any development site '*retain significant and visually prominent trees and vegetation that contributes to neighbourhood'* (cl 21.2[1ii]).

Landscape Design:

- The DCP also promotes quality landscape design solutions that respond to significant existing trees and natural features, relate to the building scale, and provide screening for visually obtrusive land uses or building elements (cl 21.2).
- On lots adjoining the rail corridor, the DCP also requires the design of landscaping to '*create a setting for the building by planting tall trees which contribute to the tree canopy*' (cl 21.3[3i]).

Heritage conservation:

- '*New development in the vicinity of a Heritage Item or HCA is to demonstrate that it will not reduce or impair important views to and from the Heritage Item from the public domain'* (cl 19F.1[4])

General building design:

Relevant requirements for materials and finishes include:

- *'Large, unbroken expanses of any single material and finish (rendered or not) to building facades must be avoided'* (cl 23.4[12])
- '*new development is to avoid extensive use of highly reflective or gloss materials on the exterior of buildings*' (cl 23.4[13])
- '*Natural earth tones are to be used on building facades in close proximity to bushland*' (cl 23.4[22]).

These requirements have been addressed in section 8 of this report, Urban Design and Landscape Character Assessment.

Ku-ring-gai Local Centres Development Control Plan

This document provides detailed guidance for the siting, design and assessment of new development on land surrounding Turramurra, Pymble, Gordon, Lindfield, Roseville stations and St Ives Village Green. As Warrawee (including the station Proposal site) is not identified as a 'local centre', the *Ku-ring-gai Local Centres Development Control Plan* is therefore not relevant.

5.0 Methodology

Guidance for visual assessment

While there are no specific legislative requirements for the methodology of an assessment such as this in New South Wales, the industry typically refers to the guidance offered by:

- *Guidance note EIA-N04 Guidelines for Landscape Character and Visual Impact Assessment*, NSW State Government, Roads and Maritime Services (2018)
- *The Guidance Note for Landscape and Visual Assessment* (GNLVA), Australian Institute of Landscape Architects Queensland (2018).

The methodology used for this assessment conforms generally with the direction offered by these guidelines.

This Visual Impact Assessment has identified potential visual impacts during construction and operations of the Proposal, day and night.

The process involved the identification of:

- existing visual conditions
- visual sensitivity
- magnitude of change
- visual impact
- mitigation opportunities.

The potential visual impacts have been classified according to the impact significance criteria set out in this methodology.

Identification of existing visual conditions

The key landscape features of the site have been identified, described and located on a site plan. (refer Figure 7-1).

A number of viewpoints have been selected to illustrate the visual influence of the Proposal. These views represent publicly accessible viewpoints from a range of locations and viewing situations. Particular attention was paid to views from places where viewers are expected to congregate such as the station and commercial areas, as well as views to and from heritage items.

Visual sensitivity

Visual sensitivity refers to the nature and duration of views. Locations from which a view would potentially be seen for a longer duration, where there are higher numbers of potential viewers and where visual amenity is important to viewers can be regarded as having a higher visual sensitivity. In addition, any views recognised by local, state or federal planning regulations would, by nature of their recognition in these documents, increase the sensitivity level of the view.

In order to ensure the assessment of impact is reasonable, the sensitivity of a viewpoint is considered in the broadest context of possible views, from those of national importance through to those considered to have a neighbourhood visual importance. For this reason, the following terminology is used to describe the level of visual sensitivity, see Table 6-1.

Table 6-1 Visual sensitivity levels

Visual sensitivity	Description
National	Heavily experienced view to a national icon, e.g. view to Sydney Opera House from Circular Quay or Lady Macquarie's Chair, view to Parliament House Canberra along Anzac Parade.
State	Heavily experienced view to a feature or landscape that is iconic to the State, e.g. view along the main avenue in Hyde Park.
Regional	Heavily experienced view to a feature or landscape that is iconic to a major portion of a city or a non-metropolitan region, or an important view from an area of regional open space, e.g. an identified view corridor to a state heritage listed item.
Local	High quality view experienced by concentrations of residents and/or local recreational users, local commercial areas, and/or large numbers of road or rail users, e.g. view to a local heritage listed items such as dwellings in Warrawee Conservation Area.
Neighbour-hood	Views where visual amenity is not particularly valued by the wider community such as views from local streets, pocket parks and small groups of residences.

Magnitude of change

Magnitude describes the extent of change resulting from the Proposal and the compatibility of these new elements with the surrounding landscape. There are some general principles which determine the magnitude of change; these include elements relating to the view itself such as distance, landform, backdrop, and contrast. There are also characteristics of the development itself which are: scale, form and line/alignment. Change can result in an improvement or reduction in visual amenity.

A high magnitude of change would result if the development contrasts strongly with the existing landscape. A low magnitude of change occurs if there is minimal visual contrast and a high level of integration of form, line, shape, pattern, colour or texture values between the development and the environment in which it is located.

In some circumstances, there may be a visible change to a view which does not alter the amenity of the view, this would be due to the visual absorption capacity of the surrounding landscape and / or the compatibility of the Proposal with the surrounding visual context. Table 6-2 lists the categories used to describe the magnitude of change.

Table 6-2 Magnitude levels

Magnitude	Description
Considerable reduction or improvement in visual amenity.	Substantial part of the view is altered. The Proposal contrasts substantially with surrounding landscape.
Minor reduction or improvement in visual amenity.	Alteration to the view is clearly visible. The Proposal contrasts with surrounding landscape.
No perceived reduction or improvement in visual amenity.	Either the view is unchanged or if it is, the change in the view is generally unlikely to be perceived by viewers. The Proposal does not contrast with the surrounding landscape.

Identifying night-time visual impacts

The assessment of night-time impacts has been undertaken with a similar methodology to the daytime assessment. However, rather than assessing particular viewpoints or landscape features, this assessment draws upon the guidance of the Institution of Lighting Engineers (UK), and their *'Guidance for the reduction of obtrusive light'* (2011). This guidance note

identifies environmental zones, useful for the categorising of night-time landscape settings.

These zones are:

- E0 / E1: Dark / Intrinsically dark landscapes – national parks, state forests etc.
- E2: Low district brightness areas – rural, small village, or relatively dark urban locations
- E3: Medium district brightness areas – small town centres or urban locations
- E4: High district brightness areas – town/city centres with high levels of night-time activity.

Specific features of the lit landscape can be described in terms of:

- sky glow – the brightening of the night sky
- glare – the uncomfortable brightness of a light source when viewed against a dark background
- light intrusion ('trespass') – the spilling of light beyond the boundary of the property or area being lit.

The level of impact on the precinct has been described according to the impact levels that are identified in Table 6-4. The precinct is considered to be an area of medium district brightness, as Warrawee Station and local centre are used at night and are brightly lit, surrounded by lights from residences, street lighting and vehicle headlights.

Assigning impact levels

An assessment of visual impact has been made on a range of representative viewpoints. An impact visual impact level has been determined by combining the sensitivity and magnitude level. The following criteria have been used, refer to Table 6-3.

Similarly, for the assessment of visual impacts at night, the following criteria has been applied. (Table 6-4).

Table 6-3 Visual impact levels

		Sensitivity				
		National sensitivity	State sensitivity	Regional sensitivity	Local sensitivity	Neighbourhood sensitivity
Magnitude	Considerable reduction	Very high adverse	Very high adverse	High adverse	Moderate adverse	Minor adverse
	Minor reduction	Very high adverse	High adverse	Moderate adverse	Minor adverse	Negligible
	No perceived change	Negligible	Negligible	Negligible	Negligible	Negligible
	Minor improvement	Very high benefit	High benefit	Moderate benefit	Minor benefit	Negligible
	Considerable improvement	Very high benefit	Very high benefit	High benefit	Moderate benefit	Minor benefit

Table 6-4 Night-time visual impact levels

		Sensitivity			
		E0/E1: Dark/ Intrinsically dark landscapes	E2: Low district brightness	E3: Medium district brightness	E4: High district brightness
Magnitude	Considerable reduction	Very high adverse	High adverse	Moderate adverse	Minor adverse
	Minor reduction	High adverse	Moderate adverse	Minor adverse	Negligible
	No perceived change	Negligible	Negligible	Negligible	Negligible
	Minor improvement	High beneficial	Moderate beneficial	Minor beneficial	Negligible
	Considerable improvement	Very high beneficial	High beneficial	Moderate beneficial	Minor beneficial

Mitigation measures

Following the identification of potential landscape and visual impacts opportunities for mitigation were identified. Measures include opportunities to avoid, reduce and manage potential adverse impacts during construction and operation of the Proposal.

Photomontages

Photomontages have been prepared to illustrate the massing and scale of the Proposal. These combine the architectural 3D model with photo editing techniques to create an artist's impression of the Proposal.

The photomontage locations were selected in consultation with TfNSW to illustrate a typical viewpoint toward the Proposal. The photomontages are located in publicly accessible area, looking towards the Proposal works.

Assessment of Urban Design and Landscape Character Impacts

Whilst the requirements of the LEP and DCP are not directly relevant to this approval, for the purposes of this assessment, impacts on urban design and landscape character have been undertaken with reference to the guidance provided in these documents. Specifically, the urban design and landscape character impacts will be assessed against the strategies identified in the *Ku-ring-gai LEP (2015).*

These requirements consider tree preservation, landscape design, legibility, compatibility of the design with adjacent uses, streetscape scale, overshadowing etc.

6.0 Assessment of visual impacts

Existing conditions

Warrawee Station is located within a cutting between Warrawee and Heydon Avenues. The landform descends gradually to the north, with the northern end of the platform generally level with Warrawee Avenue. A pedestrian footbridge spans the cutting at the southern end of the station between Warrawee and Heydon Avenues, with a covered staircase providing access to the platform and is level with the adjacent streets. This footbridge allows elevated views over the station.

A small commuter car park is located in Heydon Avenue, adjoining a local reserve. The dense concentration of mature trees in this reserve, as well as in the rail reserve, and street trees and mature garden tree canopies overhanging streets provide a strong sense of visual enclosure to the station and screen views to and from the adjacent residential areas of Warrawee.

Warrawee Station, particularly the platform and platform building, is a local landmark which '*contributes to the character of the North Shore line with its homogenous, early 20th century railway architecture and landscaped settings*' (NSW Heritage Register, 2009). The station consists of an island platform with heritage listed single storey station platform building (c. 1909), featuring a decorative red-brick façade and a gabled roof with timber bargeboards at either end of the building. The footbridge (c.1977), stairs and both the north and south ends of the platform building feature a recent steel framed gable roof, which is a unifying feature of the station. Unlike other stations on this line however, '*it does not have its original footbridge or any landscaping of particular note*' (NSW Heritage Register, 2009).

The existing platform entry stairs are located at the southern end of the station, on the northern side of the overbridge. The overbridge and stairs are predominantly modern concrete and steel structures. The stairs provide access to the platform from surrounding residential areas and Knox Grammar School. A footpath extends south from the station along the western rail corridor, linking to residential areas to the south and east.

Heritage station platform building and overbridge

The boundary of the railway corridor is densely vegetated, creating a strong east-west visual boundary, enclosing views between the station and adjacent residential areas. The group of mature native trees in the Warrawee reserve and streetscape of Heydon Avenue, to the west of the station, filter views between the station, the commuter car park and adjacent school. The landscape and visual conditions of the study area are illustrated in Figure 7-1.

Local reserve and commuter car park, Heydon Avenue

The corridor includes numerous overhead poles and wires, and corridor security fencing which create some visual clutter. To the south of the station, the landform rises to a local highpoint, coinciding with the location of a pillar box and telecommunications mast. The mast sits below

the height of the surrounding vegetation and is not visually obtrusive.

The station is located within a well-established and historic suburban area of Warrawee. This area has a high concentration of architect-designed heritage listed buildings, built from the late 19th century, with '*fine landscaped garden settings on large sites'* (Ku-ring-gai Council, 2015b, Heritage Data Form). Although there are no formal avenues of street trees within the area, the network of mature trees in street verges and generous gardens with canopies extending over the street give an '*urban forest appearance to the area*' (Ku-ring-gai Council, 2015b, Heritage Data Form).

Warrawee conservation area, Warrawee Avenue

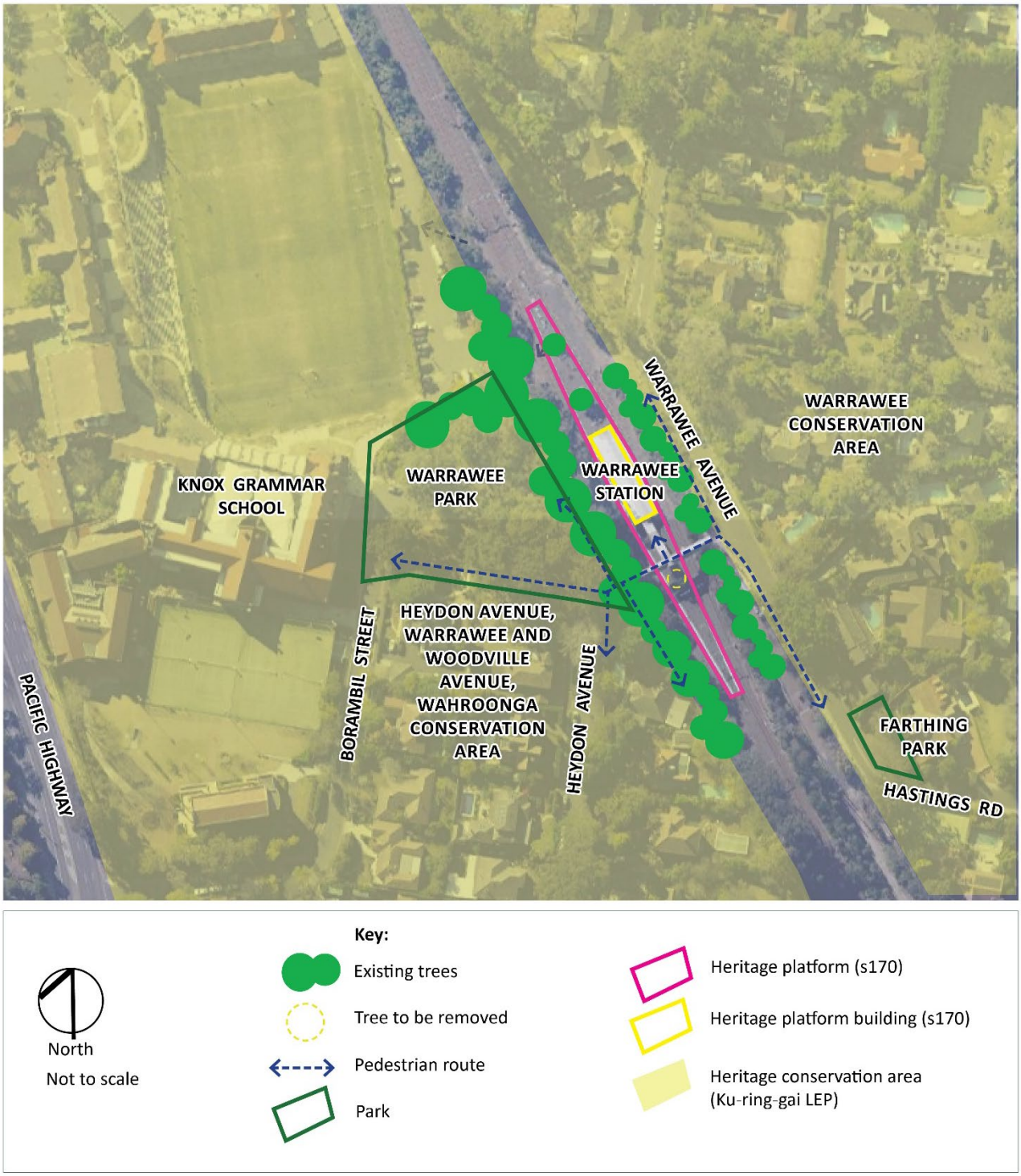

Figure 7-1 Landscape and visual features of the site

Assessment of representative viewpoints

The following viewpoints were selected as representative of the range of views to the site and the proposed development:

1. view south from Warrawee Avenue
2. view north-west from Warrawee Avenue
3. view west along Hastings Road
4. view north along the station platform
5. view south along the station platform
6. view east from Heydon Avenue
7. view north from the footpath along the western side of the rail corridor.

The location of these viewpoints is shown on Figure 7-2 and an assessment of each viewpoint is summarised on the following pages.

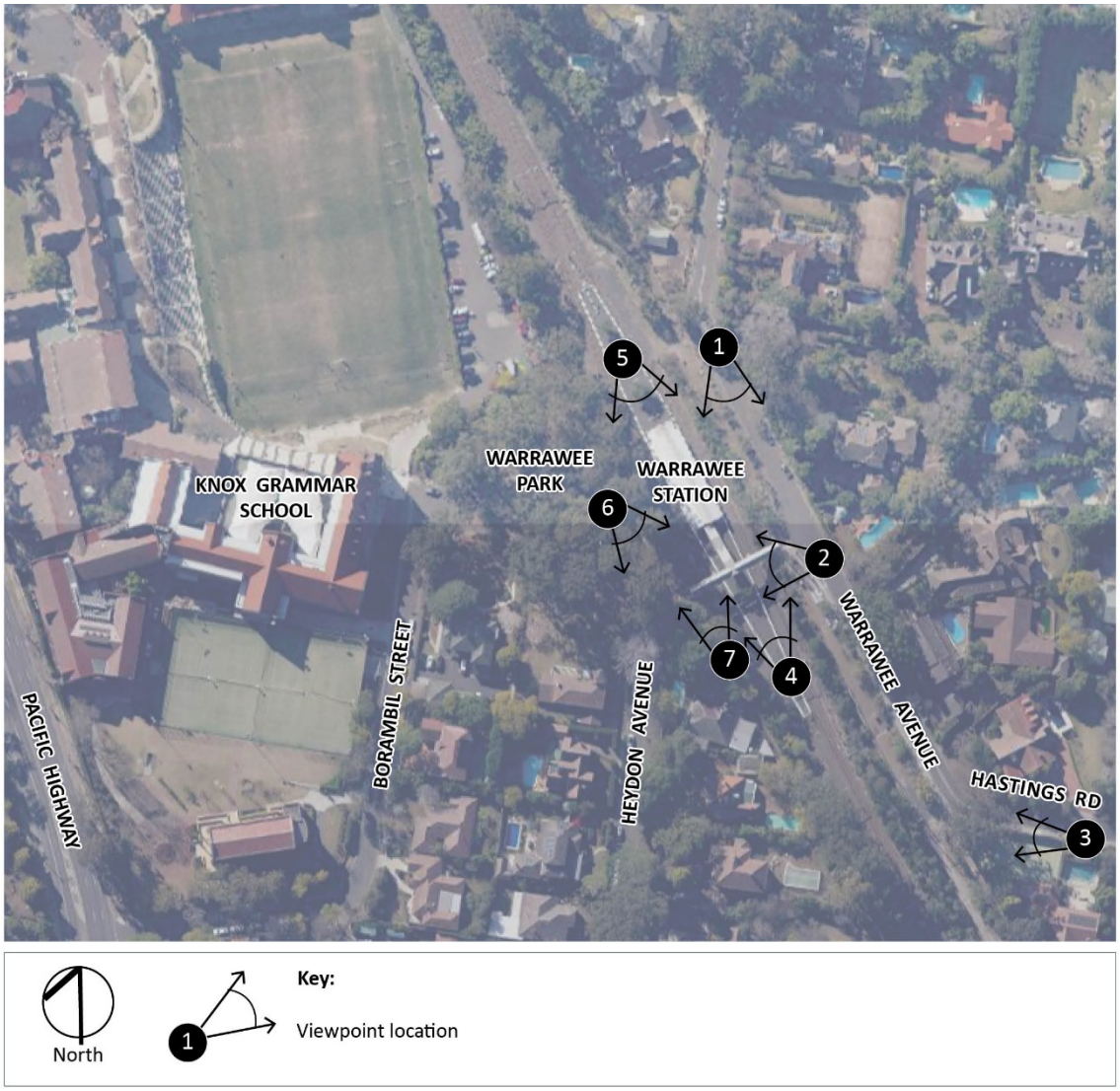

Figure 7-2 Viewpoint location plan

Viewpoint 1: View south from Warrawee Avenue

Figure 7-3 Viewpoint 1: View south from Warrawee Avenue

Existing view: This view along Warrawee Avenue shows the landscape setting of the rail corridor, north-east of the station. At this point the rail corridor emerges from the rail cutting, almost at street level with Warrawee Avenue. The station, including the island platform, station building, and footbridge are not visible, due to intervening landform and vegetation along the rail corridor. The entrance to the footbridge and station is visible in the middle ground of the view, with steel security fencing extending either side of the entrance, along the rail corridor.

There is a vegetated backdrop to the view including the street trees along Warrawee Avenue, mature shrubs within the rail corridor and the bushland in the small reserve to the west of the corridor. The dense cover of mature shrubs and trees provide a strong sense of visual enclosure to the rail corridor and limits views to the station from adjacent residential areas of Warrawee.

Visual sensitivity: This view is of local visual sensitivity. Although it is a suburban street, its sensitivity is increased due to its unique character and identification as a place of historic importance in the Ku-ring-gai LEP (Warrawee conservation area).

Visual impact during construction: The construction activity on the station platform and to construct the lift structure would be screened in views from this location as the station is located below street level, and the vegetation along the rail corridor would be retained.

There may be some glimpses to construction vehicles approaching the construction compound in the background of the view. However, the existing vegetation would likely screen views to the works within the compound itself.

Installation of a new isolating transformer would be seen from this location on rail land adjacent to Warrawee Avenue (to the right and out of this view). Installation of this new service pole may also be seen, with wires connecting to an existing electricity supply within the rail property boundary. Although a small area of grass would be cleared to accommodate the transformer, no trees would be removed.

Overall, there would be no change in the amenity of this view, and there would be a **negligible visual impact** during construction.

Visual impact during operation: The upgrade works to Warrawee Station would not be seen from this location. The new transformer and service pole would not contrast with the visual character of the rail corridor, which already contains infrastructure elements. Therefore, there would be no change in the visual amenity of this view, and a **negligible adverse visual impact** during operation.

Viewpoint 2: View north-west from Warrawee Avenue

Figure 7-4 Viewpoint 2: View north-west from Warrawee Avenue

Figure 7-5 Viewpoint 2: View north-west from Warrawee Avenue, photomontage

Existing view: In this view from the eastern footpath on Warawee Avenue, the station platform and trains are screened through their location within the rail cutting. The upper level of the existing footbridge can be seen through vegetation along the rail corridor.

The mature trees on the western side of the rail corridor and the gardens of properties on Heydon Avenue form a vegetated backdrop, enclosing the view. The view includes pillar boxes in the foreground, and corridor fencing.

Visual sensitivity: This view is of local visual sensitivity. It is both a local approach to the station and an area identified as a place with a unique heritage character (Warrawee Conservation Area, Kur-ring-gai LEP).

Visual impact during construction: A construction compound would be established in rail corridor land, between the track and Warrawee Avenue, to be used for construction activities such as materials delivery and laydown. The compound would be located further to the south, adjacent to access gate, and would not be seen from this location.

The pole transformer and ancillary equipment visible in the centre of view would be decommissioned and removed. Further to the north (right of view), 4 trees would be removed at the station entrance, as part of the footpath upgrade works, opening up views to the rail corridor.

Works to construct the new lift structure would be visible in front and rising above the existing footbridge. This structure would not rise above the vegetated backdrop and would contrast somewhat with the surrounding leafy view.

As the station is located below street level, the platform re-grading and construction of the lower areas of the lift structure would be out of view.

This would create a minor reduction in the visual amenity of this view, and result in a minor adverse visual impact during construction.

Visual impact during operation: The upper portion of the new lift structure would be seen in the middle ground of this view, rising above the existing footbridge. This structure would be in keeping with the character of the existing station with a pitched roofline and metal sheet roofing. The lift structure would incorporate glazing and have some transparency at the upper level.

This work would be seen through rail corridor fencing and be partly screened by vegetation and the padmount transformer. Removal of the pole transformer and ancillary equipment would declutter the central part of this view and improve the visual character of the station entrance.

The works would be consistent with the built character of this view and absorbed into the character of this view. Although the removal of the pole transformer and ancillary equipment would provide some visual improvement, overall, the proposal would result in no perceived change in the amenity of this view, and a **negligible visual impact** overall.

Viewpoint 3: View west along Hastings Road

Figure 7-6 Viewpoint 3: View west along Hastings Road

Existing view: This view along Hastings Road shows the leafy and low-density character of Warrawee, with large detached period homes set well back from the street on large lots and generous front gardens that enclose views and create a strong sense of privacy.

The rail corridor is visible at the end of the street, where it curves north towards the station. As the rail corridor is located below street level, in the rail cutting, the station and trains travelling along the track are not seen.

The western side of the rail corridor can be seen in the background, including mature trees along the top of the rail cutting and in the rear gardens of residential properties in Heydon Avenue.

Visual sensitivity: This view is of local visual sensitivity. Although is a suburban street, its sensitivity is increased due to its unique character and local identification as a place of historic importance (Warrawee conservation area, *Ku-ring-gai LEP*).

Visual impact during construction: A construction compound would be established in the middle ground of the view, between Hastings Road and the rail corridor, at the top of the rail cutting. This area would be used for construction activities as materials delivery and laydown. Trucks and construction vehicles would be seen travelling along Hastings Road, between the main construction compound and lift work area. The ornamental gardens and trees along Hastings Road would screen much of this compound from adjacent properties.

As the station is located below street level, the platform re-grading and construction of the lift structure would be out of view.

This would create a minor reduction in the visual amenity of this view, and result in a **minor adverse visual impact** during construction.

Visual impact during operation: The upgrade works to Warrawee Station would be out of view. The construction compound undergo rectification works post construction. Overall there would be no change in the amenity of this view, and a **negligible visual impact** during operation.

Viewpoint 4: View north along the station platform

Figure 7-7 Viewpoint 4: View north along the station platform

Figure 7-8 Viewpoint 4: View north along the station platform

Existing view: The footbridge, stairs and platform building are visible in the middle ground of view. The footbridge extends across the view from Heydon Avenue to Warrawee Avenue, consisting of a precast box girder concrete bridge supported by concrete columns at the station platform. The island platform is curved, with the platform building located in the centre, beyond the stairs. The station is located in a rail cutting, below street level, with vegetation along the cutting and adjacent streets providing enclosure and limiting views from nearby residences.

Visual sensitivity: This view is of local visual sensitivity as the station platform is a gathering place for people using public transport and Warrawee Station has a local heritage listing.

Visual impact during construction: Works to construct the lift structure would be seen in the middle and foreground of this view. The footbridge would be retained, and hoarding erected along the southern side.

The existing tree on the platform and adjacent seating and lighting would be removed and replaced, to make room for the new lift structure. Excavation of the lift foundations and installation of the lift structure, cladding, roofing and platform canopy would be visible above any site fencing. Works to regrade the platform would also be seen in the foreground of view. The installation of new lighting and an additional seat on the platform would also be seen in this view.

The construction compound along Warrawee Avenue would not be visible from this location, due to intervening landform and vegetation.

The character and close proximity of this construction activity would contrast with the heritage and leafy character of the station and be seen in close proximity to commuters. This would result in a considerable reduction in the visual amenity of this view and a **moderate adverse visual impact** although only during the construction period.

Visual impact during operation: The lift structure would be a new and prominent feature in this view. The lift shaft would be seen in the middle ground of view, with a new canopy extending along the platform and linking to the stairs. The base of the lift shaft would be brick to match the existing brickwork of the platform building, with a glazed lift shaft and pitched roof with steel sheeting rising above the roof of the footbridge. The handrails on the footbridge would be replaced with new compliant handrails, resulting in very little change to the visual character of the existing footbridge.

Improvements to the platform surface, including minor regrading and tactile indicators, would be consistent in character with the surrounding station platform.

Whilst the lift structure would be consistent in character with the existing structures at the station, the scale and massing of the lift would obstruct views to the heritage platform building.

Overall, this would result in a minor reduction in the amenity of this view and a **minor adverse visual impact** during operation.

Viewpoint 5: View south along the station platform

Figure 7-9 Viewpoint 5: View south along the station platform

Existing view: Warrawee Station is located below street level in the rail cutting and enclosed by vegetation along the east (right of view) and west (left of view) of the rail corridor.

The heritage listed station platform building is a typical early twentieth century single story station building, located in the centre of the platform. The precast concrete footbridge (c 1970s) can be seen beyond the heritage building, spanning the cutting between Heydon and Warrawee Avenues. Views to the station building and footbridge are partially screened by a platform tree *(Fraxinus griffithii)* in the middle ground of the view.

The dense cover of mature shrubs and small trees along the cuttings provide a strong sense of enclosure and limits views to the station from adjacent residential areas.

The view includes platform lighting and overhead wires and associated equipment along the rail corridor. Commuter and freight trains are regularly seen travelling through the station.

Visual sensitivity: This view is of local visual sensitivity as the station platform is a gathering place for groups of people accessing public transport and Warrawee Station has a local heritage listing.

Visual impact during construction: Works to regrade the platform would be seen in the foreground of this view as would the works to improve the amenities within the station platform building.

Works to construct the new lift would be located in the background of view, south of the existing platform building, and would be screened by the intervening tree and platform building. The construction compound along Warrawee Avenue would also be out of view.

The visible works would be minor in nature and would not alter a substantial part of the view, resulting in a minor reduction in the amenity of this view, and a **minor adverse visual impact** during construction.

Visual impact during operation: The new lift structure and platform canopy would not be seen from this location. Upgrades to the platform surface and tactile indicators (TGSIs) would appear consistent with the surrounding platform. Works to the platform building would also not be noticeable.

Overall, the proposed works would be absorbed into the character of the view and there would be no change in the amenity of this view and a **negligible visual impact** during operation.

Viewpoint 6: View east from Heydon Avenue

Figure 7-10 Viewpoint 6: View east from Heydon Avenue

Existing view: This view across Heydon Avenue includes the small commuter car park and adjacent reserve in the foreground. The station is located in the rail cutting below street level (left and centre of view). The western entrance to the footbridge can be seen in the centre, middle ground of the view, behind the rail corridor fencing and a small brick shelter on Heydon Avenue. The vegetation and street trees surrounding the commuter car park are of local significance providing an '*urban forest character*' (Ku-ring-gai Council, 2015, Heritage Data Form) and a leafy backdrop to this view.

Visual sensitivity: This view is of local visual sensitivity as it is located adjacent to the railway station commuter car park. This pathway is also the main route between the station and Knox Grammar School and is used by large groups of people accessing the station.

Visual impact during construction: Works to the existing footbridge would be seen, as would the uppermost portion of the works to construct the lift rise slightly above the existing footbridge, amongst surrounding vegetation.

In the middle and foreground of the view, works to construct two accessible car parking spaces and one kiss-and-ride space, a paved area at the station entrance, and kerb works would be seen on Heydon Avenue. This work would create a minor reduction in the amenity of this view, and result in a **minor adverse visual impact** during construction.

Visual impact during operation: Upgrades to the kerbside facilities on Heydon Avenue would be visible in the middle to foreground of this view and be consistent in character with the existing streetscape. The upper portions of the new lift structure would also be seen, rising slightly above the existing footbridge, in the background of the view. This new structure would be largely screened by the footbridge roofline and intervening vegetation, and would be absorbed into the background of the view.

Overall, the new works would comprise a small part of this view, as the trees that contribute to the leafy character of this location would be retained. This would result in no perceived change in visual amenity of this view, and a **negligible visual impact** during operation.

Viewpoint 7: View north from the footpath along the western side of the rail corridor

Figure 7-11 Viewpoint 7: View north from the footpath along the western side of the rail corridor

Existing view: The railway station and tracks are located in the rail cutting (right of view), set down from adjacent residential properties (left of view).

The chainmesh fence and vegetation along the cutting filter views to the station and track, meaning glimpses to the station, including the corrugated steel rooftop of the footbridge and platform, can be seen. Trains would also be visible entering and departing the station.

Views from these properties (left of view) to the rail corridor would be limited by perimeter fencing and existing vegetation.

Visual sensitivity: This view is of neighbourhood visual sensitivity. It is from a small pathway located between residences in suburban Warrawee and the railway corridor, used mainly by local residences accessing the station and nearby school.

Visual impact during construction: Construction of the new lift structure to the south of the footbridge would be visible in this view; particularly the lift shaft rising above the roofline of the footbridge. The footbridge would be retained. The existing platform tree would be removed and replaced (with a similar tree) further north and repair work would take place on the platform. This activity would be seen through intervening vegetation and the existing rail corridor fencing.

The character of this construction activity would contrast somewhat with the leafy character of this view but be filtered through intervening vegetation and seen in the middle to background of the view. Overall, this would result in a noticeable reduction in the visual amenity of this view and a **minor adverse visual impact** during construction.

Visual impact during operation: From this location, the new lift structure would be visible including the new glazed lift shaft and pitched roof to the lift structure rising above the roof of the footbridge.

The lift structure would be higher than the existing footbridge canopy , providing a new skyline element. However, the visual impact of the lift would be reduced by the proposed simple form and material palette of a steel framed lift structure with infill glass panels and pitched roof. The structure would also be seen in the middle to background of views from this footpath and be filtered through intervening vegetation.

The platform would be also be upgraded to meet DDA compliance, with resurfacing works visible. The new replacement tree would also be seen on the station platform.

Overall, the station would have an increased visual prominence in this view, however, the lift structure would be seen in a developed context of the station, be visually contained by the leafy backdrop of trees and filtered through intervening vegetation.

Overall, there would be no perceived change in the amenity of this view, and a **negligible visual impact** during operation.

Summary of daytime impacts

The following table, Table 7-1, summarises the impacts identified in the viewpoint assessment.

Table 7-1 Summary of Assessment

			Construction		Operation	
			Day		Day	
Viewpoint number and location		Sensitivity	Magnitude	Visual Impact	Magnitude	Visual Impact
1	View south from Warrawee Avenue	Local	No perceived change	Negligible	No perceived change	Negligible
2	View north-west from Warrawee Avenue	Local	Minor reduction	Minor adverse	No perceived change	Negligible
3	View west along Hastings Road	Local	Minor reduction	Minor adverse	No perceived change	Negligible
4	View north along the station platform	Local	Considerable reduction	Moderate adverse	Minor reduction	Minor adverse
5	View south along the station platform	Local	Minor reduction	Minor adverse	No perceived change	Negligible
6	View east from Heydon Avenue	Local	Minor reduction	Minor adverse	No perceived change	Negligible
7	View north from the footpath along the western side of the rail corridor	Local	Noticeable reduction	Minor adverse	No perceived change	Negligible

The following summarises the findings of this viewpoint assessment.

View from residential areas to the east

Construction works within the station would not be visible from residential areas to the east of the site (refer Viewpoint 1, 2 and 3). However, there would be some views to construction vehicles accessing the compound on the rail corridor, from Hastings Road and Brentwood Avenue. Overall, there would be **negligible** to **minor adverse visual impacts** experienced in views from residential areas to the east of the station during construction.

During operation, the new lift structure would be largely screened by intervening landform and existing vegetation. There would be views to the upper portion of the lift structure from views in the vicinity of the entry to the footbridge on Warrawee Avenue, however, the lift would not rise above the background vegetation and would be viewed through intervening vegetation and fencing. Overall there would be a **negligible visual impact** during operation.

Views from within the station

Works would include excavation of the lift foundations and installation of the lift structure, cladding, roofing and canopy would be visible above any site area fencing. Works to regrade the platform would also be seen in the foreground of these views. (refer to viewpoint 4).

Works to construct the lift structure would be seen in the middle and foreground of views from the southern areas of the station. The existing tree on the platform and adjacent seating and lighting would be removed and replaced, to make room for the new lift structure.

Views south from the northern areas of the station, would have a limited view to the proposed works (refer to viewpoint 5) as the works would be screened by the existing station platform building and awnings and trees within the platform.

Where visible, the lift would have a simple form and material palette so that it does not visually compete with the heritage station platform building. It would incorporate brickwork at the base of the structure, to reflect the materials and colour palette of the heritage platform building.

Although the lift would be taller than the existing station elements, it would be generally in scale with the existing built form and not be visually dominant.

Overall there would be **negligible visual impact** experienced in views from residential areas to the east of the station during operation.

View from areas to the west

Much of the construction works within the station would not be visible from residential areas to the west of the site due to the existing vegetation along the rail corridor and within Warrawee Park. (refer Viewpoint 6 and 7) However, there would be some visibility of the works from the entry to the footbridge, where there are construction works on the footbridge and works to erect the lift structure rising above the footbridge. There would also be some views from the footpath along the western side of the rail corridor where the views are filtered through intervening vegetation along the rail corridor. Overall, there would be **minor adverse visual impacts** experienced in views from areas to the west of the station during construction.

During operation, the new lift structure would be largely absorbed into the character of the station. It would be screened by intervening landform and filtered through existing vegetation from most locations. Where it is visible, it would not rise above the vegetation in the background of the view and would not be visually dominant in the view. Overall, due to the limited visibility of the proposal and visual absorption capacity of the landscape, there would be a **negligible visual impact** during operation.

Views at night

At night, the Proposal would be in an area of **moderate district brightness**, with the existing, station and railway corridor creating a moderately well-lit night-time environment. Surrounding this, the residential areas are **low district brightness.**

During construction, the work areas and adjacent main construction compound would be lit for security. However, it is unlikely that these areas would be used on an ongoing basis for construction activity during evening hours (other than for specific activities or where works are undertaken during possession periods).

Generally, the character of the construction works at the lift work area and main construction compound at night would be visually absorbed into the surrounding brightly lit environment of the station. The works would create a minor reduction in amenity and result in **negligible adverse visual** impact during construction.

During operations, the upgraded station would continue to be brightly lit for security and safe use at night. The new platform lift and minor upgrades at Warrawee Avenue would be seen in the context of the existing station lighting. The location of the new lift structure in the rail cutting, would further enclose the additional lighting provided by the Proposal.

Generally, the character of the proposed station upgrade at night would be visually absorbed into the surrounding brightly lit station environment and the legibility of the precinct would be improved. Overall, this would result in no perceived change in the amenity of views at night, resulting in a **negligible visual impact** at night during operation.

7.0 Urban design and landscape character assessment

The Proposal is generally consistent with the intent and strategies identified in the Ku-ring-gai DCP (2015). Whilst the requirements of the DCP are not directly relevant to this approval, the following assessment uses the requirements of these planning instruments as a guide.

The following table provides a summary of how the Proposal has responded to these requirements.

Table 8-1 Urban Design and Landscape Character Assessment

Urban design requirement	Response
Tree preservation: • *'retain significant and visually prominent trees and vegetation that contributes to neighbourhood character'* (cl 21.2[1ii]).	Four trees would be removed on Warrawee Avenue, north of the station entrance. However, views to these trees are contained within the immediate surrounds of Warrawee Avenue, and the trees are not visually prominent within the surrounding neighbourhood. Although one platform tree would be removed to make way for the proposed lift structure, it would be replaced further north along the platform, in consultation with Sydney Trains.
Landscape design: • *'provide screening for visually obtrusive land uses or building elements'* (cl 21.2). • '*create a setting for the building by planting tall trees which contribute to the tree canopy*' (cl 21.3[3i].	The Proposal is not visually obtrusive and is visually enclosed by tall trees which would be unchanged by the Proposal. There is no need for additional landscape works to assist in the visual integration of the Proposal.
Heritage conservation: • '*New development in the vicinity of a Heritage Item or HCA is to demonstrate that it will not reduce or impair important views to and from the Heritage Item from the public domain'* (cl 19F.1[4])	The Proposal is visually separate from the Heritage Conservation Areas and would not obstruct any view to a Heritage item.

Urban design requirement	Response
General building design: • *'Large, unbroken expanses of any single material and finish (rendered or not) to building facades must be avoided'* (cl 23.4[12]) • '*new development is to avoid extensive use of highly reflective or gloss materials on the exterior of buildings*' (cl 23.4[13])	The lift would have a simple form and material palette and would not include any large, unbroken expanses of any single material. The Proposal would not include any highly reflective or gloss materials.

Other urban design issues include:

Urban design consideration	Response
Overshadowing	Overshadowing of adjacent properties would be limited to the winter months, due to: • The location of the station building and proposed lift are located in the rail cutting, separating the proposed works from the adjacent residential areas • The distance between the station and nearby residential properties.
Connectivity and legibility	During construction, there would be some adjustments to station access and legibility as the works are undertaken. However, during operation, station access and legibility would be substantially improved by the Proposal. The introduction of a lift, and improvements to the surrounding footpaths and kerbside facilities would provide compliant access to the station for all users.

During construction, the Proposal would result in a minor reduction in station accessibility and legibility, and would only require the removal of four trees on Warrawee Avenue and one tree on the station platform (to be replaced). This would result in a minor reduction in the landscape quality and urban design functionality of the station precinct and a **minor adverse urban design and landscape impact**.

During operation, there would be a substantial improvement to accessibility created by the introduction of the lift, improvements to the platform levels and tactile indicators, new platform canopy and improvements to the surrounding footpaths. There would be less shade and amenity on the southern portion of the station due to the removal of the existing tree, however, opportunities for an additional tree within the station precinct would be investigated.

Overall, this would result in a minor improvement in the urban design functionality of the station precinct and a **minor beneficial urban design and landscape impact** during operation.

8.0 Mitigation of impacts

The following mitigation measures would be implemented to reduce the visual impacts of the Proposal:

- an Urban Design Plan (UDP) would be prepared which demonstrates design excellence in the essential urban design requirements of the Project, as evident in the following matters:

  a) the appropriateness of the proposed design with respect to the existing surrounding landscape, built form, behaviours and use-patterns (including consideration of Crime Prevention Through Environmental Design principles). This is to include but not be limited to:

     i. connectivity with surrounding local and regional movement networks including street networks, other transport modes and active transport networks. Existing and proposed paths of travel for pedestrians and bicycles should be shown
     ii. integration with surrounding local and regional open space and or landscape networks. Existing and proposed open space infrastructure/landscape elements should be shown
     iii. integration with surrounding streetscape including street wall height, active frontages, awnings, street trees, entries, vehicle cross overs etc
     iv. integration with surrounding built form (existing or desired future) including building height, scale, bulk, massing and land-use.

  b) total water management principles to be integrated into the design where considered appropriate
  c) any other matters which the conditions require the UDP to address.

- the UDP would be:

  1. prepared and submitted to TfNSW with the first design submission (System Definition Review) and updated for subsequent design submissions
  2. prepared in consultation with councils and relevant stakeholders
  3. prepared by a registered architect and/or landscape architect who has appropriate and relevant urban design expertise
  4. endorsed by the TfNSW Urban Design team.

- a Public Domain Plan (PDP) would be prepared which demonstrates design excellence in the essential urban design requirements of the Project, as evident in the following matters:

  a) materials, finishes, colour schemes and maintenance procedures including graffiti control for new walls, barriers and fences

  b) location and design of pedestrian pathways, street (where relevant), telephones and lighting equipment

  c) landscape treatments and street tree planting to integrate with surrounding streetscape

     i. landscape details, including details of soil preparation, mulches, plant selection, plant sizes (planting container and expected final sizes)
     ii. selection and location of new tree plantings that may provide partial screening of the station from surrounding receivers and facilitate improved amenity
     iii. where platform garden beds are to be relocated or replaced, use of plants of a similar species and maturity
     iv. a schedule which details the landscape maintenance requirements to be

implemented for the12 month period following the commencement of operation

d) opportunities for public art created by local artists to be incorporated, where considered appropriate, into the Project

e) total water management principles to be integrated into the design where considered appropriate

f) design measures included to meet ISCA Sustainability Infrastructure Rating Scheme

g) identification of design and landscaping aspects that will be open for stakeholder input, as required

h) any other matters which the conditions require the PDP to address.

- the PDP would be:

  1. prepared and submitted to TfNSW with the first design submission (System Definition Review) and updated for subsequent design submissions
  2. prepared in consultation with councils and relevant stakeholders
  3. prepared by a registered landscape architect
  4. endorsed by TfNSW's Precincts and Urban Design team.

- all permanent lighting would be designed and installed in accordance with the requirements of standards relevant to AS 1158 *Lighting for Roads and Public Spaces* and AS 4282 *Controlling the Obtrusive Effects of Outdoor Lighting*

- the detailed design of the Proposal would comply with Crime Prevention Through Environmental Design principles

- worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations

- temporary hoardings, barriers, traffic management and signage would be removed when no longer required

- during construction, graffiti would be removed in accordance with TfNSW's Standard Requirements.

In addition, the following mitigation measures should be considered:

- all trees to be retained should be protected prior to the commencement of construction in accordance with AS4970 the Australian Standard for Protection of Trees on Development Sites and Adjoining Properties

- temporary access arrangements should be well signed and provide a visually legible route for pedestrians

- site equipment and facilities should be consolidated to maximise the area of useable public realm and maintain pedestrian permeability.

- a colour palette which is complementary to the heritage character of the station should be selected.

9.0 References

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