

Transport Access Program 3: Killara Station Upgrade

Landscape Character and Visual Impact Assessment

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Client: Transport for NSW

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Abbreviations and definitions

Abbreviation	Meaning
CBD	Central Business District
CCTV	Closed Circuit TV
GLVIA3	<i>Guidelines for Landscape and Visual Impact Assessment, Third Edition</i> (Landscape Institute and Institute for Environmental Management (UK), 2013)
HCA	Heritage Conservation Area
LCVIA	Landscape Character and Visual Impact Assessment
LCZ	Landscape Character Zones
LEP	Local Environmental Plan
NSW	New South Wales
PA system	Public Address system
REF	Review of Environmental Factors
Tactiles	Tactile Ground Surface Indicators
TPZ	Tree Protection Zone
ZTV	Zone of Theoretical Visibility

Term	Definition
Interchange	Transport interchange refers to the area/s where passengers transit between vehicles or between transport modes. It includes the pedestrian pathways and cycle facilities in and around an interchange.
Kiss and ride bay	A kiss and ride bay allows for quick entry and exit which helps minimise congestion and risk when used properly. These types of bays operate under the same conditions as no parking zones, which means a customer may stop to drop off or pick up others for a maximum of two minutes. They are required to remain in, or within three metres of their vehicle (Service NSW, 2016).
Magnitude (of effect)	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or not, and whether the change is short or long term in duration (GLVIA, 2013).
Photomontage	A computer simulation illustrating the predicted appearance of a development overlaid on a photo of the existing view.
Proposal area	The area within which all the Proposal construction and operational elements will be contained within.
Sensitive receivers	(or 'visual receivers'). Individuals and/or defined groups of people who have the potential to be affected by a Proposal (GLVIA, 2013).
Sensitivity	A term applied to specific receivers, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor (GLVIA, 2013).
Study area	The area within which the impact of the Proposal on landscape character, views and visual amenity is assessed in this report.

The Proposal	The construction and operation of the Killara Station Upgrade.
Viewpoint	The location from which an assessment is made of the impact the Proposal has on the view.
Visual amenity	The overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of the people living, working, recreating, visiting or travelling through an area (GLVIA, 2013).

Executive summary

The Transport Access Program is a NSW Government initiative run by Transport for NSW to provide accessible, modern, secure and integrated transport infrastructure across NSW. This Proposal forms part of the Transport Access Program and involves an accessibility upgrade of Killara Station to improve accessibility and amenities for customers.

AECOM has been engaged to prepare a Review of Environmental Factors (REF) for the Proposal, including a Landscape Character and Visual Impact Assessment (LCVIA).

The key features of the Proposal considered in this assessment include the installation of three new lifts and lift landings connecting to the existing footbridge to provide access to the station platform, widening of the existing footbridge to accommodate the lifts, platform works including regrading, provision of new seating and canopies for the two existing boarding assistance zones, provision of a kiss and ride bay and accessible parking spaces on Culworth Avenue, footpath upgrades and other new access path modifications. The existing station building toilets would also be upgraded with provision of a new unisex ambulant toilet and a new family accessible toilet.

The Proposal is located at Killara Station on the T1 North Shore Line, approximately 12 kms north-west of the Sydney Central Business District (CBD). Killara Station is a small suburban station, comprising an island platform positioned between the north and south bound tracks. The station holds historical, aesthetic, social and representative significance as an example of a typical suburban station with associated ornamental gardens. The gardens are said to contribute to the character of the North Shore.

To the east of the rail corridor, under the Ku-ring-gai Local Environmental Plan 2015 (Ku-ring-gai LEP) land is primarily zoned R2 Low Density Residential, with only one small pocket of RE1 Public Recreation near the station and E2 Environmental Conservation in the lower portion of a drainage corridor.

Landscape character impact assessment

A summary of the assessment of the Proposal on landscape character is shown in Table i.

Table i Summary of landscape character impact assessment ratings

LCZ	Sensitivity	Magnitude	Overall rating
LCZ 1: Rail Corridor	Moderate	Moderate	Moderate
LCZ 2: Major Road Corridor	No Change		
LCZ 3: High Density Residential	No Change		
LCZ 4: Low Density Residential	Moderate	Low	Moderate to Low
LCZ 5: Public Open Space	No Change		
LCZ 6: Commercial	No Change		

While the upgrade of existing rail infrastructure would not result in a change to the character of the greater LCZ 1, the addition of three larger structures (the lifts) would result in the modernisation of rail infrastructure within the rail corridor resulting in a change in the existing suburban character of the station precinct, elements of which are heritage listed.

Changes within the landscape surrounding the station (predominantly LCZ 4: Low Density Residential) are minimal, however, the sensitivity of the LCZ lies predominantly in the heritage setting of the residential suburb. Changes to the road verge and station entrance within this context are therefore important, if not substantial.

Visual impact assessment

Construction

During construction, visible construction elements would be expected to typically include a range of site sheds, hoardings, plant – including machinery for excavation of lift wells, a crane to place the lifts, and heavy vehicles bringing in and unloading materials. The visual impacts would be associated with the temporary construction compound within the council car park off Culworth Avenue and on the corner of Culworth Avenue and Powell Street.

Overall, views to the construction compounds and other construction activity due to the Proposal are considered to be relatively minor. They would be consistent with similar temporary construction work sites and activities, and transitory over a period of about 18 months until completion of the Proposal. A majority of the receivers would have a low sensitivity to the changes (being passers-by and rail commuters) and there would be a low number of receivers with a higher sensitivity to the changes.

Operation

The most visually prominent changes resulting from the Proposal include construction of three lifts, changes to the footbridge, removal of vegetation and changes to the footpaths and station infrastructure. Changes to the platform and immediate surrounds within the rail corridor would be difficult to see from the surrounding landscape due to changes in landform, surrounding built form and planting.

The station precinct, while elevated above the sloping landscape to the east, is visually shielded with views to and from limited by these factors. Views to the station are predominantly seen by visual receivers directly surrounding the station, including receivers passing the station in vehicles.

A summary of the assessment of the Proposal on views is shown in Table ii.

Table ii Summary of visual impact assessment ratings

Viewpoint	Sensitivity	Magnitude	Overall rating	Qualitative assessment
Viewpoint 1: Culworth Avenue and Lorne Avenue	Low	Low	Low	Neutral
Viewpoint 2: Culworth Avenue council car park	Low	Moderate	Moderate to Low	Neutral
Viewpoint 3: 18 Culworth Avenue	Moderate	Moderate	Moderate	Neutral
Viewpoint 4: Werona Avenue and Locksley Street	Moderate	Moderate	Moderate	Adverse
Viewpoint 5: 25 Werona Avenue	Moderate	Low	Moderate to Low	Neutral

Existing views and photomontages showing the proposed view from Viewpoint 3: 18 Culworth Avenue and Viewpoint 4: Werona Avenue and Locksley Street are shown in Figure a, Figure b, Figure c and Figure d.



Figure a Existing view from Viewpoint 3 looking north east from 18 Culworth Avenue (Source: AECOM)



Figure b Photomontage showing the proposed changes to the existing view from Viewpoint 3 (Source: AECOM)



Figure c Existing view looking west from the intersection of Werona Avenue and Locksley Street (Source: AECOM)



Figure d Photomontage showing the proposed changes to the existing view from Viewpoint 4 (Source: AECOM)

Overall, the visual impact to receivers has been assessed between Low (neutral) to Moderate (adverse), with no viewpoints returning a significant change in views (i.e. overall ratings of High to Moderate or High). The proposed changes include an upgrade to an existing rail precinct with the changes (particularly the proposed lifts within the rail corridor) comprising modern additions to the rail concourse. These changes are considered appropriate given the benefit of the Proposal in comparison to the low number of sensitive visual receivers that would see the changes.

The sensitivity of the visual receivers surrounding the station (particularly from the more sensitive residential receivers to the north of the rail corridor) is generally low given the presence of screening vegetation along the rail corridor edge.

The assessment resulted in a 'neutral' qualitative rating from four out of the five viewpoints. This is due to:

- the visually recessive nature of a majority of the changes within the greater view from most viewpoints
- the addition or upgrade of rail infrastructure within an existing rail corridor.

One 'adverse' qualitative rating was due to the change to the suburban station setting with the addition of the proposed lift structures, which would raise the visual prominence of the station within the suburban setting. Overall, the design and materiality of the proposed elements would fit within the greater suite of architectural elements within the wider rail corridor.

Mitigation measures*Design Development*

The following general mitigation measures are recommended to minimise visual impacts during the design development process:

- landscaping within the road verges and along the rail corridor edges (including potential planting of street trees or shrubs, if possible) would be considered
- design elements would reference the heritage character of the station and surrounding landscape, however, maintain the visual quality of a 'new' piece of infrastructure rather than replicating heritage items
- the protection of the heritage gardens on the eastern side of the station is recommended to preserve the character of the suburban station within its heritage setting
- disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal
- measures to limit or deter graffiti on proposed structures would be considered.

Construction

The following mitigation measures are recommended to minimise visual impacts as a result of construction:

- establish tree protection zones (TPZs) around trees to be retained. Tree protection would be undertaken in keeping with AS 4970-2009 Protection of Trees on Development Sites and would include exclusion fencing of TPZs
- provide well-presented and maintained construction hoarding and site fencing with shade cloth (or similar material) (where necessary) to minimise visual impacts during construction. Hoardings and site fencing would be removed following construction completion
- provide cut-off or directed lighting within and outside of the construction site, with lighting location and direction considered to ensure glare and light spill is minimised
- keep construction areas clean and tidy and place waste in appropriate receptacles
- implement measures to ensure no tracking of dirt and mud into public roads and other public spaces from construction activities and vehicle movements.

Operation

The following mitigation measures are recommended to minimise visual impacts as a result of operation:

- ongoing maintenance and repair of constructed elements
- removal of graffiti in accordance with Transport for NSW / Sydney Trains maintenance requirements.

Conclusion

The effects of the Proposal on landscape character would range between No change and Moderate, and on views and visual amenity would range between Low (neutral) and Moderate (adverse). As such, this report finds that would be no significant effect on either landscape character or on views and visual amenity as a result of the Proposal (i.e. there were no ratings of High (adverse), or Moderate–High (adverse)).

1.0 Introduction

1.1 Background

The Transport Access Program is a NSW Government initiative run by Transport for NSW to provide accessible, modern, secure and integrated transport infrastructure across NSW. This Proposal forms part of the Transport Access Program and involves an accessibility upgrade of Killara Station to improve accessibility and amenities for customers. The Proposal is located at Killara Station on the T1 North Shore Line, approximately 12 kms north-west of the Sydney Central Business District (CBD) (refer Figure 1.1).

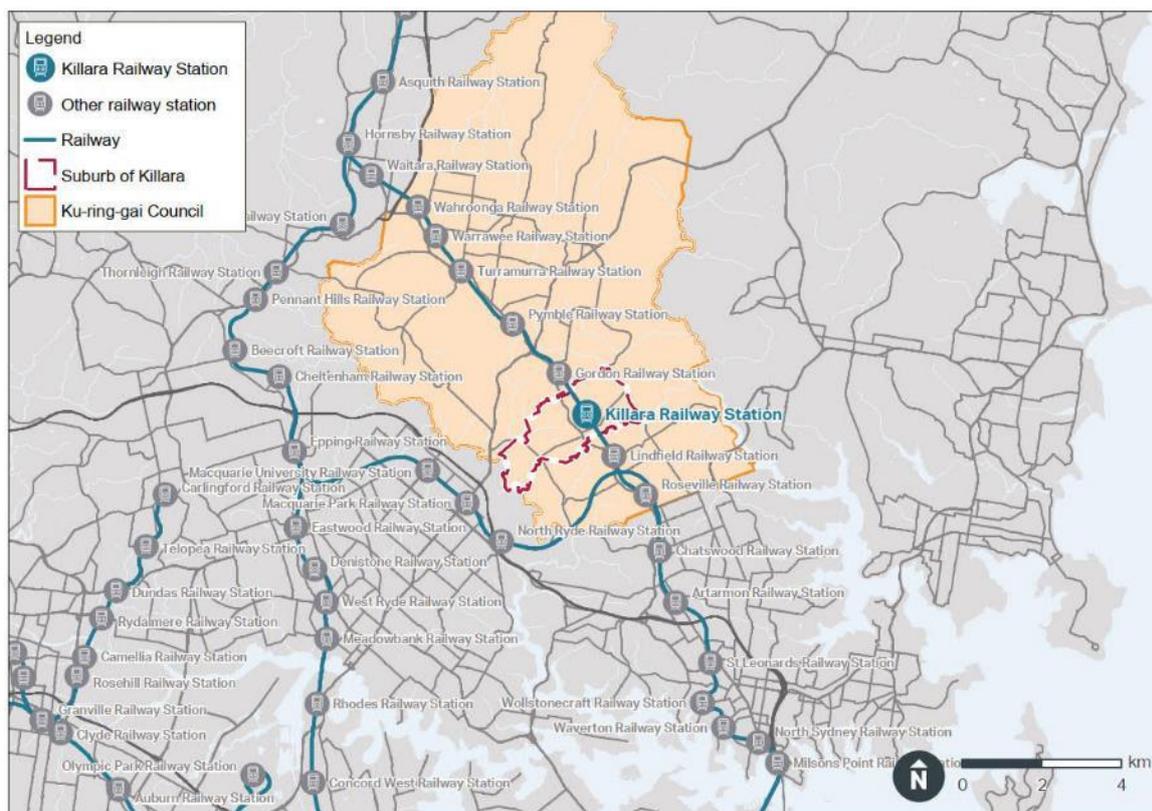


Figure 1.1 Regional context of the Proposal (Source: AECOM)

1.2 Purpose of Technical Report

AECOM has been engaged to prepare a Review of Environmental Factors (REF) for the Proposal, including a Landscape Character and Visual Impact Assessment (LCVIA). The purpose of this LCVIA is to:

- describe the existing landscape character of the Proposal study area and the visibility of the proposed works from the surrounding landscape
- describe the site context and relevant aspects of the Proposal
- identify and describe key existing landscape receivers and representative viewpoints from which the Proposal would be visible
- assess landscape character effects of the Proposal
- assess visual effects of the Proposal
- recommend management and mitigation strategies to minimise any impacts from the Proposal.

Potential changes to landscape character generated by the Proposal at operation have been assessed in detail. Changes to views from the surrounding landscape during construction have been broadly assessed (i.e. no detailed analysis).

For the purposes of this assessment the study area is defined in Section 2.1.

1.3 Proposal overview

The Proposal would include the following key features:

- construction of three new lifts to provide access to the station platforms and existing footbridge, including associated lift landings, canopies, throw screens and support structures
- widening of the existing footbridge to accommodate the new lift landing areas
- provision of seating and canopies at existing boarding assistance zones on the platform
- provision of a new pedestrian crossing, a kiss and ride bay with two spaces (including one accessible space), two new accessible parking spaces and new bike hoops on Culworth Avenue
- upgrade of the existing shelter on Culworth Avenue to provide accessible seating and wheelchair waiting area
- upgrade of existing footpath along Culworth Avenue to provide an accessible pathway to the station entrance from the kiss and ride bay and accessible parking spaces
- re-grading a section of the existing pedestrian footpath along Werona Avenue and provision of a ramp to the existing bus stop
- relocation of existing bike hoops and provision of new bike hoops on Werona Avenue
- reconfiguration of the existing toilet facilities in the station building to provide a family accessible toilet and a unisex ambulant toilet
- ancillary work including platform regrading, minor station building modifications, station power supply upgrade, protection and relocation of services and utilities, new or reinstatement of Tactile Ground Surface Indicators (tactiles) where required, upgrades to stairs, handrails and fencing, new ticketing facilities including additional Opal card readers, improvement to station communication systems (including CCTV cameras) and wayfinding signage.

Figure 1.2 shows the general layout of key elements for the Proposal.

2.0 Methodology

LCVIA is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right, and on people's views and visual amenity.

This LCVIA has been undertaken in accordance with the *Environmental Impacts Assessment Practice Note – Guideline for Landscape Character and Visual Impact Assessment EIA-N04* (Transport for NSW, 2020), with more detailed guidance taken from *Guidelines for Landscape and Visual Impact Assessment, Third Edition* (2013), developed by the Landscape Institute and Institute for Environmental Management, UK (GLVIA3). GLVIA3 is widely recognised as comprising an example of 'best practice' in this field. This report has undertaken an assessment of the Proposal at operation using the methodology described below.

A brief discussion of changes during construction has also been provided.

In accordance with these guidelines, key steps in the assessment of landscape character and visual impact includes:

1. **Contextual analysis** (refer Section 2.2) - analysis of the regional and local context in which the Proposal is located. This includes a desktop assessment to inform the site visit and a description of the existing environment, including the identification of Landscape Character Zones (LCZs)
2. **Landscape character impact assessment** (refer Section 2.3.1) - evaluation of the impact of the Proposal on the LCZs within the study area
3. **Visual impact assessment** (refer Section 2.3.2) - evaluation of the existing views and visual amenity surrounding the Proposal to identify and assess possible impacts placed on the community by the Proposal
4. **Mitigation of impact** – a list of mitigation measures to reduce adverse impacts that the Proposal may impose within the study area.

The following sections outline the detailed methodology undertaken for the preparation of this LCVIA report.

2.1 Study area

The study area is determined based on several factors, including:

- topography of the surrounding landscape
- the number and complexity of LCZs surrounding the Proposal
- the visual containment of the Proposal due to the scale of the Proposal in comparison to surrounding built form, landform and vegetation.

A study area comprising a 750 metre radius from the Proposal was selected (refer Figure 2.1). This was considered conservative given the gently sloping topography, the modest built form of the station and the visual screening provided by vegetation within the rail corridor and adjacent built form.

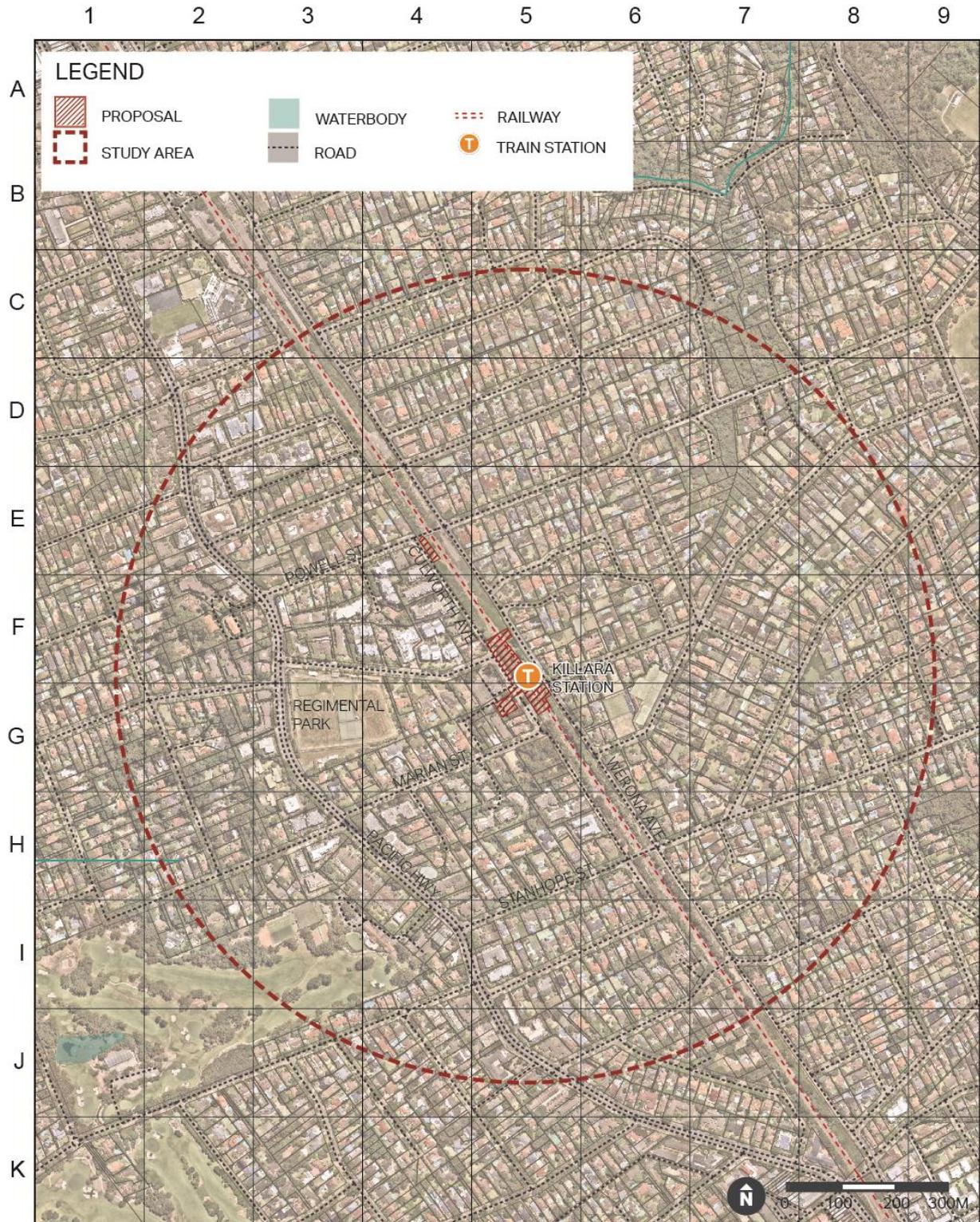


Figure 2.1 Study area and Proposal area (Source: AECOM)

2.2 Existing environment

The existing environment section includes a broad description of the landscape within which the Proposal is located which is used for identification of elements and features relevant to assessment of the Proposal, including site setting, topography, land use, landscape and heritage values. This section was compiled using the following methodology:

2.2.1 Desktop analysis of Proposal landscape and visual resources

Existing data was gathered and reviewed, including:

- available information on sensitive visual receivers, Proposal design, and photos of similar examples of key infrastructure elements proposed
- GIS mapping, including visual envelope mapping, zoning and land use, topography and heritage information (zoning and heritage mapping sourced from Ku-ring-gai Local Environmental Plan 2015 (Ku-ring-gai LEP), mapping produced using ArcMap version 10.8)
- Preliminary heritage information, including *Killara Station Precinct and Commuter Car Park Upgrade Stage 1 Historic Heritage Assessment* (AECOM, 2015)
- Google Earth and Google Street View.

Using this data, a preliminary assessment of the landscape and visual resource was undertaken and used to inform a subsequent site inspection.

2.2.2 Site inspection

A site inspection was undertaken by AECOM on Tuesday the 6th of April 2021. The purpose of the inspection was to:

- identify views from sensitive visual receivers within publicly accessible locations
- assess landscape character
- undertake site photography to record key views and landscape character.

2.2.3 Landscape Character Zones

Drawing from the above, a landscape character assessment was undertaken. This identifies what makes a place distinctive, without necessarily assigning a value to it. It considers the way different components of the environment – both natural (the influences of topography, geology, soils, climate, flora and fauna), and cultural (the historical and current impact of land use, settlement, enclosure and other human interventions) – interact together and are perceived to form a distinct pattern, which gives its particular sense of place.

To provide a framework for more clearly describing the area, and assessing how the Proposal would affect the elements that make up the landscape (including the aesthetic and perceptual aspects of the landscape and its distinctive character), distinct parts of the overall landscape have been separately defined and mapped as LCZs.

2.3 Impact assessment

2.3.1 Landscape effects

Assessment of landscape effects considers the effect of change and development on landscape as a resource in its own right. Landscape effects are assessed at operation of the Proposal.

The consideration of potential impacts on landscape character is determined based on the existing landscape's sensitivity to change, and the magnitude of change that is likely to occur. The sensitivity of a landscape is judged on the extent to which it can accept change of a particular type and scale without adverse effects on existing landscape character. The magnitude of change to landscape character depends on the nature, scale and duration of the change that is expected to occur.

The sensitivity and magnitude of landscape effects address the following specific criteria:

- sensitivity of landscape to proposed change, based on:
 - susceptibility to change – this means the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular LCZ, or an individual element and/or feature, or a particular aesthetic and perceptual aspect) to accommodate the Proposal without undue consequences for the maintenance of the existing situation, and/or the achievement of landscape planning policies and strategies
 - value of landscape
- magnitude of landscape effect, based on:
 - size or scale of change
 - geographical extent of effects
 - duration and reversibility of effects.

Using the criteria listed above, the extent of sensitivity and magnitude are each assessed and graded as being High, Moderate, Low or Negligible. The Landscape Character and Visual Impact Grading Matrix is then used to combine the ratings for sensitivity and magnitude (refer Table 2.1) to determine an overall ‘Significance of Landscape Effects’ finding of High, High to Moderate, Moderate, Moderate to Low, Low or Negligible in relation to the existing environment. Overall impact ratings of High and High to Moderate are considered to be significant.

Table 2.1 Landscape Character and Visual Impact Grading Matrix (Source: GLVIA3 and Environmental Impacts Assessment Practice Note – Guideline for Landscape Character and Visual Impact Assessment EIA-N04 (Transport for NSW, 2020))

		Magnitude			
		High	Moderate	Low	Negligible
Sensitivity	High	High	High to Moderate	Moderate	Negligible
	Moderate	High to Moderate	Moderate	Moderate to Low	Negligible
	Low	Moderate	Moderate to Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

2.3.2 Visual effects

2.3.2.1 Zone of Theoretical Visibility

The likely visibility of the Proposal, once operational, from surrounding areas has been broadly mapped to define a visual envelope or Zone of Theoretical Visibility (ZTV). This provides an indication of the area from which the Proposal may be viewed taking into account topography only (i.e. the mapping does not consider vegetation and built form which may screen the Proposal). The mapping typically shows ‘worst case’, i.e. some receivers may only see a small portion of the Proposal, while other receivers may view a more substantial part of the Proposal. Mapping is produced using the ‘viewshed’ function in ArcMap version 10.8.

2.3.2.2 Representative visual receivers and viewpoints

Potential visual receivers were identified within the ZTV. These were then used to identify a series of viewpoints from which to assess the visual effects due to the Proposal. Factors such as proximity to the changes, number of visual receivers at each location, and the type of visual receivers were taken into account to select the viewpoints. Viewpoints were chosen to assess the changes from publicly accessible locations, although some viewpoints were used to approximate the changes seen from private locations such as residences or community facilities.

2.3.2.3 Visual impact assessment

The assessment of visual impacts addresses the effects of change and development on the views available to people and their visual amenity. It assesses how the surroundings of individuals or groups of people may be specifically affected by changes in the context and character of views as a result of the change or loss of existing elements of the landscape and/or the introduction of new elements. Visual effects of the Proposal have been assessed at operation using the following method.

The evaluation of potential effects on visual amenity is based on the sensitivity of the viewpoint (and the visual receivers it represents) to change, and the magnitude of change arising from the Proposal that is likely to occur.

The sensitivity of each viewpoint is mainly a function of:

- the occupation or activity of the people experiencing the view at particular locations
- the extent to which their attention or interest may therefore be focused on the views and the visual amenity they experience at particular locations, for example:
 - people who are engaged in outdoor recreation where their attention or interest is likely to be focused on views and the visual amenity they experience are likely to be more sensitive to a proposed change in that view, rather than
 - people at their place of work whose attention may be focused on their work, not on their surroundings, and where the setting is not important to the quality of working life
- value attached to the view experienced, for example:
 - value in relation to heritage assets or through planning designations
 - indicators of value attached to views, e.g. through appearing on tourist maps, or provision of facilities for their enjoyment (such as parking places, sign boards and interpretative material).

The magnitude of change to views and visual amenity depends on:

- size or scale of change in the view with regard to the:
 - loss or addition of features in the view and changes in its composition
 - degree of contrast or integration of any new features with the existing landscape in terms of form, scale and mass, line, height, colour and texture
 - nature of the view of the Proposal in terms of amount of time it would be experienced, and whether the views would be full, partial or glimpses
- geographical extent of the visual effect with different viewpoints including the:
 - angle of view in relation to the main activity of the receptor
 - distance of the viewpoint from the Proposal
 - extent of area over which the changes would be visible
- duration and reversibility of visual effects, for example:
 - duration in terms of short term (0-5 years), medium term (6-15 years) or long term (16-30+ years)
 - reversibility with regard to the prospects and practicality of a proposed change being reversed in a generation, e.g. housing can be considered permanent, but wind energy developments for example are often argued to be reversible since they have a limited life, and could eventually be removed and the land reinstated (GLVIA3, 2013).

Using the criteria listed above, the extent of sensitivity and magnitude for visual effects are measured, with each assessed and graded as being High, Moderate, Low or Negligible. The Landscape and Visual Impact Grading Matrix is then used to combine the ratings for sensitivity and magnitude (refer Table 2.1) to determine an overall 'Significance of Visual Effects'. Overall impact ratings of High and High to Moderate are considered to be significant.

A qualitative assessment rating further assigns a rating to the change in the views seen by receivers. This qualitative assessment is a professional judgement as to whether the visual effects are deemed 'Adverse', 'Neutral' or 'Beneficial' from each viewpoint. This judgement is based on whether the changes would affect the quality of the visual experience of visual receivers, given the nature of the existing views. Importantly, the qualitative assessment rating is secondary to the overall impact rating, thereby a low change in views from a viewpoint with an adverse rating, for example, still remains a minor change but with a slightly adverse outcome.

In addition to assessing the visual impact of the Proposal at operation, a high-level commentary has been provided around likely construction effects of the Proposal. Visual receivers have been considered in terms of the views they are likely to obtain from locations within proximity of the Proposal, including consideration of any key vantage points, e.g. lookouts where there is particular interest in the view.

2.3.3 Photos and Photomontage

Photographs of the view from each viewpoint were used to assist in providing a baseline from which to assess changes arising from the Proposal.

A photomontage was produced to illustrate the proposed changes from key viewpoints, selected during the desktop assessment as viewpoints from which the largest visual effects would potentially be seen. These were prepared by overlaying a 3D model of the Proposal over an existing photograph, removing any structures to be replaced using graphic software.

2.4 Mitigation and management measures

Following on from the assessment of impact on the landscape and visual resource, a set of mitigation measures have been developed aimed at reducing or avoiding adverse impacts of the Proposal on identified sensitive receivers. Mitigation measures typically comprise a range of techniques including, but not limited to, appropriate lighting design, staging or construction method, material and colour selection, and landscape planting.

3.0 Project description

3.1 Station upgrade

Details of the proposed work to take place at the station to improve accessibility and customer experience are provided below:

- installation of three new lifts (and lift landings) connecting to the existing footbridge including:
 - removal of vegetation and the existing seat on Culworth Avenue to accommodate the new lift
 - installation of a new lift to provide access from the Culworth Avenue station entrance to the existing footbridge
 - installation of a new lift to provide access from the Werona Avenue station entrance to the existing footbridge
 - installation of a new lift to provide access from the existing footbridge to the station platforms
 - installation of weather protection canopies at the lift landings
 - removal of the retail kiosk on the existing footbridge to facilitate installation of the new lift
- widening of the existing footbridge to accommodate the new lift landing areas
- provision of seating and canopies at the existing boarding assistance zones
- regrading the platform to achieve compliant gradients
- upgrade of the existing tactiles along the entire length of the platforms.

Proposed work to the station building would include:

- reconfiguration of the existing toilets to include a family accessible toilet and a unisex ambulant toilet
- conversion of the existing storeroom into a communications room.

3.2 Interchange facilities

Interchange upgrade work to improve connectivity within the station precinct would include:

- upgrades to the interchange facilities on the western side of the station (Culworth Avenue) including:
 - conversion of the existing kiss and ride area to a kiss and ride bay with two spaces (including one accessible space) and two accessible parking spaces
 - upgrade of the existing footpath to provide an accessible pathway to the station entrance from the kiss and ride bay and accessible parking spaces
 - provision of 10 new bike hoops
 - provision of a new pedestrian crossing at the existing pedestrian refuge
 - upgrade of the existing shelter on Culworth Avenue to provide accessible seating and wheelchair waiting area
 - new pavement around the new lift.
- upgrades to the interchange facilities on the eastern side of the station (Werona Avenue) including:
 - removal of the bench seat located on the raised level of the Werona Avenue bus stop and clearance of landscaped vegetation to install the ramp to the bus stop

- upgrade of a section of the existing footpath on Werona Avenue and provision of a ramp to provide level access from the station entrance to the bus stop including adjustments to existing boundary fencing and new retaining walls
- provision of five new bike hoops at the station entrance
- new pavement around the new lift.

3.3 Ancillary work

Additional ancillary work would include:

- upgrades to lighting and CCTV cameras
- protection and relocation of services and utilities
- electrical upgrades to support the new lifts
- station power supply upgrade work, which could include an upgrade to the existing transformer and earthing/bonding provisions (specific power requirements to be determined during detailed design)
- new fencing and upgrades to existing fencing
- upgrades to the public address (PA) system, including relocating existing speakers and extending the system to the new lift areas
- other work including installation of new opal card readers and relocation of existing opal card readers and wayfinding signage
- relocation and suitable reinstatement of existing infrastructure (e.g. seats, signage, fencing and rubbish bins) which may be required to be temporarily removed to construct the Proposal
- provision of anti-graffiti coating to all new and modified hard surfaces
- landscaping work.

3.4 Materials and finishes

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:

- lift shafts – concrete lift shaft and steel frame
- lift doors – stainless steel
- lift glass – clear
- lift roof and canopies – consistent or complementary with station roofing
- platform – asphalt
- footpath – concrete.

3.5 Construction and ancillary facilities

Subject to approval, construction is expected to commence in late 2021 and take around 18 months to complete. The construction methodology would be further developed during the detailed design of the Proposal by the nominated Contractor in consultation with Transport for NSW.

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 within the council car park off Culworth Avenue (refer Figure 3.1). The area nominated for the compound is on land owned by Ku-ring-gai Council and comprises timed parking.

Two additional temporary areas for laydown and storage have been proposed on the corner of Culworth Avenue and Powell Street (refer to Figure 3.1). These areas are located within the rail corridor to the west of the rail line.

Other areas within the rail corridor may also be used for short term temporary laydown during rail shutdown periods. These areas would not be used outside of rail shutdown periods.

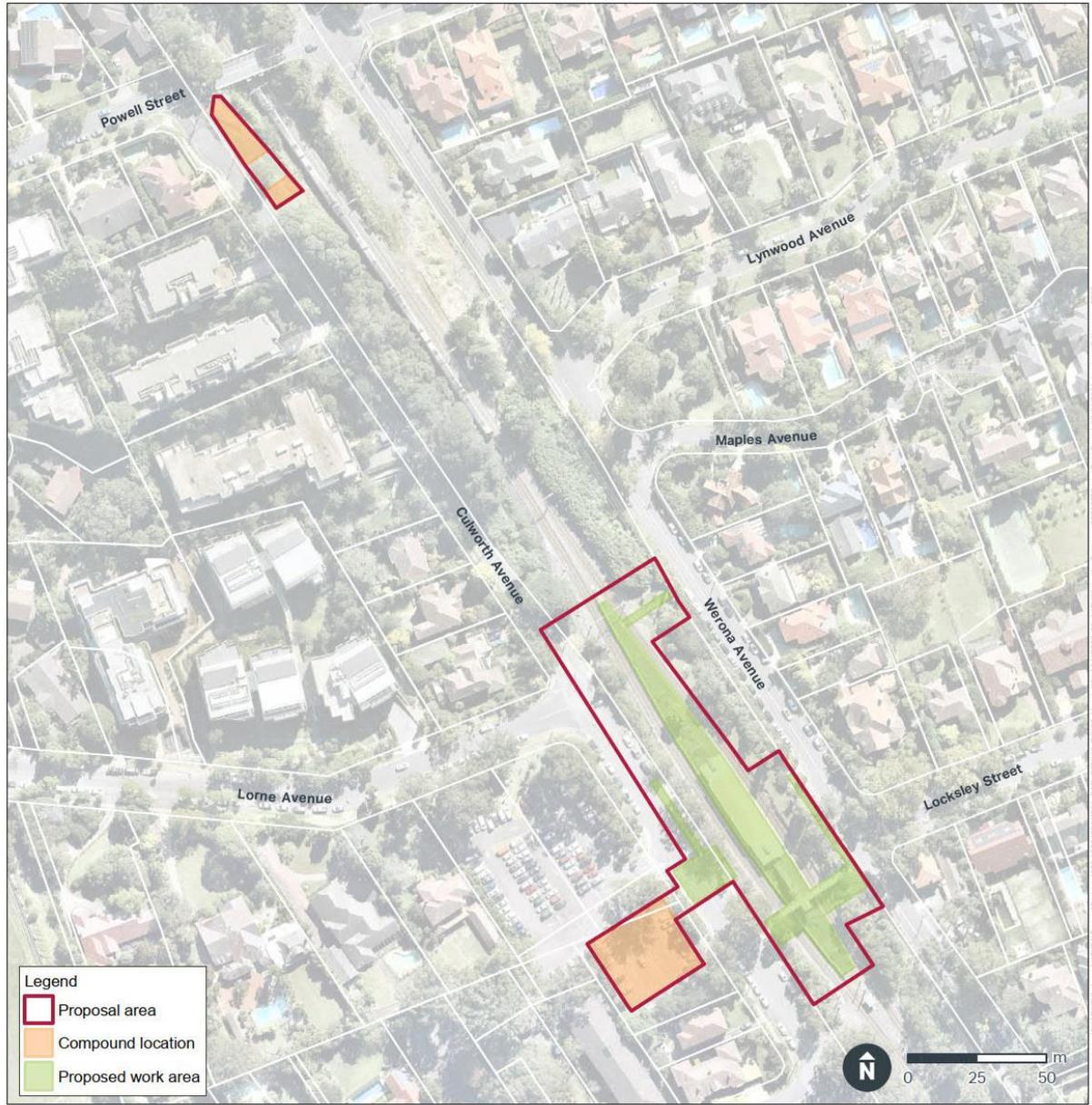


Figure 3.1 Proposal construction area (Source: AECOM)

4.0 Existing environment

4.1 Site context

The Proposal is located at Killara Station on the T1 North Shore Line, approximately 12 kms north-west of the Sydney CBD. Chatswood Station is the closest major rail interchange (approximately 3.8 kms south-east of Killara Station), where the T1 North Shore and Western Line intersects with the T9 Northern Line (which heads north to the Central Coast and Newcastle via Epping) and the Metro North West Line (which heads west to Tallawong via Epping). Killara Station lies between Gordon Station to the north and Lindfield Station to the south.

Killara Station is a small suburban station, comprising one island platform positioned between the north and south bound tracks (refer Figure 4.1). The platform has one station building positioned roughly in the middle of the platform to the north of the footbridge. Access to the station platform is via the footbridge which links with the streets to the east (Werona Avenue) and west (Culworth Avenue) of the rail corridor. The station and tracks are almost level with the eastern side of the rail corridor (Werona Avenue), but at a lower elevation to the western side (Culworth Avenue). A steep, shotcrete-lined batter mitigates the level change between Culworth Avenue and the tracks.

The 750 metre radial study area (refer Figure 4.2) from the Proposal was considered conservative given the topography, surrounding built form and tall vegetation within the streetscapes and private properties in the study area.



Figure 4.1 The view from the footbridge looking south along the rail line (left image) and north along the rail line (right image) at Killara Station (Source: AECOM)

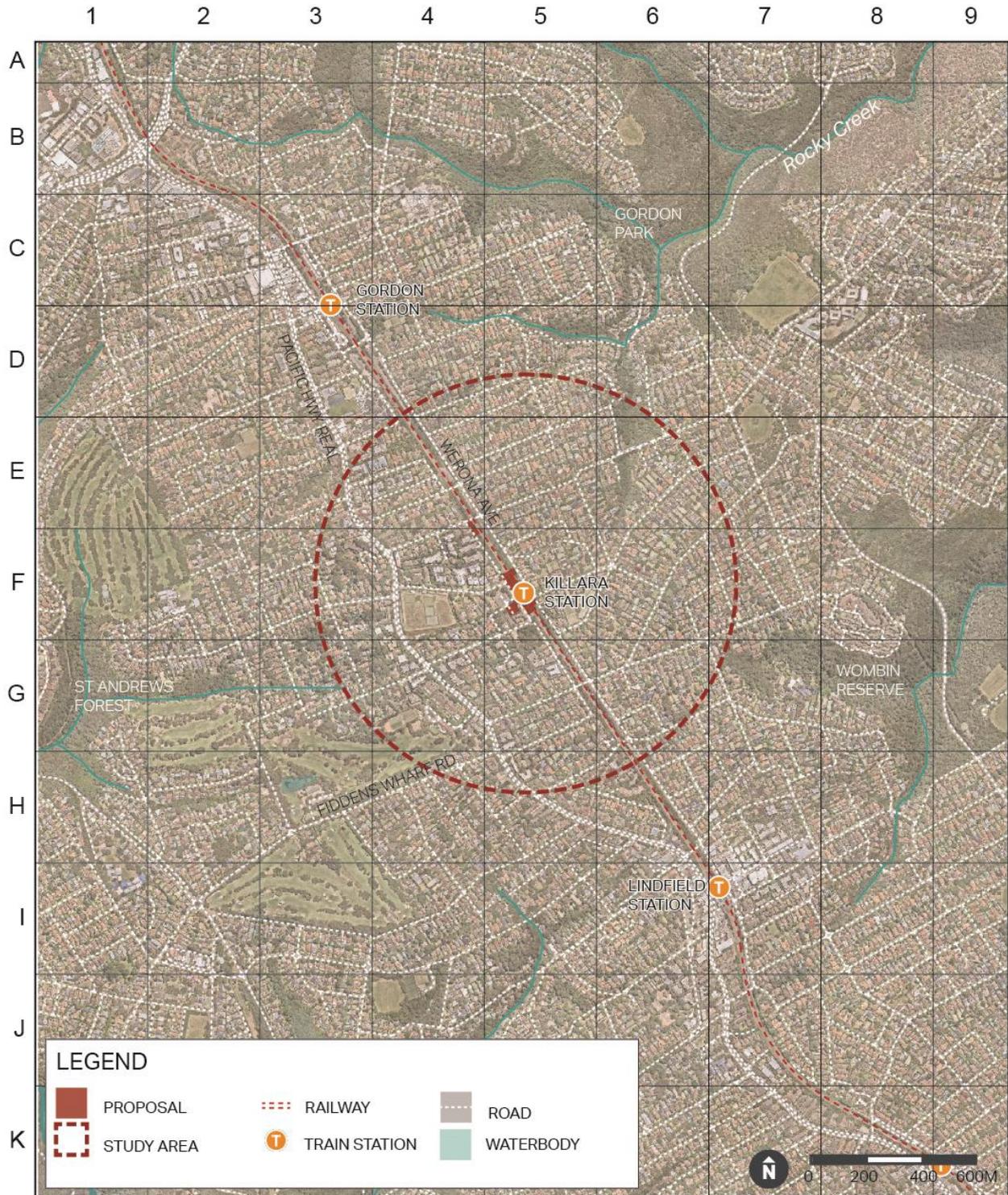


Figure 4.2 Site context and study area (Source: AECOM)

4.2 Topography and hydrology

The topography and hydrology within the study area is shown in Figure 4.3.

The dominant topographical feature within the study area is the wide ridgeline that spans between the Pacific Highway on the western edge and the rail corridor and Werona Avenue to the east. The landscape slopes steeply to the west on the western side of the Pacific Highway, and more gently to the east from the Highway. A drainage corridor lies to the east of Killara Station heading north east. A secondary ridgeline extends north east from south of Killara Station, approximately following Stanhope and Springdale Roads. There are no creeks or rivers within the study area, although the area surrounding Killara Station drains to the north east through existing stormwater drainage infrastructure.

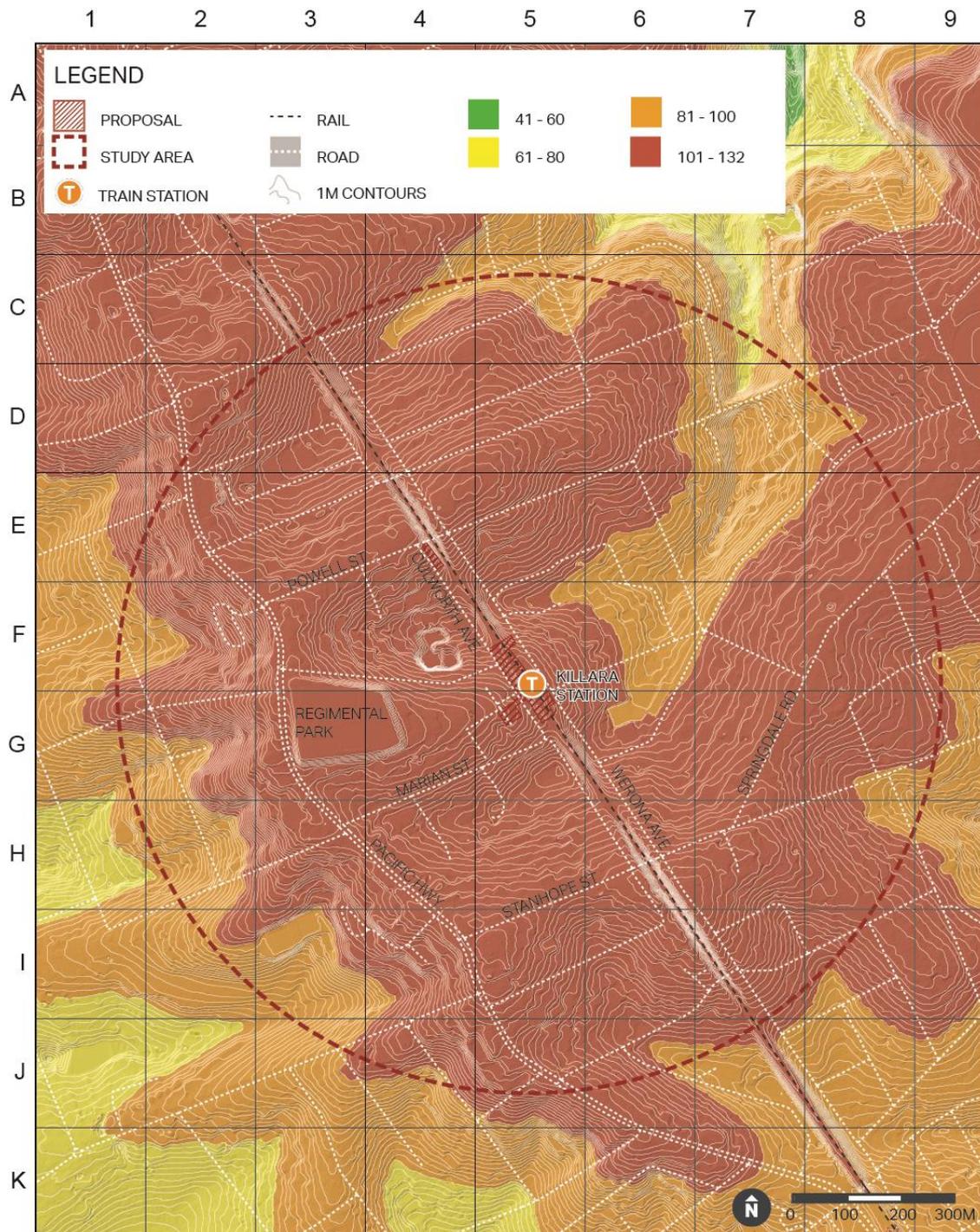


Figure 4.3 Topography within the study area (Source: AECOM)

4.3 Land use

Figure 4.4 shows the land zoning within the study area under the Ku-ring-gai LEP.

To the east of the rail corridor, land is primarily zoned R2 Low Density Residential, with only one small pocket of RE1 Public Recreation near the station and E2 Environmental Conservation in the lower portion of a drainage corridor.

To the west of the rail corridor there is a mix of R4 High Density Residential and R2 Low Density Residential development, with a band of R4 fringing the Pacific Highway. Small pockets of RE1 Public Recreation and B1 Neighbourhood Centre are clustered near Killara Station, with a strip of B2 Local Centre development adjacent to the Pacific Highway in the north west corner of the study area.

The Pacific Highway and the rail corridor are zoned SP2 Infrastructure, along with a large sports field complex on the corner of the Pacific Highway and Lorne Avenue (Regimental Park).

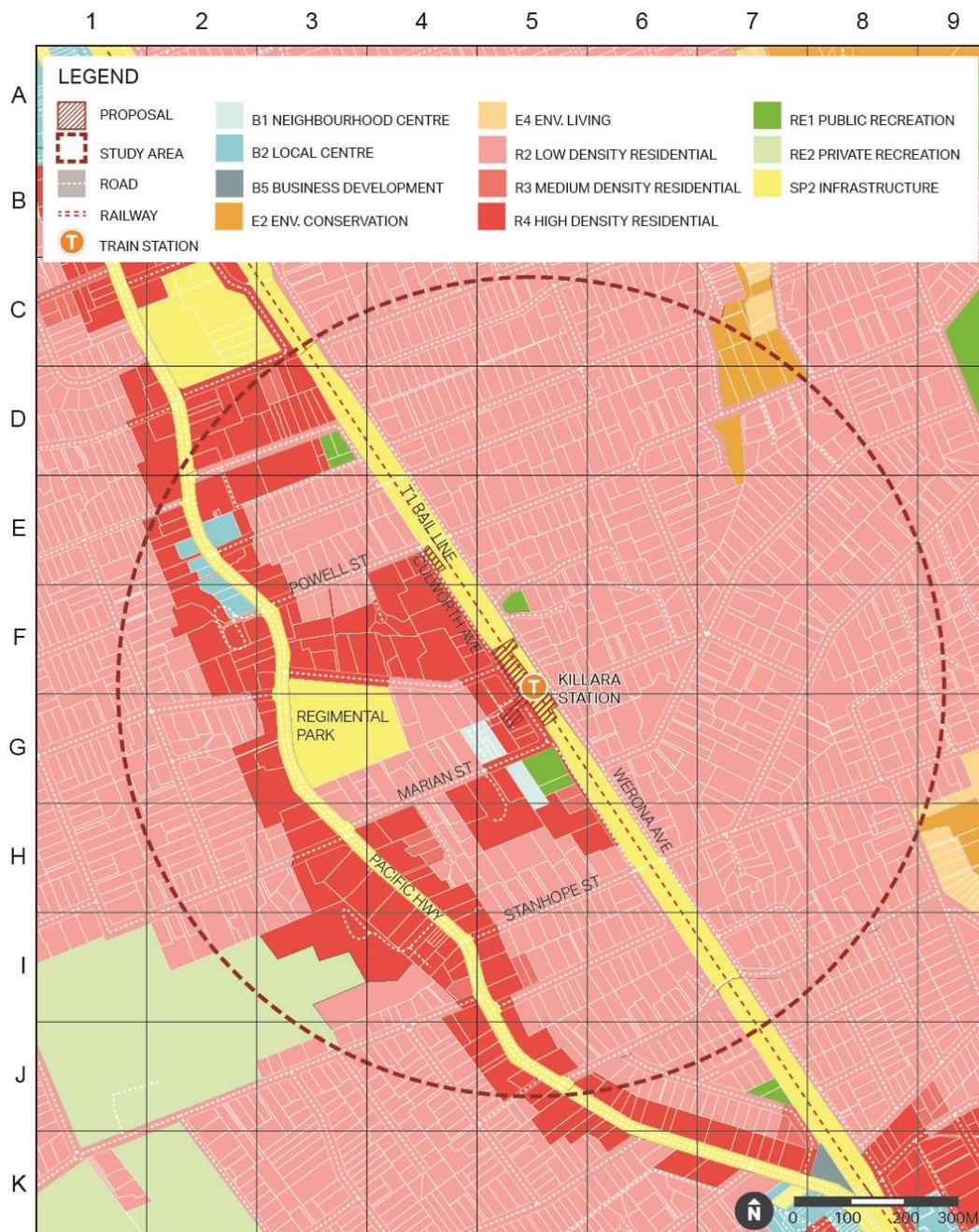


Figure 4.4 Ku-ring-gai LEP land zoning within the study area (Source: AECOM)

4.4 Vegetation

Vegetation cover within the study area is shown in Figure 4.5 and predominantly comprises Urban Native and Exotic Cover. Patches of Blue Gum High Forest are scattered along the ridgeline running in a north – south direction, particularly west of the Pacific Highway. Patches of Blue Gum High Forest vegetation are also dotted around Killara Station, including a large patch to the south of the station. Lower areas in the northeast portion of the study area include patches of Ironbark Forest, particularly along drainage corridors.

The large number of big trees and remnant patches of bush are characteristic of the area.



Figure 4.5 Vegetation within the study area (Source: AECOM)

4.5 Non-Indigenous heritage

Within the Proposal area, Killara Railway Station is listed on Transport Asset Holding Entity of New South Wales Section 170 Heritage and Conservation Register as an item of local significance and on Ku-ring-gai LEP as having local heritage significance. The station holds historical, aesthetic, social and representative significance as an example of a typical suburban station with associated ornamental gardens, with relatively little change to the overall appearance and setting. The gardens are said to contribute to the character of the North Shore.

Within the study area there is one state-significant heritage item: 'Woodlands' residence at 1 Werona Avenue, Killara (refer Figure 4.6). This property lies approximately 550 m south east of Killara Station and is unlikely to be affected by the Proposal.

Opposite Killara Station on the corner of Werona Avenue and Locksley Street is the former Killara Post Office building, which is listed as being an item of local heritage significance within the Ku-ring-gai LEP. The building remains vacant.

Several Heritage Conservation Areas (HCAs) identified on the Ku-ring-gai LEP lie within the study area (refer Figure 4.6), each containing many locally significant heritage items. HCAs surrounding the station include:

- **Lynwood Avenue Conservation Area – C23**
This area has aesthetic significance for the highly intact and cohesive late Nineteenth Century to late Twentieth Century Federation and Inter-war development
- **Greengate Conservation Area – C20**
Early Twentieth Century subdivision. This HCA contains housing in the Arts and Craft and Bungalow Styles
- **Marian Street Conservation Area – C24**
Contains examples of single detached houses from the Federation, Inter-war and Post-war periods. The built context is enhanced by large garden settings, wide street proportions, street plantings and remnant and planted native trees which are elements synonymous with the Ku-ring-gai area. It retains an emphasis on residential, recreational and cultural development
- **Springdale Conservation Area – C1**
Medium to large lots with well-established gardens. The houses are almost exclusively detached residences, with architectural styles including Federation Queen Anne, Arts and Craft, Inter-war Old English, Spanish Mission, Mediterranean and Californian Bungalow. Many houses retain period landscape features including sweeping drives, borders of mixed shrubberies and planted out beds.

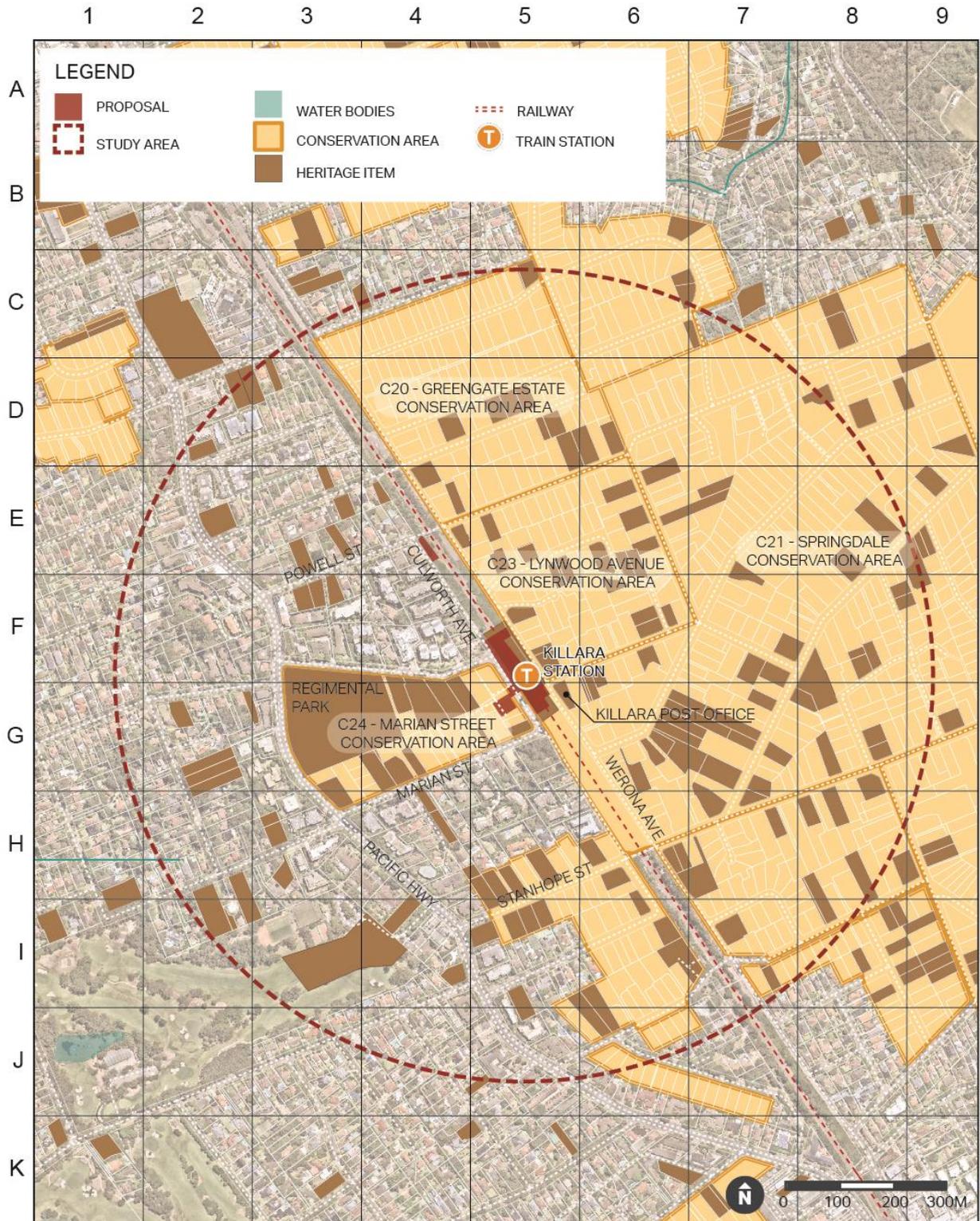


Figure 4.6 Ku-ring-gai LEP listed heritage items within the study area (Source: AECOM)

4.6 Landscape Character Zones

Six (6) LCZs have been identified within the study area (refer Figure 4.7):

- LCZ 1: Rail Corridor
- LCZ 2: Major Road Corridor
- LCZ 3: High Density Residential
- LCZ 4: Low Density Residential
- LCZ 5: Public Open Space
- LCZ 6: Commercial.

While these six LCZs have been identified, changes due to the Proposal:

- only occur within one LCZ (LCZ 1)
- lie within close proximity of three other LCZs (LCZ 3, LCZ 4 and LCZ 6).

The Proposal would result in no changes to LCZ 2 and LCZ 5 due to their distance from the Proposal and/or screening by built form, topography and vegetation, therefore these, while identified within the study area, have not been described in detail or assessed in this report.

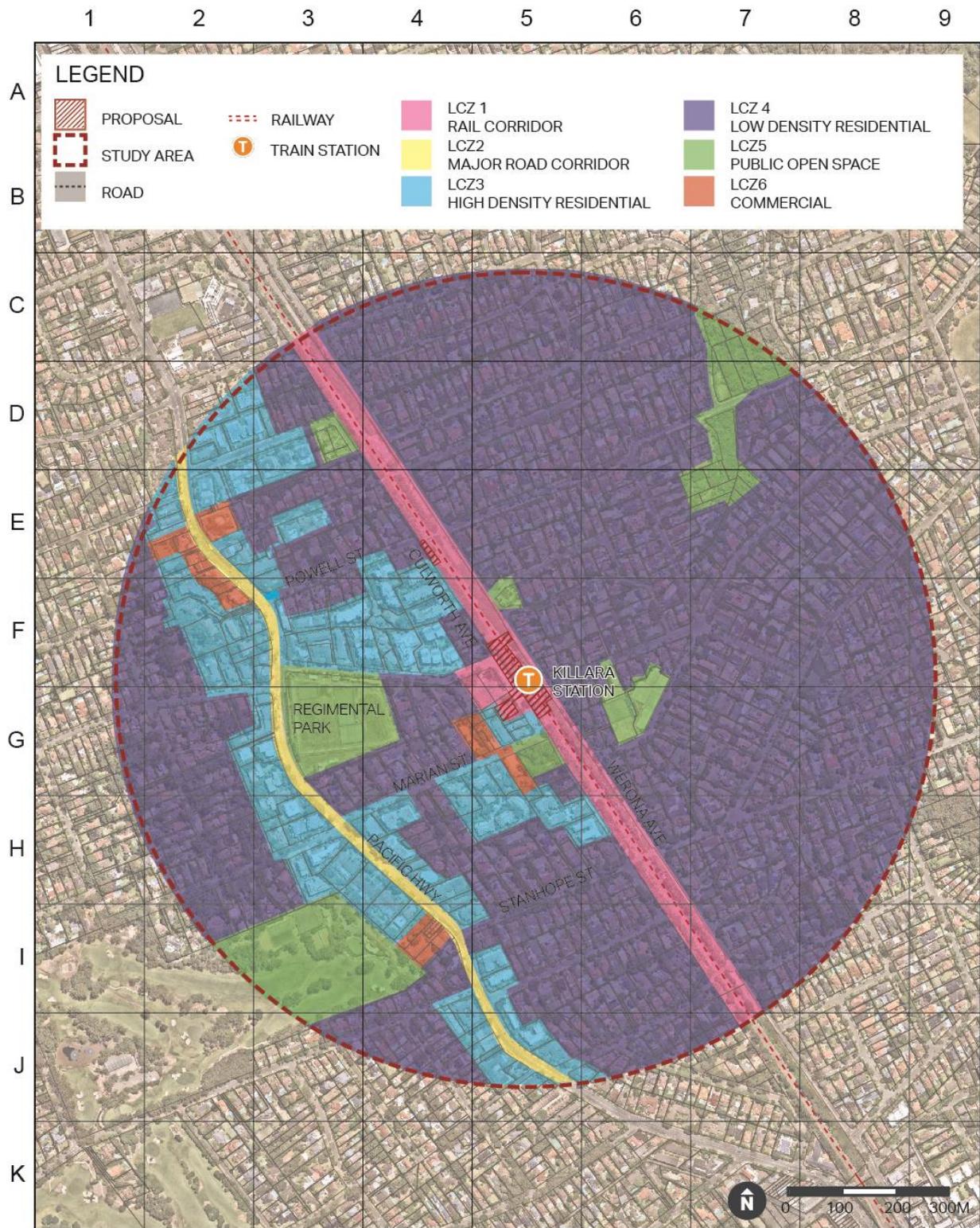


Figure 4.7 Landscape Character Zones within the study area (Source: AECOM)

4.6.1 LCZ 1: Rail Corridor

LCZ 1 typically comprises a linear, functional rail corridor, widening at stations. Other than at the stations, the corridor effectively contains only essential infrastructure such as the rail lines, electrical infrastructure (including overhead wires, gantries, substations and switching sheds), intermittent sheds and limited storage of materials such as stockpiles of rail ballast. The rail corridor is fenced along its entirety.

The tracks are relatively flat with a gentle, even grade. The land on either side of the corridor often lies above or below the level of the tracks, with the edges of the rail corridor steeply battered to mitigate the level difference (refer Figure 4.8). In some places the tracks lie approximately at grade with the surrounding environment.



Figure 4.8 A shotcrete-lined batter mitigates the level change between the tracks and the adjoining road at Killara Station (Source: AECOM)

Typically, the tracks are screened from the surrounding environment outside the rail corridor with dense, sometimes invasive vegetation (refer Figure 4.9). While the tracks are often screened, rail infrastructure such as overhead wiring and gantries can often be seen. In a few areas there is little to no screening along the corridor edge, where the vegetation is low or the rail corridor is too narrow to support screening vegetation or the tracks are at a similar level to the surrounding environment.

At Killara Station, the vegetation fringing the rail corridor contains several large, pale trunked Sydney Blue Gums (*Eucalyptus saligna*), which are an important tree within the local vegetation community Sydney Blue Gum Forest.

At stations on the rail network, the landscape adjoining the tracks is typically more formal in design and often well maintained, as seen in the gardens to the east of the station platform at Killara Station (refer Figure 4.10). These gardens are an important element of the heritage listing of Killara Station, particularly as the 'gardens are said to contribute to the character of the North Shore' (*Killara Station Precinct and Commuter Car Park Upgrade Stage 1 Historic Heritage Assessment* (AECOM, 2015)).

This LCZ contains a number of items of heritage importance. Within the study area the listed items include Killara Station and the gardens to the east of the platform and tracks. The formal, well maintained gardens contribute to the character of the station at this location and comprise a sweeping lawn area fringed by an edging of neat, clipped shrubs and unusual trees (including a mature Queensland Firewheel Tree (*Stenocarpus sinuatus*) and an Illawarra Flame Tree (*Brachychiton acerifolius*), multiple mature Camellias and a mature Lemon Myrtle (*Backhousia citriodora*)).



Figure 4.9 The rail corridor is flanked by dense vegetation either side of the tracks, visually screening the rail tracks and passing trains from the landscape beyond (Source: AECOM)

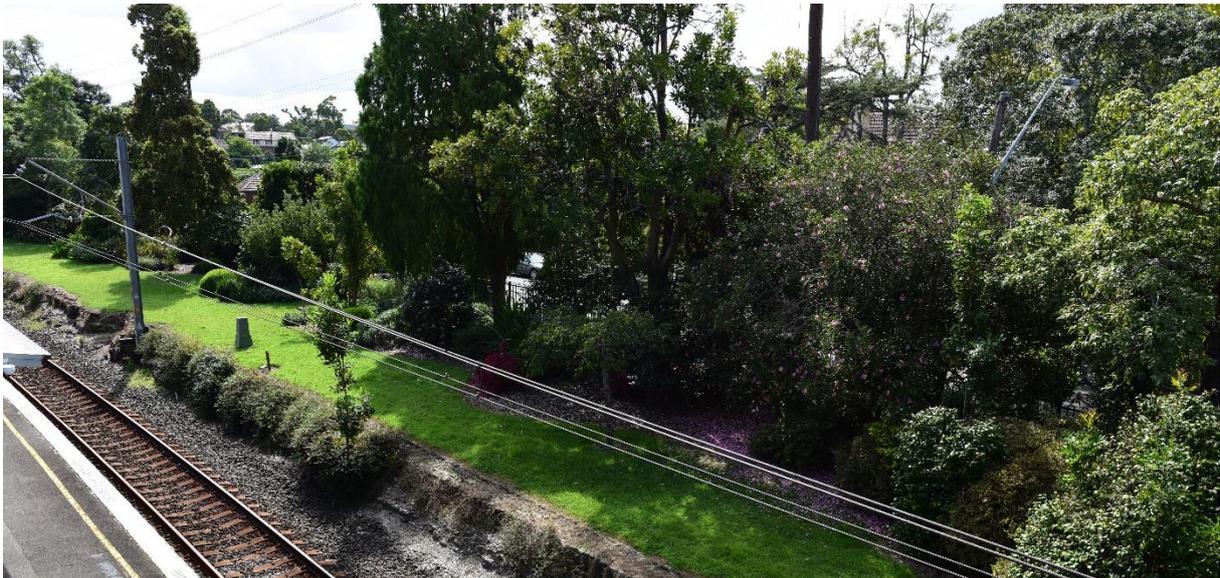


Figure 4.10 A well designed and maintained garden at Killara Station opposite the platform to the east of the tracks (Source: AECOM)

The rail corridor widens at stations to include support infrastructure such as commuter car parking. Figure 4.11 shows an example of this at Killara Station. Off street parking and other rail infrastructure are typically surrounded by screening vegetation.



Figure 4.11 Commuter car parking at Killara Station (Source: AECOM)

4.6.2 LCZ 3: High Density Residential

This LCZ comprises areas of high-density residential apartment buildings typically zoned R4 High Density Residential and is located west of the rail corridor typically clustered either side of the Pacific Highway within the study area.

High density apartment blocks typically front wide streets and comprise a mix of older and new developments. Older apartments are often red or yellow brick two or three storey apartment blocks constructed between the 1950s and 1970s. Buildings are typically simple in architectural style and are set back from the road by landscaped gardens including lawns surrounded by tall hedges and mature trees (refer Figure 4.12). Parking is provided often at the rear of the property in designated parking areas.

Apartment blocks along the Pacific Highway often have tall brick fencing and entry gates and multiple apartment buildings per development lot, while apartments on quieter streets are more often one apartment building per lot, as shown in Figure 4.12.



Figure 4.12 Typical example of older red-brick apartments within the study area (Source: AECOM)

Newer apartment blocks tend to be constructed on larger lots and are typically rendered block construction with balconies fronting the road. Underground parking and landscaped gardens are typical of newer developments within the study area (refer Figure 4.13).



Figure 4.13 Typical example of new residential flats within the study area (Source: AECOM)

The street network within high density residential areas comprises a rough grid, often responding to the topography of the landscape, particularly in relation to the Pacific Highway and streets perpendicular to it. Lots are large, sometimes oddly shaped where a number of smaller low-density residential lots have been amalgamated by a developer as the residential density of living has increased. Streets often contain mature native and exotic street trees.

High density residential developments are not typically heritage items, although parts of this LCZ lie within HCAs. They do not contribute to the heritage characteristics of the area.

4.6.3 LCZ 4: Low Density Residential

This LCZ is the highest represented LCZ within the study area, occurring east of the rail corridor and east of Killara Station. Between the rail corridor and the Pacific Highway smaller patches of the LCZ are located, interspersed with blocks of LCZ 3: High Density Residential and occasional large parks and community facilities. West of the band of LCZ 3: High Density Residential that follows the Pacific Highway, more LCZ 4 is located.

Figure 4.14 shows a typical streetscape within this LCZ in the study area.



Figure 4.14 Wide streets with ample on-road parking within the study area (Source: Google Street View)

The street network is arranged in a grid. Wide streets with one lane travelling in each direction and provision for parking on either side of the road are often lined with mature native and exotic street trees. Footpaths are positioned on one or both street verges.

The character of this LCZ is highly influenced by the high percentage of older housing which has been retained. This is in part due to the Heritage Conservation Areas within the LCZ (refer to Section 4.5).

Housing types present represent the varied architectural styles of the periods, including Federation Queen Anne, Arts and Craft, Inter-war, Old English, Spanish Mission, Mediterranean and Californian Bungalows. Many of the homes are architecturally designed. Mature native and introduced trees, on private property and as street trees, add to the high visual quality of the area. Many houses retain period landscape features including sweeping drives, borders of mixed shrubberies and planted out beds.

Housing is typically set back from the road with mature landscaped gardens and low front fences fronting the streets (refer Figure 4.15). Lots are typically quite large for low density residential housing and often have pools and tennis courts within the rear of the property.



Figure 4.15 An example of a residence which is a local heritage item within the study area opposite Killara Station
(Source: AECOM)

4.6.4 LCZ 6: Commercial

Within the study area the LCZ either comprises small clusters of individual commercial blocks (such as the Marian Street theatre and café cluster near Killara Station) or strips of commercial development along a main road (such as on the Pacific Highway near the Greengate Hotel).

On the Pacific Highway this LCZ is represented by a strip of commercial properties on either side of the road (refer Figure 4.16) including restaurants and shops or services such as a mechanic. Shops are typically positioned close to the road corridor adjacent to the footpath. Some off-street parking is provided in blocks, with some timed on-street parking outside the properties.



Figure 4.16 Commercial properties are positioned on either side of the Pacific Highway, with built form positioned next to the footpath and with some off-street parking provided (Source: Google Street View)

Built form is typically either rows of attached terrace-style shops with parking areas positioned providing breaks in the commercial properties. Other built form comprises detached buildings, some of which are repurposed residential housing and others, such as the Greengate Hotel (refer Figure 4.17), which are purpose built. Detached buildings are often set back further from the road by simply landscaped front courtyards. Parking is sometimes provided onsite, often at the rear of the properties.



Figure 4.17 The Greengate Hotel on the Pacific Highway (Source: Google Street View)

Within the study area the LCZ contains heritage items, including the Greengate Hotel, which is a locally listed item. Parts of the LCZ also lie within a HCA on Marian Street.

5.0 Landscape character impact assessment

This section provides an assessment of landscape character impacts for each LCZ during operation of the Proposal.

5.1 LCZ 1: Rail Corridor

The potential effects of change on LCZ 1 are described in Table 5.1.

Table 5.1 LCZ 1: Rail Corridor - Landscape Character Impact Assessment

LCZ 1 – Rail Corridor
<p>Anticipated change</p> <p>Key visible changes due to the Proposal would include:</p> <ul style="list-style-type: none"> • installation of three new lifts (including lift landings and canopies) connecting the existing footbridge to the Culworth Avenue station entrance, the Werona Avenue station entrance and connecting the existing footbridge to the station platforms • removal of the retail kiosk on the existing footbridge to facilitate installation of the new lift • removal of vegetation on the southern side of the existing footbridge on either side of the rail corridor to facilitate installation of the new lifts • widening of the existing footbridge to accommodate the new lift landing areas • provision of seating and canopies at the existing boarding assistance zones on the platform • regrading the platform to achieve compliant gradients • upgrade of the existing tactiles along the entire length of the platforms • upgrades to the interchange facilities on either side of the station including upgrades of footpaths, provision of bike hoops, accessible car parking spaces and a kiss and ride bay • upgrades to lighting, CCTV cameras, services and utilities, electrical upgrades, fencing, PA system, opal card readers and wayfinding signage • relocation and suitable reinstatement of existing infrastructure (e.g. seats, signage, fencing and rubbish bins) which may be required to be temporarily removed to construct the Proposal • landscaping work.
<p>Sensitivity to change</p> <p>The susceptibility to change of LCZ 1 is influenced as follows:</p> <ul style="list-style-type: none"> • the most visible proposed change is the removal of vegetation, addition of three lift structures, widening of the existing footbridge and upgrade of footpaths on either side of the station • other changes are considered to be visually minor as they comprise the upgrade of existing rail infrastructure, e.g. tactiles upgrades, signage, handrails, resurfacing of footpaths and adjustments to car parking spaces • the station is partially surrounded by vegetation, which would assist in visually reducing the visible bulk of the larger aspects of the proposed changes.

The value of landscape is influenced by the following:

- the heritage importance of items within the LCZ, namely Killara Station
- vegetation within the rail corridor, which is typically valued in urban areas, but especially the gardens at Killara Station which are an important aspect within the heritage listing of the station
- the apparent level of care with which the station precinct is maintained.

Given the above, the sensitivity of LCZ 1 is considered to be Moderate.

Magnitude of change

The magnitude of change for LCZ 1 is influenced by:

- the scale of the proposed changes would be slightly larger than existing infrastructure at the station. The proposed lifts at both ends of the existing footbridge would introduce taller rail infrastructure towards the edges of the rail corridor, while the proposed lift in the centre of the footbridge would visually comprise a similar structure to the existing retail kiosk that would be removed
- the materials proposed would differ from those existing within the station and would visually appear as new elements. However, upgrade of lifts at stations along the rail corridor as part of the Transport Access Program are similar in materiality, which would visually tie these stations together as part of a unified rail character and integrate them into the greater visual character of the LCZ
- the changes would be limited to the station and immediate surrounds, with the geographical extent of the area over which the effects of the larger elements of the Proposal may have an influence, limited to within about 50 metres from the proposed lifts
- only a small proportion of the overall LCZ would be affected by the Proposal, limited to the station and surrounds rather than spread along the rail corridor
- the proposed changes (particularly the proposed lifts) would differ from the established predominant architectural style within the station, however, modernisation of station facilities is a common and ongoing process
- the duration of the Proposal would be long-term, with low potential for reversibility.

Given the above, the magnitude of anticipated change is considered to be Moderate.

Significance of landscape character effect

Using the landscape character grading matrix (refer Table 2.1), the rating of the impact on landscape character is Moderate. The proposed changes predominantly include the upgrade of existing rail infrastructure, with the addition of three larger structures (the lifts). The upgrade of existing rail infrastructure would not result in a change to the character of the LCZ, while the addition of the more modern lifts would result in a minor change in station character.

It is recommended that design elements reference the heritage character of the LCZ, however, maintain the visual quality of a 'new' piece of infrastructure rather than replicating heritage items. The protection of the heritage gardens on the eastern side of the station is recommended to preserve the character of the suburban station within its heritage setting.

5.2 LCZ 3: High Density Residential

The potential effects of change on LCZ 3 are described in Table 5.2.

Table 5.2 LCZ 3: High Density Residential - Landscape Character Impact Assessment

LCZ 3 – High Density Residential
<p>Anticipated change</p> <p>Only a small portion of the proposed works would lie near to a small portion of the LCZ at the southern end of the station on Culworth Avenue. The majority of the LCZ lies to the west of the Proposal. The changes adjacent to the LCZ at Culworth Avenue would not alter the character within the LCZ. It is concluded that the Proposal would not affect the character of LCZ 3: High Density Residential.</p>
<p>Significance of landscape character effect</p> <p>There would be no change in the landscape character of LCZ 3 as a result of the Proposal.</p>

5.3 LCZ 4: Low Density Residential

The potential effects of change on LCZ 4: Low Density Residential are described in Table 5.3.

Table 5.3 LCZ 4: Low Density Residential - Landscape Character Impact Assessment

LCZ 4 – Low Density Residential
<p>Anticipated change</p> <p>Key visible changes due to the Proposal would include:</p> <ul style="list-style-type: none"> • installation of new lifts, particularly the new lift connecting the existing footbridge to Werona Avenue • removal of vegetation on the southern side of the existing footbridge on the eastern side of the rail corridor to facilitate installation of the new lift • regrading of the footpath from the station entrance, provision of a ramp to the bus stop and associated vegetation removal • upgrades to the interchange facilities on the eastern side of the station including upgrades of footpaths and provision of bike hoops • upgrades to lighting, fencing, landscaping and wayfinding signage • relocation and suitable reinstatement of existing infrastructure (e.g. seats, signage, fencing and rubbish bins) which may be required to be temporarily removed to construct the Proposal.
<p>Sensitivity to change</p> <p>The susceptibility to change of LCZ 4 is influenced by the following:</p> <ul style="list-style-type: none"> • few changes would occur within the LCZ, the most visible being the removal of vegetation, addition of one lift, widening of the existing footbridge and the upgrade of footpath on the eastern side of the station • other changes are either contained within the rail corridor and station or considered to be visually minor as they comprise the upgrade or replacement of existing infrastructure, e.g. signage, handrails, bins and seating • The topography, built form and existing vegetation within the road verges and within private properties would lower the susceptibility to change by limiting the visual prominence of the changes. The LCZ would be able to accommodate change without undue consequences providing the change was situated on the boundary of the LCZ, not take up a large portion of the LCZ, or include very large uncharacteristic elements.

The value of landscape is influenced by the following:

- the heritage importance of items within and adjacent to the LCZ and in the vicinity of the station, including several HCAs and local heritage items which include a residence and former post office on the corner of Werona Avenue and Locksley Street
- vegetation along the edge of the rail corridor, which is typically valued in urban areas, but especially the gardens at Killara Station which are an important aspect within the heritage listing of the station. This garden edge contributes to the character of the LCZ at this location.

Given the above, the sensitivity of LCZ 4 is considered to be Moderate.

The magnitude of change for LCZ 4 is influenced by:

- the size and scale of the Proposal is similar to that within the existing road corridor, with the exception of the proposed lifts, which would be positioned in the adjacent LCZ 1
- removal of vegetation on the road verge would visually open up the station slightly to the street, but the vegetated garden edge of the station on the eastern side of the rail corridor would provide a green edge to the rail corridor and would minimise any change in character due to removal of verge vegetation
- proposed changes to the pedestrian footpath are in keeping with the existing character of the footpath and road corridor within the LCZ
- the geographical extent of the changes are very small, limited to the footpath and rail corridor edge directly adjacent to the station.

Given the above, the magnitude of anticipated change is considered to be Low.

Significance of landscape character effect

Using the landscape character grading matrix (refer Table 2.1), the rating of the impact on landscape character is Moderate to Low. The proposed changes predominantly include the upgrade of existing infrastructure within the road corridor and the addition of rail infrastructure within the adjacent rail corridor (LCZ 1). The upgrade of existing rail infrastructure would not result in a change to the character of this LCZ.

While the changes within this LCZ are minimal, the sensitivity of the LCZ lies predominantly in the heritage setting of the residential suburb. Changes to the road verge and station entrance within this context are therefore important, if not substantial. It is recommended that landscaping (including potential planting of street trees or shrubberies, if possible) is considered in the detailed design phase of the Proposal.

5.4 LCZ 6: Commercial

The potential effects of change on LCZ 6 are described in Table 5.4.

Table 5.4 LCZ 6: Commercial Landscape Character Impact Assessment

LCZ 6 – Commercial
<p>Anticipated change</p> <p>No changes due to the Proposal would occur within or adjacent to this LCZ. Minor changes would occur near the LCZ (near Marian Street shops) but would have no impact on the character of LCZ 6: Commercial due to the distance from the Proposal.</p>
<p>Significance of landscape character effect</p> <p>There would be no change in landscape character of LCZ 6 as a result of the Proposal.</p>

6.0 Visual impact assessment

6.1 Visibility of the Proposal

Visible changes resulting from the Proposal include:

- installation of three new lifts (and lift landings)
- widening of the existing footbridge to accommodate the new lift landings
- changes to the footpaths on Culworth Avenue and Werona Avenue, including footpath upgrades, provision of a new ramp to the bus stop on Werona Avenue, the introduction of accessible car parking spaces, a kiss and ride bay, changes to a bus shelter on Culworth Avenue, provision of bike hoops and other amenities
- the provision of a pedestrian crossing and refuge on Culworth Avenue.

Changes to the station itself (including the regrading of platforms and upgrades to station infrastructure on the platform) would be difficult to see from areas beyond the rail corridor due to changes in landform, surrounding built form and planting.

The ZTV map (refer Figure 6.1) shows the theoretical areas that would get views to the Proposal due to the landform alone, i.e. if no built form or vegetation were present. While this map shows extensive theoretical views to the Proposal, the extent of views would be greatly reduced, as discussed below.

At Killara Station the rail corridor is positioned on a gentle slope which falls from a ridgeline running roughly parallel to the Pacific Highway to the east. The station lies between Culworth Avenue to the west and Werona Avenue to the east, with the rail corridor lying parallel between these two roads. The station is at a lower level than Culworth Avenue and roughly at the same height as Werona Avenue.

This landform results in the tallest proposed elements (the three lifts and associated landings) potentially being seen from the immediate surrounds of the station, but also from further distances to the east as the land falls away from the station.

The surrounding landscape is mostly residential development, including areas of medium and high density apartments and older low density residential suburbs. The area has a high proportion of tall trees, both exotic (street trees and trees in private properties associated with older housing within the surrounding HCAs, particularly to the east) and native. Native trees include individual and patches of remnant vegetation.

The station precinct, while elevated above the sloping landscape to the east, is also therefore visually insulated, with views to and from limited by these factors. Views to the station are predominantly seen by visual receivers directly surrounding the station, including receivers passing the station in vehicles.

6.2 Visual receivers

Visual effects of the Proposal are assessed for the following key visual receivers:

- rail commuters accessing or passing through the station
- commuters and passers-by on nearby roads (pedestrians, cyclists, motorists)
- workers or visitors to the nearby business enterprises and community facilities
- residents in adjacent streets to the station to the east and west.

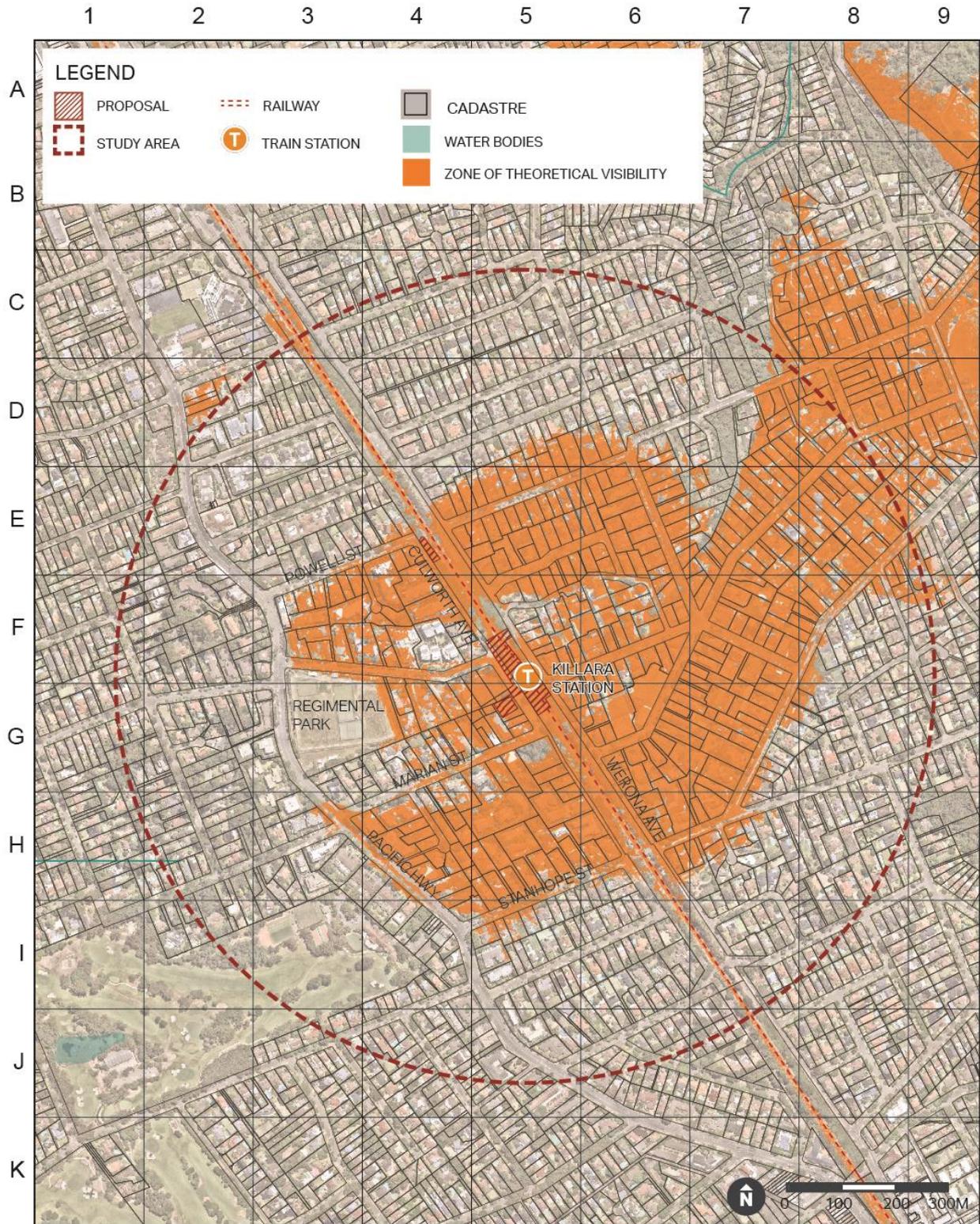


Figure 6.1 Theoretical Zone of Visibility map (Source: AECOM)

6.3 Assessment of construction activity

During construction, visible construction elements would be expected to typically include a range of site sheds, hoardings, plant – including machinery for excavation of lift wells, a crane to place the lifts, and heavy vehicles bringing in and unloading materials.

A temporary construction compound within the council car park off Culworth Avenue would be required to accommodate a site office, amenities, laydown and storage area for materials. Two additional temporary areas for laydown and storage have been proposed on the corner of Culworth Avenue and Powell Street. These areas are located within the rail corridor to the west of the rail line. Other areas within the rail corridor may also be used for short term temporary laydown during rail shutdown periods. These areas would not be used outside of rail shutdown periods.

Other construction activity visible within the surrounding landscape would include an increase in traffic on the local road network associated with construction vehicle movements.

The most visually prominent construction activity would be associated with the construction of the three lifts, widening of the footbridge, upgrade work to the footpath and kerbs / parking areas on Culworth Avenue and Werona Avenue near the station entrance and the construction compounds. Construction on the platform (including changes to the station building, replacement or installation of tactiles and other more minor changes) would be difficult to see outside of the rail corridor and would therefore impact users of the rail facilities rather than the general (non-rail user) public.

The most sensitive visual receivers viewing the construction activity are residential receivers viewing the changes from their homes. These would comprise:

- residents in apartments and houses surrounding (and in some cases overlooking) the council car park on Culworth Avenue
- residents in apartments and houses on Culworth Avenue and Powell Street near the proposed construction compounds on the corner of Culworth Avenue and Powell Street
- residents in houses on Werona Avenue near the station entry.

These receivers would be seeing the changes from close proximity and potentially from within living areas of their homes. This is particularly true of residents in the apartment blocks to the south (refer Figure 6.2) and west (refer Figure 6.3) of the proposed construction compound on Culworth Avenue. However, these few receivers would see the changes through partial screening of existing vegetation surrounding the car park.



Figure 6.2 An apartment block to the south of the council car park where one of the proposed construction compounds would be located (Source: AECOM)



Figure 6.3 An apartment block to the west of the council car park where the proposed construction compound would be located (Source: AECOM)

Two detached residences and one apartment block are located at the corner of Powell Street and Culworth Avenue near the construction compound within the rail corridor. While the two detached residences face the rail corridor (from the opposite side of the road), the apartment block is orientated to the north, with limited chances for viewing the construction activity from within the apartments. Construction activity from these homes would be primarily seen from front gardens and potentially from rooms in upper floors overlooking the rail corridor. The view from Powell Street looking south along Culworth Avenue is shown in Figure 6.4.



Figure 6.4 The view from Powell Street looking south along Culworth Avenue, with the proposed construction compound location (Source: Google Street View)

Residential receivers on Werona Avenue would be unlikely to see the construction activity from within the living areas of their homes due to screening vegetation and fencing surrounding their properties.

Other receptor groups who would be viewing the construction activity include:

- rail commuters accessing the station on foot or passing through the station on trains
- passers-by on Culworth Avenue and Werona Avenue (pedestrians, cyclists, motorists)
- workers or visitors to the nearby business enterprises and community facilities on Marian Street.

Of these receptor groups, a high number of rail commuters and passers-by who would potentially receive the most prolonged and detailed views to the activity, would be seeing the changes as a small part of a greater journey and only for a brief period of time as they moved towards and past the station. These receivers would have a low sensitivity to these changes due to the short distance of time they would see the activity. Workers and visitors to the Marian Street Shops and theatre would not get views directly to the construction activity from the commercial area but may see an increase in traffic on the road.

Overall, views to the construction compounds and other construction activity due to the Proposal are considered to be relatively minor. They would be consistent with similar temporary construction work sites and activities, and transitory over a period of about 18 months until completion of the Proposal. A majority of the receivers would have a low sensitivity to the changes (being passers-by and rail commuters) and there would be a low number of receivers with a higher sensitivity to the changes.

6.4 Assessment of Proposal at operation

6.4.1 Representative viewpoints

Five (5) viewpoints have been chosen to represent the change in views from publicly accessible areas due to the Proposal. The rationale for choice of viewpoints are described in Table 6.1 and their location is shown in Figure 6.5.

Table 6.1 Viewpoints chosen to assess visual impacts due to the Proposal

Viewpoint	Viewpoint rationale	Distance*
Viewpoint 1: Culworth Avenue and Lorne Avenue	Assesses the view from the intersection of Culworth and Lorne Avenues with visual receivers including passers-by and local residents.	120 m
Viewpoint 2: Culworth Avenue council car park	Assesses the view from the pedestrian entry point of the council car park on Culworth Avenue with visual receivers including commuters and passers-by.	25 m
Viewpoint 3: 18 Culworth Avenue	Assesses the view from the apartment block at 18 Culworth Avenue with visual receivers including passers-by and local residents.	35 m
Viewpoint 4: Werona Avenue and Locksley Street	Assesses the view from the intersection of Werona Avenue and Locksley Street with visual receivers including passers-by and local residents. This viewpoint lies adjacent to two heritage items on Werona Avenue.	15 m
Viewpoint 5: 25 Werona Avenue	Assesses the view from 25 Werona Avenue with visual receivers including passers-by and local residents.	50 m

*Distance is measured between the viewpoint to the nearest proposed lift as this is considered to be the most visually prominent proposed change at operation

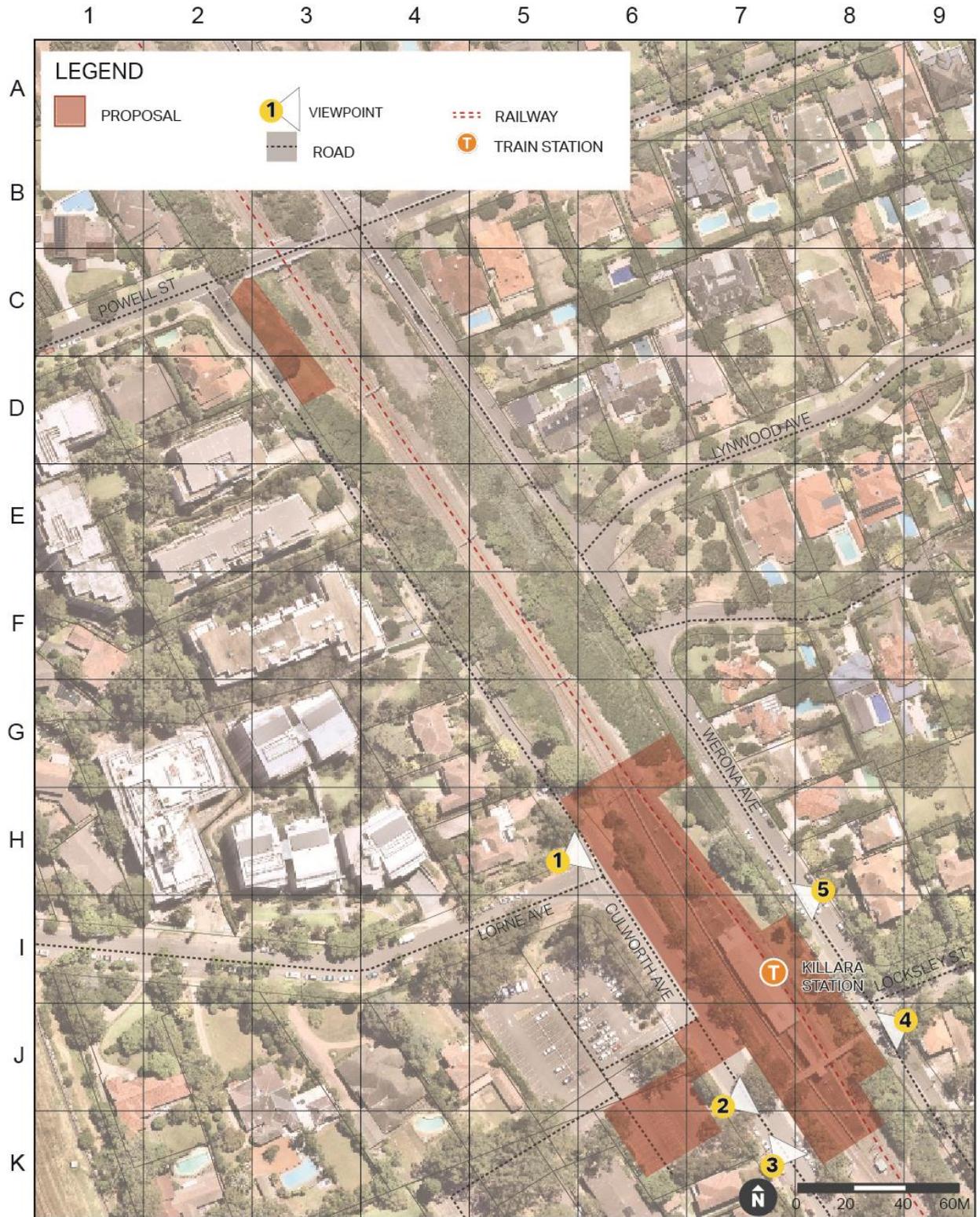


Figure 6.5 Representative viewpoints for visual impact assessment and nearby building height (Source: AECOM)

6.4.2 Assessment of viewpoints

6.4.2.1 Viewpoint 1: Culworth Avenue and Lorne Avenue

This viewpoint was selected to assess changes to the view from the intersection of Culworth and Lorne Avenues, approximately 120 m north west of the proposed lift on Culworth Avenue. The visual impact assessment of this viewpoint is in Table 6.2.

Table 6.2 Viewpoint 1 - Visual Impact Assessment

Viewpoint 1: Culworth Avenue and Lorne Avenue
<p>Receivers</p> <p>Receivers at this location include passers-by (pedestrians, cyclists, motorists) on Culworth Avenue. While a residential property is positioned on the corner of Culworth Avenue and Lorne Avenue, this view is unlikely to be seen by residents in housing at this location due to dense screening vegetation surrounding the residential property, the orientation of the house and the slope of the land away from the viewpoint (refer Figure 6.8).</p>
<p>Existing view</p> <p>Refer to Figure 6.6 and Figure 6.7 for the existing view north from this viewpoint. The existing view comprises the following:</p> <ul style="list-style-type: none"> • the foreground of the view comprises the road pavement, pedestrian traffic island and verges of Culworth Avenue (travelling in a north-south direction) and Lorne Avenue travelling west from the viewpoint • the western edge of the rail corridor flanks Culworth Avenue, viewed as a dense band of vegetation on the eastern side of the road with occasional breaks in the vegetation where the station and passing trains can be seen • on-street parking is seen on both sides of the road on Culworth Avenue south of the intersection with Lorne Avenue • the commuter car park is seen in the gaps between tall, dense screening vegetation on the south western corner of the intersection, with one residential house visible beyond cars within the car park.
<p>Anticipated change to view</p> <p>The key changes to the view due to the Proposal would comprise:</p> <ul style="list-style-type: none"> • provision of a kiss and ride bay with two spaces (including one accessible space) and two new accessible parking spaces • upgrade of the existing footpath to provide an accessible pathway to the station entrance from the kiss and ride bay and accessible parking spaces • provision of five additional bike hoops • provision of a new pedestrian crossing at the existing pedestrian refuge • upgrade of the existing shelter on Culworth Avenue to provide accessible seating and wheelchair waiting area • the top of the new lift and canopy may be seen in the distance • the removal of some vegetation may be seen in the distance • replacement or new fencing. <p>Changes within the station platform and rail corridor at ground level would not be seen from this location.</p>

Sensitivity

Factors contributing to the sensitivity of receivers from this location would include:

- the nature of the visual receivers who would experience this view of the Proposal, primarily comprising passers-by (pedestrians, cyclists and motorists) who would have a casual interest in the views as they move along the street
- the extent to which the attention or interest of receivers would be focused on the view, in this case receivers travelling on the road would be focussed on their view within the road corridor at street level as they travelled. It is unlikely they would see changes within the rail corridor due to the lower elevation of the tracks and platform and the screening vegetation at the edge of the rail corridor.

The value of the view as seen by receivers is influenced by:

- views to greenery, which are typically valued within city areas; however:
 - the rail corridor is utilitarian, with weedy vegetation on the perimeter and rail infrastructure seen above the vegetation
 - passers-by, particularly pedestrians, would only see views for short periods of time on their journey.

For the reasons outlined above the sensitivity of visual receivers to the proposed change in this view are assessed to be Low.

Magnitude of change

From this viewpoint, contributing factors to the magnitude of change arising from the Proposal include:

- the small scale of the change visible within the view from this location, comprising a minor change to the eastern pavement (and elements within the verge including the bus shelter and sidewalk infrastructure such as bike hoops)
- the changes amount to the replacement of elements within the view with similar elements in terms of size, colour, height, mass, etc.
- the largest element potentially seen within the view (the lifts and canopy at the station entry) would be at least partially screened by vegetation and would be seen from a distance of 120 m
- changes would be seen within a small proportion of the view and for short periods of time while the visual receiver approached and passed the viewpoint
- the changes would be seen at an oblique viewing angle and partially screened by cars and vegetation
- the duration of the change would be long term with no chance of reversibility.

Due to the above, the magnitude of change for this viewpoint has been assessed as Low.

Overall rating

Overall, the change in the view seen by receivers from this viewpoint has been assessed as Low (neutral). The proposed changes are an upgrade to an existing road verge and footpath, with new station infrastructure potentially seen in the background at least partially screened by existing vegetation.

The 'neutral' qualitative rating is due to the visually recessive nature of the change within the greater view and the addition of rail infrastructure within an existing rail corridor. The changes neither add nor subtract from the quality of the existing view from this viewpoint.



Figure 6.6 Panorama showing the view from the viewpoint east to the station (left of frame), south along Culworth Avenue (middle of frame) and west along Lorne Avenue (right of frame) (Source: AECOM)



Figure 6.7 Detail of Figure 6.6 showing the view south along Culworth Avenue towards the station entry (Source: AECOM)



Figure 6.8 View looking north to the viewpoint from which Figure 6.6 and Figure 6.7 were taken, showing a dense band of vegetation screening the view south to the Proposal (Source: AECOM)

6.4.2.2 Viewpoint 2: Culworth Avenue council car park

This viewpoint was selected to assess changes to the view from the pedestrian entry point of the council car park on Culworth Avenue, approximately 25 m north west of the proposed lift at the Culworth Avenue station entrance. The visual impact assessment of this viewpoint is in Figure 6.3.

Table 6.3 Viewpoint 2 - Visual Impact Assessment

Viewpoint 2: Culworth Avenue council car park
<p>Receivers</p> <p>Receivers at this location include commuters using the council car park and passers-by (pedestrians, cyclists, motorists) on Culworth Avenue.</p>
<p>Existing view</p> <p>Refer to Figure 6.9 for the existing view east from this viewpoint. The existing view comprises the following:</p> <ul style="list-style-type: none"> • the foreground of the view comprises the road pavement and eastern verge of Culworth Avenue • the eastern verge of the road includes the footpath with station precinct infrastructure including a bus shelter, bins, bike hoops, public telephone, lighting and signage • a large street tree lies at the station entry and the rail corridor is fringed by a dense band of vegetation with occasional breaks in the vegetation where the station roofing can be seen • The entry to the Killara Station is seen in the middleground of the view, comprising a flight of steps up to the footbridge with a small retail kiosk positioned above the platform • on-street parking is seen on both sides of the road on Culworth Avenue to the north and south of this viewpoint.
<p>Anticipated change to view</p> <p>The key changes to the view due to the Proposal would comprise:</p> <ul style="list-style-type: none"> • installation of a new lift to provide access from the Culworth Avenue station entrance to the existing footbridge • installation of a new lift to provide access from the existing footbridge to the station platforms (positioned where the existing retail kiosk stands) • installation of weather protection canopies at the lift landings • removal of the retail kiosk on the existing footbridge to facilitate installation of the new lift • widening of the existing footbridge to accommodate the new lift landing areas • removal of vegetation (particularly one large eucalypt) to the south of the entry steps to the station within the rail corridor to allow for the construction of the new lift • upgrade of items on Culworth Avenue including: <ul style="list-style-type: none"> ○ provision of a kiss and ride bay with two spaces (including one accessible space) and two accessible parking spaces ○ upgrade of the existing footpath to provide an accessible pathway to the station entrance from the kiss and ride bay and accessible parking spaces ○ provision of five additional bike hoops ○ provision of a new pedestrian crossing at the existing pedestrian refuge ○ upgrade of the existing shelter to provide accessible seating and wheelchair waiting area ○ replacement or new fencing

- new pavement around the new lift.

Changes within the station platform and rail corridor at ground level would not be seen from this location.

Sensitivity

Factors contributing to the sensitivity of receivers from this location would include:

- the nature of the visual receivers who would experience this view of the Proposal, primarily comprising users of the council car park and passers-by (pedestrians, cyclists and motorists) who would have a casual interest in the views as they leave the car park or travel along the street
- the extent to which the attention or interest of receivers would be focused on the view, in this case receivers leaving the car park or travelling along the road would be focussed on their view within the road corridor at street level as they travelled past.

The value of the view as seen by receivers is influenced by:

- views to greenery, which are typically valued within city areas; however:
 - the rail corridor is utilitarian, with weedy vegetation on the perimeter and rail infrastructure seen above the vegetation
 - passers-by would only see views for short periods of time on their journey.

For the reasons outlined above the sensitivity of visual receivers to the proposed change in this view are assessed to be Low.

Magnitude of change

From this viewpoint, contributing factors to the magnitude of change arising from the Proposal include:

- the size and scale of the proposed lifts (which comprise new elements within the view) are larger than existing pieces of station infrastructure seen within the view. These additional items would increase the visual presence of the station within the streetscape (i.e. outside the rail corridor)
- the change to the footpath, parking, bus shelter and smaller pieces of station infrastructure (e.g. bins and bike hoops) would result in the replacement of existing elements within the view and would not result in the addition or removal of elements within the view
- the removal of a eucalypt from south of the existing entry stairs to the station would result in the loss of an element within the view
- the changes would be seen from close proximity and in a reasonable amount of detail, however, the remaining vegetation on either side of the rail corridor would assist in reducing the visual prominence of the proposed lifts into the landscape, potentially reducing the bulk of these items by providing a dark backdrop that they would be seen against
- the lifts and changes to the footbridge would be viewed at an oblique angle so only two of the three lifts would be clearly seen. Changes east of the middle lift would be screened by vegetation
- the changes would be seen over a large proportion of the overall view, however, most of these changes would be visually recessive. The most visually prominent element would be the lifts and canopy and these would be seen within a small proportion of the overall view
- the duration of the change would be long term with no chance of reversibility.

Due to the above, the magnitude of change for this viewpoint has been assessed as Moderate.

Overall rating

Overall, the change in the view seen by receivers from this viewpoint has been assessed as Moderate to Low (neutral). The proposed changes comprise an upgrade of the streetscape within an existing rail precinct and the modernisation of rail infrastructure within the rail corridor.

The 'neutral' qualitative rating is due to the visually recessive nature of a majority of the changes within the greater view and the addition of rail infrastructure within or adjacent to an existing rail corridor. The roofline of the largest elements within the view (the lifts and canopy) would be seen against the sky due to the angle of viewing, but would be partially screened by existing vegetation, and the design and materiality of the proposed elements would fit within the greater suite of architectural elements within the wider rail corridor. With the exception of the removal of one large tree, the changes neither add nor subtract from the quality of the existing view from this viewpoint.



Figure 6.9 Existing view from Viewpoint 2 looking east towards the entry to Killara Station from Culworth Avenue

6.4.2.3 Viewpoint 3: 18 Culworth Avenue

This viewpoint was selected to assess changes to the view from the driveway of the apartments at 18 Culworth Avenue (refer Figure 6.10), approximately 35 m north-west of the proposed lift at the Culworth Avenue station entrance. The visual impact assessment of this viewpoint is in Table 6.4.

Table 6.4 Viewpoint 3 - Visual Impact Assessment

Viewpoint 3: 18 Culworth Avenue
<p>Receivers</p> <p>Receivers at this location include:</p> <ul style="list-style-type: none"> residents in the residential apartment block at this viewpoint (refer Figure 6.10) commuters and passers-by (pedestrians, cyclists, motorists) on Culworth Avenue.
<p>Existing view</p> <p>Refer Figure 6.11 for the existing view east from this viewpoint. The existing view comprises the following:</p> <ul style="list-style-type: none"> the foreground of the view comprises the road pavement and both verges of Culworth Avenue, including the concrete footpath with turf, signage and electricity poles and wires, parked cars and occasional street trees the station entrance and station precinct infrastructure (including a bus shelter, bins, bike hoops, public telephone, lighting and signage) are seen in the middleground on the eastern side of the road. A large street tree is located at the station entry and the rail corridor is fringed by a dense band of vegetation with occasional breaks through which the station can be seen

- a flight of steps up to the footbridge and a small retail kiosk positioned above the platform are seen in gaps in the vegetation.

Anticipated change to view

The key changes to the view due to the Proposal would comprise (refer Figure 6.12):

- installation of a new lift to provide access from the Culworth Avenue station entrance to the existing footbridge
- installation of a new lift to provide access from the existing footbridge to the station platforms (positioned where the existing retail kiosk stands)
- installation of a new lift to provide access from the Werona Avenue station entrance to the existing footbridge
- installation of weather protection canopies at the lift landings
- removal of the retail kiosk on the existing footbridge to facilitate installation of the new lift
- widening of the existing footbridge to accommodate the new lift landing areas
- removal of vegetation (particularly one large eucalypt) to the south of the entry steps to the station within the rail corridor to allow for the construction of the new lift
- upgrade of items on Culworth Avenue including:
 - provision of a kiss and ride bay with two spaces (including one accessible space) and two accessible parking spaces
 - upgrade of the existing footpath to provide an accessible pathway to the station entrance from the kiss and ride bay and accessible parking spaces
 - provision of five additional bike hoops
 - provision of a new pedestrian crossing at the existing pedestrian refuge
 - upgrade of the existing shelter to provide accessible seating and wheelchair waiting area
 - new or replacement fencing
- new pavement around the new lift.

Changes within the station platform and rail corridor at ground level would not be seen from this location.

Sensitivity

Factors contributing to the sensitivity of receivers from this location would include:

- the nature of the visual receivers who would experience this view of the Proposal, comprising:
 - residents, are typically considered to be sensitive visual receivers given their proprietary interest, and how changes (including materiality that could potentially be reflective or visually detract from the view) could be expected to result in changes to the outlook from their homes
 - passers-by (pedestrians, cyclists and motorists) who would have a casual interest in the views as they leave the car park or travel along the street
- the extent to which the attention or interest of receivers would be focused on the view:
 - residents would be moderately focused on the view as they entered and left their premises but more focussed on views seen from living areas within their apartments and particularly from apartments on upper storeys which would have elevated views to the surrounding landscape. Properties closest to the Proposal at this location are set back from the road with landscaped front gardens including tall front hedging which potentially partially obscure views to the Proposal from lower apartment windows (refer Figure 6.10)

- receivers travelling along the road would be focused on their view within the road corridor at street level as they travel along the road.

The value of the view as seen by receivers is influenced by:

- the high value residents generally place on views from their homes
- views to greenery, which are typically valued within city areas, however, the vegetation within the rail corridor is typically invasive, with views to utilitarian rail infrastructure seen above the canopy
- passers-by, particularly pedestrians, would only see views for short periods of time on their journey.

For the reasons outlined above the sensitivity of visual receivers to the proposed change in this view are assessed to be Moderate.

Magnitude of change

From this viewpoint, contributing factors to the magnitude of change arising from the Proposal include:

- the size and scale of the proposed lifts (which comprise new elements within the view) are larger than existing pieces of station infrastructure seen within the view. These additional items would increase the visual presence of the station within the streetscape (i.e. outside the rail corridor)
- the change to the footpath, parking, bus shelter and smaller pieces of station infrastructure (e.g. bins and bike hoops) would result in the replacement of existing elements within the view and would not result in the addition or removal of elements within the view
- the removal of a eucalypt from south of the existing entry steps to the station would result in the loss of an element within the view
- the changes would be seen from close proximity and in a reasonable amount of detail
- the lifts and changes to the footbridge would be viewed at a gently oblique angle so that all three lifts would be clearly seen and two of them would be seen in relief against the sky due to the lower angle of viewing
- the changes would be seen over a large proportion of the overall view, however, changes to the streetscape would be visually recessive
- the most visually prominent elements seen from a distance of approximately 35m would only take up a small proportion of the view and comprise the modernisation of rail infrastructure within an existing rail corridor
- the removal of the eucalypt and the construction of the lifts and changes to the footbridge would be visually prominent within the view and raise the visual prominence of the station within the overall landscape setting
- the duration of the change would be long term with no chance of reversibility.

Due to the above, the magnitude of change for this viewpoint has been assessed as Moderate.

Overall rating

Overall, the change in the view seen by receivers from this viewpoint has been assessed as Moderate (neutral). The proposed changes are an upgrade to an existing rail precinct with the changes (particularly the proposed lifts within the rail corridor) comprising a modern addition to the station.

The sensitivity of the visual receivers at this location is mitigated by vegetation along the rail corridor edge. For residents, vegetation within front yards would partially or fully obscure much of the proposed works from this viewpoint.

The 'neutral' qualitative rating is due to the visually recessive nature of the change within the greater view and the addition of rail infrastructure within an existing rail corridor. The changes neither add nor subtract from the quality of the existing view from this viewpoint. The replacement or addition of tall vegetation along the western rail corridor edge (including the replacement of the gum tree proposed to be removed) would reduce the visual prominence of the proposed rail infrastructure within the view from this location.



Figure 6.10 Apartment block at 18 Culworth Avenue, with the apartment set back from the road and landscaped gardens including a taller front hedge and other vegetation partially obstructing views from the ground floor apartment windows (Source: AECOM)



Figure 6.11 Existing view from Viewpoint 3 looking north east towards the entry to Killara Station from 18 Culworth Avenue (Source: AECOM)



Figure 6.12 Photomontage showing the proposed changes to the existing view from Viewpoint 3 (Source: AECOM)

6.4.2.4 Viewpoint 4: Werona Avenue and Locksley Street

This viewpoint was selected to assess changes to the view from the intersection of Werona Avenue and Locksley Street, positioned directly adjacent to the entry to Killara Station on Werona Avenue. The visual impact assessment of this viewpoint is in Table 6.5.

Table 6.5 Viewpoint 4 - Visual Impact Assessment

Viewpoint 4: Werona Avenue and Locksley Street
<p>Receivers</p> <p>Receivers at this location include commuters and passers-by (pedestrians, cyclists, motorists) on Werona Avenue.</p>
<p>Existing view</p> <p>Refer to Figure 6.13 for the existing view north from this viewpoint. The existing view comprises the following:</p> <ul style="list-style-type: none"> the foreground of the view comprises the road pavement, signalised intersection and western verge of Werona Avenue (travelling in a north-south direction) the eastern edge of the rail corridor flanks Werona Avenue, viewed in the middleground as a dense band of vegetation on the western side of the road with a steep set of entry steps to the footbridge and station entry

- the western verge of Werona Avenue to the north of the intersection is vegetated with trees, shrubs and groundcovers within flower beds between the footpath and the kerb. The tall trees and shrubs within the landscaped gardens within the station can be seen beyond the footpath, creating a decorative vegetative edge to the station precinct
- on-street parking is seen on both sides of the road on Werona Avenue north of the intersection with Locksley Street
- tall, somewhat weedy vegetation screens the rail corridor from view to the south of the entry steps to the footbridge.

Anticipated change to view

The key changes to the view due to the Proposal would comprise (refer Figure 6.14):

- installation of a new lift to provide access from the Werona Avenue station entrance to the existing footbridge
- installation of a new lift to provide access from the existing footbridge to the station platforms
- installation of weather protection canopies at the lift landings
- upgrades to the interchange facilities on Werona Avenue including:
 - upgrade of the footpath on Werona Avenue and provision of a ramp to the bus stop including adjustments to existing boundary fencing and new retaining walls
 - provision of five additional bike hoops at the station entrance
 - new pavement around the new lift
 - new or replacement fencing and landscaping.

Changes within the station platform and rail corridor at ground level would not be seen from this location.

Sensitivity

Factors contributing to the sensitivity of receivers from this location would include:

- the nature of the visual receivers who would experience this view of the Proposal, primarily comprising passers-by (pedestrians, cyclists and motorists) who would have a casual interest in the views as they move along the street
- the extent to which the attention or interest of receivers would be focused on the view, in this case receivers travelling on the road would be focussed on their view within the road corridor at street level
- the value of the view as seen by receivers is influenced by:
 - views to greenery, which are typically valued within city areas. In particular the gardens seen on the western side of the street which contributes to the heritage listing of Killara Station, and provides a high quality garden edge to the station precinct when viewed from this location
 - this viewpoint lies adjacent to two other local heritage items: a residence at 25 Werona Avenue and former post office on the south eastern corner of the intersection, next to the viewpoint
 - passers-by, particularly pedestrians, would only see views for short periods of time on their journey.

For the reasons outlined above the sensitivity of visual receivers to the proposed change in this view are assessed to be Moderate.

Magnitude of change

From this viewpoint, contributing factors to the magnitude of change arising from the Proposal include:

- the size and scale of the proposed lifts (which comprise new elements within the view) are larger than existing pieces of station infrastructure seen within the view. These additional items would increase the visual presence of the station within the streetscape (i.e. outside the rail corridor)
- vegetation would be removed from south of the existing entry steps to the footbridge, resulting in the removal of an element from within the view
- the change to the footpath, ramp, and smaller pieces of station infrastructure (e.g. bins and bike hoops) would result in the replacement of existing elements within the view and would not result in the addition or removal of elements within the view
- the changes would be seen from close proximity and in a high amount of detail
- the lifts and changes to the footbridge would be viewed along the shortest edge of the changes (an almost 'gun-barrel' view along the existing footbridge) and therefore only the eastern-most edge of the lift on Werona Avenue would be clearly seen. This lift would be seen in relief against the sky due to the low angle of viewing
- the changes would be seen over a large proportion of the overall view, however, changes to the streetscape would be visually recessive, while the most visually prominent element (the lift) would be seen from a distance of approximately 15m and would only take up a small proportion of the view
- this change would comprise the modernisation of rail infrastructure within an existing rail corridor
- the duration of the change would be long term with no chance of reversibility.

Due to the above, the magnitude of change for this viewpoint has been assessed as Moderate.

Overall rating

Overall, the change in the view seen by receivers from this viewpoint has been assessed as Moderate (adverse). The proposed changes are an upgrade to an existing rail precinct with the changes (particularly the proposed lifts within the rail corridor) comprising a modern addition to the station precinct. These changes are considered appropriate given the proportional scale of the proposed lift in relation to the surrounding vegetation, much of which would be retained and protected. The sensitivity of the visual receivers at this location is mitigated by this surrounding vegetation along the rail corridor edge.

The 'adverse' qualitative rating is due to the high quality of the view due to the heritage listed station, the gardens of which make up an important element within the listing. The quiet, suburban station setting would change with the addition of the proposed lift structures, which would raise the visual prominence within the suburban setting. However, the design and materiality of the proposed elements would fit within the greater suite of architectural elements within the wider rail corridor.



Figure 6.13 Existing view from Viewpoint 4 looking west from the southern corner of the intersection of Werona Avenue and Locksley Street (Source: AECOM)



Figure 6.14 Photomontage showing the proposed changes to the existing view from Viewpoint 4 (Source: AECOM)

6.4.2.5 Viewpoint 5: 25 Werona Avenue

This viewpoint was selected to assess changes to the view from the footpath outside of 25 Werona Avenue, looking south west towards the station entrance. The visual impact assessment of this viewpoint is in Table 6.6.

Table 6.6 Viewpoint 5 - Visual Impact Assessment

Viewpoint 5: 25 Werona Avenue
<p>Receivers</p> <p>Receivers at this location include:</p> <ul style="list-style-type: none"> • residents at 25 Werona Avenue (refer Figure 6.15) • commuters and passers-by (pedestrians, cyclists, motorists) on Werona Avenue.
<p>Existing view</p> <p>Refer Figure 6.16 for the existing view north from this viewpoint. The existing view comprises the following:</p> <ul style="list-style-type: none"> • the foreground of the view comprises the sandstone boundary fencing of 25 Werona Avenue, eastern footpath of Werona Avenue and road pavement with parked cars • a well maintained shrubbery on the western verge of Werona Avenue and ornamental trees and shrubs within the gardens on the eastern edge of Killara Station are seen in the midground of the view with rail corridor fencing, Killara station building and passing trains seen in gaps in this vegetation. The platform itself is not seen due to the angle of viewing

- on-street parking is seen on both sides of the road on Werona Avenue, north of the intersection with Locksley Street
- the station entry (particularly the stairs to the existing footbridge and the footbridge itself) are screened from view by tall, dense vegetation.

Anticipated change to view

The key changes to the view due to the Proposal would comprise:

- upgrades to the interchange facilities on Werona Avenue including:
 - upgrade of a section of the existing footpath on Werona Avenue and provision of a ramp to the bus stop including adjustments to existing boundary fencing and new retaining walls
 - removal of vegetation to facilitate this upgrade
 - provision of five additional bike hoops at the station entrance
 - new pavement around the new lift.

Changes to the footbridge and proposed lifts between the footbridge and Werona Avenue may be visible from this location but would be either mostly or partially screened from view by existing vegetation.

Sensitivity

Factors contributing to the sensitivity of receivers from this location would include:

- the nature of the visual receivers who would experience this view of the Proposal, including:
 - residents, who are typically considered to be sensitive visual receivers given their proprietary interest in views seen from their homes
 - passers-by (pedestrians, cyclists and motorists) who would have a casual interest in the views as they move along the street
- the extent to which the attention or interest of receivers would be focused on the view, including:
 - residents, who would be moderately focused on the view as they entered and left their premises but more focussed on views seen from living areas within their homes. The residence at 25 Werona Avenue is positioned at a lower level to Werona Avenue, with only upper windows potentially receiving views to the Proposal through a gap in the hedge surrounding the property
 - receivers travelling on the road would be focussed on their view within the road corridor at street level
- The value of the view as seen by receivers is influenced by:
 - views to greenery, which are typically valued within city areas. In particular the gardens seen on the western side of the street which contributes to the heritage listing of Killara Station, and provides a high quality garden edge to the station precinct when viewed from this location
 - this viewpoint assesses the view from 25 Werona Avenue which is a locally listed heritage item
 - passers-by, particularly pedestrians, would only see views for short periods of time on their journey.

For the reasons outlined above the sensitivity of visual receivers to the proposed change in this view are assessed to be Moderate.

Magnitude of change

From this viewpoint, contributing factors to the magnitude of change arising from the Proposal include:

- the size and scale of the change seen from this viewpoint is likely to be minor, considering the most visible elements would be the changes to the bus stop, footpath and ramp on Werona Avenue, which would comprise a replacement of similar elements
- the removal of one tree within the verge would result in the loss of an element within the view
- the largest proposed elements would be predominantly screened from view and seen from an oblique angle along the street
- the changes would occur to a moderate proportion of the overall view, but comprise small changes within it
- the visually important elements within the view (namely the well-maintained shrubbery opposite the viewpoint on Werona Avenue and the gardens on the eastern edge of the station) would be preserved and protected
- the duration of the changes would be long term with no chance of reversibility, however, any landscaping that was reinstated on the western verge of Werona Avenue near the upgraded footpath would reduce the visual prominence of the changes to this area over time.

Due to the above, the magnitude of change for this viewpoint has been assessed as Low.

Overall rating

Overall, the change in the view seen by receivers from this viewpoint has been assessed as Moderate to Low (neutral). The proposed changes visually comprise the upgrade of a footpath and new ramp within an existing station precinct.

The sensitivity of the visual receivers at this location is mitigated by vegetation along the rail corridor edge, and (for residents), vegetation within front yards that would partially or fully screen much of the proposed works from this viewpoint.

The 'neutral' qualitative rating is due to the visually recessive nature of the change within the greater view and the addition of rail infrastructure within an existing rail corridor. The changes neither add nor subtract from the quality of the existing view from this viewpoint.



Figure 6.15 The view east from the Killara Station platform to 25 Werona Avenue (Source: AECOM)



Figure 6.16 The existing view from Viewpoint 5 looking south west towards the station (Source: AECOM)

7.0 Summary

7.1 Summary of landscape character impact

Six (6) LCZs have been identified within the study area, however, changes due to the Proposal:

- only occur within one LCZ (LCZ 1)
- lie within close proximity of three additional LCZs (LCZ 3, LCZ 4 and LCZ 6).

A summary of the assessment of the Proposal on landscape character is shown in Table 7.1.

Table 7.1 Summary of landscape character impact assessment ratings

LCZ	Sensitivity	Magnitude	Overall rating
LCZ 1: Rail Corridor	Moderate	Moderate	Moderate
LCZ 2: Major Road Corridor	No Change		
LCZ 3: High Density Residential	No Change		
LCZ 4: Low Density Residential	Moderate	Low	Moderate to Low
LCZ 5: Public Open Space	No Change		
LCZ 6: Commercial	No Change		

The Proposal would result in no changes to LCZ 2, LCZ 3, LCZ 5 and LCZ 6 due to their distance from the Proposal and/or screening by built form, topography and vegetation. The Proposal would result in a Moderate impact to landscape character within LCZ 1: Rail Corridor, and a Moderate to Low impact to landscape character within LCZ 4: Low Density Residential.

While the upgrade of existing rail infrastructure would not result in a change to the character of the greater LCZ, the addition of three larger structures (the lifts) would result in the modernisation of rail infrastructure within the rail corridor resulting in a change in the existing suburban character of the station precinct, elements of which are heritage listed.

Changes within the landscape surrounding the station (predominantly LCZ 4: Low Density Residential) are minimal, however, the sensitivity of the LCZ lies predominantly in the heritage setting of the residential suburb. Changes to the road verge and station entrance within this context are therefore important, if not substantial.

In relation to the potential changes to landscape character is recommended that:

- landscaping (including potential planting of street trees or shrubs, if possible) is considered in the detailed design phase of the Proposal
- design elements reference the heritage character of the LCZ, however, maintain the visual quality of a 'new' piece of infrastructure rather than replicating heritage items
- the protection of the gardens on the eastern side of the station between the existing pedestrian footbridge and the electrical substation is recommended to preserve the character of the suburban station within its heritage setting.

7.2 Summary of visual impact

7.2.1 Construction

During construction, visible construction elements would be expected to typically include a range of site sheds, hoardings, plant – including for excavation of lift wells, a crane to place the lifts, and heavy vehicles bringing in and unloading materials.

A temporary construction compound within the council car park off Culworth Avenue would be required to accommodate a site office, amenities, laydown and storage area for materials. Another temporary construction compound would be required on the corner of Culworth Avenue and Powell Street for laydown and storage area for materials. Other areas within the rail corridor may also be used for short term temporary laydown during rail shutdown periods. These areas would not be used outside of rail shutdown periods

The most visually prominent construction activity would be associated with the construction of the three lifts, widening of the footbridge, upgrade work to the footpath and kerbs / parking areas on Culworth Avenue and Werona Avenue near the station entrance and the construction compounds. Construction on the platform (including changes to the station building, replacement or installation of tactiles and other more minor changes) would be difficult to see outside of the rail corridor and would therefore impact users of the rail facilities rather than the general (non-rail user) public.

The most sensitive visual receivers viewing the construction activity are residential receivers viewing the changes from their homes. These receivers would see the changes from close proximity and potentially from within living areas of their homes, particularly residents in the apartment blocks to the south and west of the proposed construction compound on Culworth Avenue and on the corner of Powell Street. However, these few receivers would see the changes through partial screening of existing vegetation surrounding the car park and along Culworth Avenue. Residential receivers on Werona Avenue would be unlikely to see the construction activity from within the living areas of their homes due to screening vegetation and fencing surrounding their properties.

Other receptor groups who would be viewing the construction activity include rail commuters, passers-by on Culworth Avenue and Werona Avenue and workers or visitors to the nearby business enterprises and community facilities on Marian Street.

Overall, views to the construction compounds and other construction activity due to the Proposal are considered to be relatively minor. They would be consistent with similar temporary construction work sites and activities, and transitory over a period of about 18 months until completion of the Proposal. A majority of the receivers would have a low sensitivity to the changes (being passers-by and rail commuters) and there would be a low number of receivers with a higher sensitivity to the changes.

7.2.2 Operation

The most visually prominent changes resulting from the Proposal include construction of three lifts, changes to the footbridge, removal of vegetation and changes to the footpaths and station infrastructure. Changes to the platform and immediate surrounds within the rail corridor would be difficult to see from the surrounding landscape due to changes in landform, surrounding built form and planting.

At Killara Station the rail corridor is positioned on a gentle slope which falls from a ridgeline running roughly parallel to the Pacific Highway to the east. This landform results in the tallest proposed elements (the three lifts and landings connecting to the existing footbridge) potentially being seen from the immediate surrounds of the station, but also from further distances to the east as the land falls away from the station.

The surrounding landscape is mostly residential development, including areas of medium and high density apartments and older low density residential suburbs. The area has a high proportion of tall trees, both exotic (street trees and trees in private properties associated with older housing within the surrounding HCAs, particularly to the east) and native. Native trees include individual and patches of remnant vegetation.

The station precinct, while elevated above the sloping landscape to the east, is also therefore visually insulated, with views to and from limited by these factors. Views to the station are predominantly seen by visual receivers directly surrounding the station, including receivers passing the station in vehicles.

Five (5) viewpoints have been chosen to represent the change in views from publicly accessible areas due to the Proposal. The assessment of change in views from these locations are summarised in Table 7.2.

Table 7.2 Summary of visual impact assessment ratings

Viewpoint	Sensitivity	Magnitude	Overall rating	Qualitative assessment
Viewpoint 1: Culworth Avenue and Lorne Avenue	Low	Low	Low	Neutral
Viewpoint 2: Culworth Avenue council car park	Low	Moderate	Moderate to Low	Neutral
Viewpoint 3: 18 Culworth Avenue	Moderate	Moderate	Moderate	Neutral
Viewpoint 4: Werona Avenue and Locksley Street	Moderate	Moderate	Moderate	Adverse
Viewpoint 5: 25 Werona Avenue	Moderate	Low	Moderate to Low	Neutral

Overall, the visual impact to receivers has been assessed between Low (neutral) to Moderate (adverse), with no viewpoints returning a significant change in views (i.e. overall ratings of High to Moderate or High). The proposed changes include an upgrade to an existing rail precinct with the changes (particularly the proposed lifts within the rail corridor) comprising modern additions to the rail concourse. These changes are considered appropriate given the benefit of the Proposal in comparison to the low number of sensitive visual receivers that would see the changes.

The sensitivity of the visual receivers surrounding the station (particularly from the more sensitive residential receivers to the north of the rail corridor) is generally low given the presence of screening vegetation along the rail corridor edge.

The assessment resulted in a 'neutral' qualitative rating from four out of the five viewpoints. This is due to:

- the visually recessive nature of a majority of the changes within the greater view from most viewpoints
- the addition or upgrade of rail infrastructure within an existing rail corridor.

One 'adverse' qualitative rating was due to the change to the suburban station setting with the addition of the proposed lift structures, which would raise the visual prominence of the station within the suburban setting. Overall, the design and materiality of the proposed elements would fit within the greater suite of architectural elements within the wider rail corridor.

8.0 Mitigation of impact and conclusion

8.1 Mitigation measures

This section outlines the mitigation measures that would be implemented to minimise the level of visual impact during the design development, construction and operation phases of the Proposal.

8.1.1 Design development

The following general mitigation measures are recommended to minimise visual impacts during the design development process:

- landscaping within the road verge and along the rail corridor edges (including potential planting of street trees or shrubs, if possible) would be considered along Werona Avenue
- design elements would reference the heritage character of the station and surrounding landscape, however, maintain the visual quality of a 'new' piece of infrastructure rather than replicating heritage items
- the heritage gardens on the eastern side of the station should be protected to preserve the character of the suburban station within its heritage setting
- disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal
- measures to limit or deter graffiti on proposed structures would be considered.

8.1.2 Construction

The following mitigation measures are recommended to minimise visual impacts as a result of construction:

- establish TPZs around trees to be retained. Tree protection would be undertaken in keeping with AS 4970-2009 Protection of Trees on Development Sites and would include exclusion fencing of TPZs
- provide well-presented and maintained construction hoarding and site fencing with shade cloth (or similar material) (where necessary) to minimise visual impacts during construction. Hoardings and site fencing would be removed following construction completion
- provide cut-off or directed lighting within and outside of the construction site, with lighting location and direction considered to ensure glare and light spill is minimised
- keep construction areas clean and tidy and place refuse in appropriate receptacles.

8.1.3 Operation

The following mitigation measures are recommended to minimise visual impacts during operation:

- ongoing maintenance and repair of constructed elements
- removal of graffiti in accordance with Transport for NSW / Sydney Trains maintenance requirements.

8.2 Conclusion

The effects of the Proposal on landscape character would range between No change and Moderate, and on views and visual amenity would range between Low (neutral) and Moderate (adverse). As such, this report finds that would be no significant effect on either landscape character or on views and visual amenity as a result of the Proposal (i.e. there were no ratings of High (adverse), or Moderate–High (adverse)).