

measures. Land use planning measures could include options such as ensuring that commercial and industrial occupancies face onto the main operational zone of each precinct. Operational measures could include careful selection of bus routes and the implementation of 'quiet' buses into the area. It is also recommended that further noise assessment of the interchanges is undertaken once the design development and GCC planning processes have further progressed.

Ground-borne noise

A ground-borne noise assessment would be undertaken during the detailed design stage of the Project, once the location and extent of airborne mitigation measures have been determined.

Future environment

As discussed in Section 8.4.4, the impacts of the Project on the future environment are difficult to ascertain as planning for the NWGC is still in preliminary stages. Noise dampers and/or noise barriers have been considered as part of this Project only where impacts to existing sensitive receivers have been identified. Future residential development should be guided by the Department of Planning's (2008) *Development near rail corridors and busy roads – interim guideline*, and Clause 87(3) of the *State Environmental Planning Policy (Infrastructure) 2007*, which states that for development for the purposes of a building for residential use, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following L_{Aeq} levels are not exceeded:

- (a) in any bedroom in the building — 35 dB(A) at any time between 10 pm and 7 am
- (b) anywhere else in the building (other than a garage, kitchen, bathroom or hallway) — 40 dB(A) at any time.

Potential noise and vibration impacts on the future environment could be reduced by appropriate land use zoning of surrounding areas. For example, commercial development, such as that of a town centre, would have a lower sensitivity to rail noise than residential development.

8.5 Non-Indigenous heritage

This section summarises the non-Indigenous heritage impacts associated with the Project based on the key findings of Technical Paper 3 — Non-Indigenous Heritage, contained in Volume 2. Measures proposed to manage identified non-Indigenous heritage impacts are also outlined. Existing non-Indigenous heritage values in the vicinity of the Project are described in Section 3.5.

8.5.1 Assessment approach

The key objective of the non-Indigenous heritage assessment was to identify historic/European (non-Indigenous) archaeological and cultural heritage values in the vicinity of the Project that are likely to be impacted during the construction and operation of the Project. The likely impacts associated with the proposed construction works and final project form were assessed for identified items of heritage significance (refer Section 3.5.2), based on the principles and guidelines of the *Burra Charter* (Australia ICOMOS 1999), the *NSW*

Heritage Manual (NSW Heritage Office 1996) and the *Assessing Heritage Significance Guidelines* (NSW Heritage Office 2001). The non-Indigenous heritage assessment included:

- a review of background information (refer Section 3.5 and Technical Paper 3)
- a field survey (refer Section 3.5 and Technical Paper 3)
- an assessment of the physical condition, curtilage and context of the heritage item (refer Section 3.5 and Technical Paper 3)
- an assessment of significance of heritage items (refer Section 3.5.2 and Technical Paper 3)
- the development of mitigation measures (refer Section 8.3.5 and Technical Paper 3).

8.5.2 Non-Indigenous heritage impacts

Overview

An evaluation of the status of items of non-Indigenous heritage significance impacted by the Project, their significance and any listing on non-Indigenous heritage registers is outlined in Section 3.5. A detailed assessment of the heritage impacts of the Quakers Hill to Vineyard Duplication Project is provided in Section 6.3 of Technical Paper 3. An overview of the assessment is provided in Table 8-35 and discussed below.

Table 8-35 Overview of non-Indigenous heritage impacts

Item	Direct impacts	Indirect impacts
Quakers Hill Station footbridge	None	None
Quakers Hill to Vineyard Rail Corridor	Duplication of existing track within corridor, construction of new track sections outside existing corridor and modification of current cuttings and culverts. Removal of existing stations at Schofields and Vineyard.	None
Riverstone Railway Station and Yard Group	Direct impact to Platform 1 comprising the addition of tactiles to aid vision impaired rail patrons, general resurfacing and re profiling to a grade not exceeding 1:20.	Reduced aesthetic qualities of the station precinct due to the addition of new pedestrian walkway forming a visually strong element within the precinct.

The construction of the Project would have a direct impact on the Quakers Hill to Vineyard rail corridor and the Riverstone Station precinct. The final form of the Riverstone Station upgrade would have an indirect effect on the aesthetic qualities and integrity of the Riverstone Railway Station and Yard Group.

Direct impacts

The construction of the Project would have a direct impact on the Quakers Hill to Vineyard rail corridor, and the existing Platform 1 at Riverstone Station. The impact to these heritage items is discussed in the following sections.

Quakers Hill to Vineyard rail corridor

Whilst not listed on any formal heritage register, the non-Indigenous heritage assessment (Technical Paper 3 in Volume 2) determined that the structural items, such as cuttings, culverts and embankments, associated with the Richmond Line have limited potential to further our understanding of the changes in the building practices and materials used in the construction and upgrade of nineteenth century railway lines (refer Section 3.5.2).

The Project would involve the duplication of the current single track rail line from the northern end of Quakers Hill Station to Vineyard Station (refer Figure 6-1), and the relocation of the existing stations at Schofields and Vineyard. Construction works would require substantial earthworks that would remove cuttings and modify and/or extend culverts associated with the existing rail line.

While the proposed works would have a direct impact on the rail corridor, short sections of dual line track already exist around Riverstone Station to facilitate rail operations. It is, therefore, expected that the duplication of the remaining single line sections of track as part of the Project would not constitute a substantial alteration to the context of the existing rail line. The required demolition work and subsequent upgrading of the rail corridor complements the Quakers Hill to Vineyard rail line as a functioning piece of railway infrastructure.

The removal of the existing stations at Schofields and Vineyard would not have a significant impact on the overall heritage significance of the Quakers Hill to Vineyard rail corridor as both of these station complexes (inclusive of the ancillary building at Schofields Station that fronts Railway Parade) are of relatively recent construction and possess no significant heritage components. In addition, the construction of the new station complexes would not require a significant deviation from the original rail corridor route, and therefore, would also have little impact on the heritage significance of the Quakers Hill to Vineyard section of the original Windsor railway line.

Riverstone Railway Station and Yard Group

The Riverstone Railway Station and Yard Group is of state heritage significance, listed on the State Heritage Register (SHR), RailCorp's S170 Heritage and Conservation Register, Blacktown Local Environmental Plan 1998 (Blacktown LEP) and the National Trust (refer Section 3.5.2). The Riverstone Station and Yard Group is an excellent composite group of station and service buildings with several unusual buildings located in the metropolitan area and retaining its original track arrangements (refer Section 3.5.2).

The proposed works at Riverstone Station would include:

- upgrading the whole of the Riverstone Station precinct to be compliant with the DDA and easy access standards (This would include regrading the surface of platforms 1 and 2 to provide level access.)
- widening Platform 2 to 3.5 metres
- the construction of a new footbridge accessible by stairs and lifts
- communications, security and associated infrastructure works.

The existing up platform (Platform 1) would be subject to the addition of tactiles to aid vision impaired rail patrons, general resurfacing and re-profiling to a grade not exceeding 1:20. These works would all have a physical impact on the Platform 1 fabric, which is an original component of the complex. The impact of these works would involve minor modification of the Platform 1 structure and would not significantly alter its component fabric or function. Notwithstanding this, the Platform 1 modifications should be viewed as sympathetic ongoing maintenance as they are required to keep the Station complex functioning in its original role and context.

Widening of the existing Down platform (Platform 2) and upgrading it to level access would have no impact on Riverstone Station's significant heritage fabric as this item (Platform 2) is a modern addition to the complex. The proposed works to the platforms associated with the widening of Platform 2, providing level access, installation of tactiles and resurfacing works are all subtle changes that are required to keep the Station complex functioning in its original role and context. It is not possible to maintain any functional item in perpetuity without making changes to that item and these changes are in keeping with the station's role as a functioning component of the public transport system.

Direct physical effects on heritage listed buildings in the Riverstone Railway Station and Yard Group have been avoided through the design of the proposed pedestrian bridge. As shown in Figure 3-18, the pedestrian footbridge was designed to be physically separated from the heritage items in the Riverstone Station precinct. The proposed footbridge would be located at the southern end of the station, to the rear of the Stationmaster's Cottage, where more recent development has created a separation of the cottage from the main group of heritage-listed buildings. As such, this location would not compromise the integrity of existing heritage listed building structures. The full design statement for the proposed pedestrian footbridge is provided in Appendix C of Technical Paper 3 (refer Volume 2).

Quakers Hill Station footbridge

The Quakers Hill Station footbridge is of local significance, and is listed on the State Heritage Inventory and RailCorp's S170 Heritage and Conservation Register (refer Section 3.5.1). The footbridge is a good example of the technological and stylistic change that occurred in the early 1970s (refer Section 3.5.2).

The construction of the Project would not affect the Quakers Hill Station footbridge. Construction works are proposed to commence north of the Quakers Hill Station, and would not physically affect the heritage significance of the structure. In addition, the current dual track arrangement in the vicinity of the Quakers Hill Station footbridge would be maintained, ensuring that no visual change would arise, and therefore, would not affect the heritage significance of the structure.

Indirect impacts

Riverstone Railway Station and Yard Group

The upgrading of the station would comply with DDA and easy access standards, and the widening of Platform 2 would not directly impact the heritage buildings at Riverstone Station (refer Figure 3-18).

The footbridge would be the largest new structure added to the site, forming a new, visually strong element within the existing precinct. While the addition of a new element to the precinct would be different in scale and form to the existing heritage buildings, best practice heritage management and design philosophies do not advocate the mimicking of past architectural styles when adding new components to existing precincts. The indirect impacts of the footbridge on the aesthetic qualities and integrity of the Riverstone Railway Station and Yard Group would be managed through the application of sympathetic design principles. Accordingly, the proposed upgrade works at Riverstone Station are intended to result in contemporary aesthetics successfully placed beside the existing heritage items, resulting in distinctly individual elements associated with the relevant eras of the buildings. The footbridge would be set back behind the existing building line in an area where development works during the 1970s and 1980s have separated the Stationmaster's Cottage from the main group of heritage buildings (refer Figure 3-18). The apparent bulk and overshadowing associated with the footbridge would be reduced through the addition of a forecourt to Riverstone Parade.

The timber station sign would be relocated close to its current location on Platform 1. The relocation would have no overall negative effect on the heritage value of the station precinct, or on the integrity of the heritage value of the station group.

The proposed upgrade works at Riverstone Station are required to keep the heritage item as a functioning component of the rail network. By their nature the proposed works would add a new element to the precinct that, in order to comply with contemporary safety requirements, would be different in form and scale to the heritage buildings.

Through adoption of the abovementioned design measures, the Project works at Riverstone Station would not substantially compromise the integrity of the existing heritage listed buildings in the station precinct. In addition, as all new additions to the station complex would be freestanding, it is possible that they could be removed in the future, if required, without any discernible effect on the original station grouping.

The proposed upgrade works at Riverstone Station would retain this heritage item as a functioning component of the rail network. The outcome would be a functioning station precinct with a mix of state-of-the-art nineteenth and twenty-first century railway infrastructure working in concert to provide safe and efficient public transport for one of greater Sydney's major growth centres.

8.5.3 Management measures

The upgrade of Riverstone Station would not substantially affect the existing heritage values of the Riverstone Station precinct. Therefore, it is not considered necessary to prepare a Conservation Management Plan for the Riverstone Station complex. Notwithstanding this, the following heritage management measures are proposed.

Construction

Archival recording

It is recommended that prior to the commencement of construction, archival recording (including structural and landscape components) is undertaken of the Riverstone Station precinct, including the rail line between Quakers Hill and Vineyard. Photography is to be undertaken in compliance with the NSW Heritage Office's *Photographic Recording of*

Heritage Items using Film or Digital Capture 2006. Upon completion of the archival record, one copy is to be lodged with the NSW State Library, the Heritage Office of the Department of Planning, and TIDC respectively.

Stop work provision — historic heritage

In accordance with provisions in the *Heritage Act 1977*, in the event that unanticipated historic structural fabric or cultural deposits are encountered during construction, work must cease immediately to allow an archaeologist to make an assessment of the finds. The archaeologist would consult with the Department of Planning Heritage Branch when any historic cultural material is identified.

Operation

Interpretive signage

It is recommended that interpretive signage is erected at Riverstone Station, including information on the history of the Station Complex, as well as the significance of the Richmond Line.

8.6 Flora and fauna

This section summarises the potential impacts of the Project on the existing biodiversity in and adjacent to the project area, based on the findings of Technical Paper 5 – Biodiversity Assessment in Volume 2. This section also provides management measures and recommendations to minimise the potential impact of the Project on existing biodiversity (refer Section 8.6.7). Existing flora and fauna identified in and adjacent to the existing rail corridor is described in Section 3.6.

8.6.1 Assessment approach

The key objectives of the biodiversity assessment were to undertake impact assessments for Threatened species, populations and communities that occur, or have potential habitat, within the project area (refer Section 3.6.2).

For species and communities listed under the EPBC Act significance assessments were undertaken in accordance with the administrative guidelines of the Department of the Environment, Water, Heritage and the Arts (DEWHA) (Department of the Environment and Heritage 2006).

The majority of the study area occurs within the NWGC certified area (refer Section 2.3).

Certification aims to achieve landscape-scale conservation, moving away from site-by-site decision-making and providing greater certainty in land-use planning. The main practical effect of certification is that it removes the need to undertake threatened species assessments for developments or activities within the area subject to certification.

Biodiversity certification switches off the need to undertake further significance assessments for threatened species and endangered ecological communities (EECs) in these areas under Section 5A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) (the Seven Part Test). For species, populations and communities listed under the *Threatened Species Conservation Act 1995* (TSC Act) that occur within non-certified areas, or outside the growth