sydney METRO | city & southwest

CHATSWOOD TO SYDENHAM

VICTORIA CROSS STATION AND ARTARMON SUBSTATION MODIFICATION SUBMISSION REPORT

NSW GOVERNMENT Transport for NSW

NSW MAKING IT HAPPEN

EXECUTIVE SUMMARY

Executive summary

Sydney Metro City & Southwest has been developed within the framework of the transport and planning strategies identified in State government policies. This includes the 12 NSW Premier priorities (established to grow the economy, deliver infrastructure, and improve health, education and other services across NSW), Sydney's Rail Future: Modernising Sydney's Trains, Draft Metropolitan Strategy for Sydney 2031 and the NSW Long Term Transport Master Plan. The project responds to these challenges delivering a step-change in the capacity of Sydney's rail network by providing a fully automated rail system across Sydney, supporting high demand with a high capacity, turn-up-and-go service.

Planning approval for Sydney Metro City & Southwest Chatswood to Sydenham was granted by the Minister for Planning under Part 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 9 January 2017.

Transport for NSW is seeking to modify the approved project in relation to proposed changes at Victoria Cross Station and Artarmon substation in accordance with section 115ZI of the EP&A Act. A modification report was lodged with the Department of Planning and Environment and publically exhibited from 7 June 2017 and 5 July 2017.

Purpose of this report

During public exhibition of the modification report, ten submissions were received by the Department of Planning and Environment. The Secretary of Department of Planning and Environment provided copies of the submissions to Transport for NSW.

This report provides:

- Clarifications to the information presented in the modification report
- An overview of consultation that has occurred during and after the public exhibition period
- A summary of the issues raised during the modification report public exhibition period
- Responses to the issues raised in submissions.

Clarifications

The clarifications provided in this report address the following:

- Inconsistencies and missing data in the construction noise assessment results presented in the modification report
- Over station development provision and future use of residual land at the Victoria Cross Station northern entry
- Management of trees on the Miller Street and McLaren Street frontages at the Victoria Cross Station northern entry
- Revised setbacks for the Victoria Cross Station northern entry
- Revised setbacks for the Artarmon substation

Overview of submissions

The Department of Planning and Environment received ten submissions during the modification report exhibition period. Of these submissions, three were from government agencies and two were from local councils. These agencies raised a range of issues relevant to their respective areas of interest and responsibility. Further information on key issues raised by each group is provided in Chapter 4 (Submissions received).

A total of five submissions were received from the community, educational institutions, businesses and other stakeholders. Key issues of most concern to these groups included:

- Management of construction traffic
- Pedestrian connectivity
- Assessment process for construction and operational noise
- Impacts of construction and operational noise
- Construction traffic noise, particularly during the evening and night-time periods
- Over station development and the potential redevelopment of residual land
- Building setbacks
- Impacts on existing building basements
- Impacts on trees
- Access for less mobile people.

Chapter 5 and Chapter 6 of this report present the issues raised in submissions and provide responses to these issues.

Next steps

The Department of Planning and Environment will, on behalf of the NSW Minister for Planning, review the modification report and this submissions report. Once the Department of Planning and Environment has completed its assessment, a draft assessment report will be prepared, which may recommend additional or revised conditions of approval.

The assessment report will then be provided to the NSW Minister for Planning (or delegate) for consideration. The Minister for Planning (or delegate) may then approve the proposed modification, with any revised or additional conditions considered appropriate.

The NSW Minister for Planning's (or delegate's) determination, including any revised conditions of approval and the assessment report, will be published on the Department of Planning and Environment's website immediately after determination, together with a copy of this submissions report.

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INTRODUCTION

CHAPTER ONE

1 Introduction

1.1 Overview

Planning approval for Sydney Metro City & Southwest Chatswood to Sydenham was granted by the Minister for Planning under Part 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 9 January 2017.

Works at Victoria Cross Station as part of the approved project involve:

- Construction of Victoria Cross Station, located beneath Miller Street between McLaren Street and south of Berry Street, including the entrance structure within the north end of the block bordered by Miller Street, Berry Street, and Denison Street
- Construction of a northern station services building, a separate dedicated services facility at 194 and 196A Miller Street to the north of Victoria Cross Station to support station and metro tunnel services. The facility includes an above-ground services building and a services shaft extending downwards from the basement of the building to the Victoria Cross Station cavern.

Works at Artarmon substation as part of the approved project involve the construction of a substation beside the Gore Hill Freeway in Artarmon to provide traction power to the railway. The substation would be housed in an aboveground building with a shaft to reticulate cables to the tunnels below.

Transport for NSW is seeking to modify the approved project in relation to proposed changes at Victoria Cross Station and Artarmon substation in accordance with section 115ZI of the EP&A Act. A modification report was lodged with the Department of Planning and Environment and publically exhibited from 7 June 2017 and 5 July 2017.

1.2 Need for the proposed modifications

1.2.1 Victoria Cross Station modification

The proposed Victoria Cross Station modification responds to Condition A21 of the planning approval, which requires further detailed analysis of alternative locations for the Victoria Cross Station northern services building. It also responds to the opportunity to provide an additional station entrance to improve access in the northern part of the North Sydney CBD, and to support opportunities for future growth.

The proposed modification is consistent with the *Sydney Metro Planning Study* (North Sydney Council, 2016), which supports a second Victoria Cross Station entrance north of Berry Street.

1.2.2 Artarmon substation modification

The proposed Artarmon substation modification responds to Willoughby City Council and community feedback received during the exhibition of the Environmental Impact Statement and is consistent with the commitment given in the submissions report to investigate alternative sites for the Artarmon substation.

1.3 Overview of the proposed modifications

1.3.1 Victoria Cross Station modification

The Victoria Cross Station modification proposes to relocate the northern station services building from 194 and 196A Miller Street, North Sydney, to 50 McLaren Street, North Sydney. The northern station services building would include a three storey services building and a services shaft extending downwards to the depth of Victoria Cross Station cavern. Underground services adits would connect the services building to the northern end of the station mezzanine and platforms.

It is also proposed that a lift-only station entry be incorporated into the northern station services building to service the northern catchment of Victoria Cross Station and to increase the reach of the station catchment to include additional regional attractors. The northern station entry would include pedestrian access from the corner of Miller and McLaren streets to the Victoria Cross Station mezzanine level via vertical transport (lift-only) and an underground pedestrian connection.

The combined services building and northern station entry is referred to in this modification report as the 'northern station entry and services building'.

Figure 1-1 shows the location of the proposed Victoria Cross Station modification site.

1.3.2 Artarmon substation modification

The Artarmon substation modification involves relocating the Artarmon substation from Butchers Lane, north of the Gore Hill Freeway, to 98-104 Reserve Road, within the Artarmon industrial area to the south of the Gore Hill Freeway. The form of the substation would be generally consistent with the approved project, and would include an aboveground building with an associated shaft to reticulate cables to the tunnels below.

Figure 1-2 shows the location of the proposed Artarmon substation modification site.

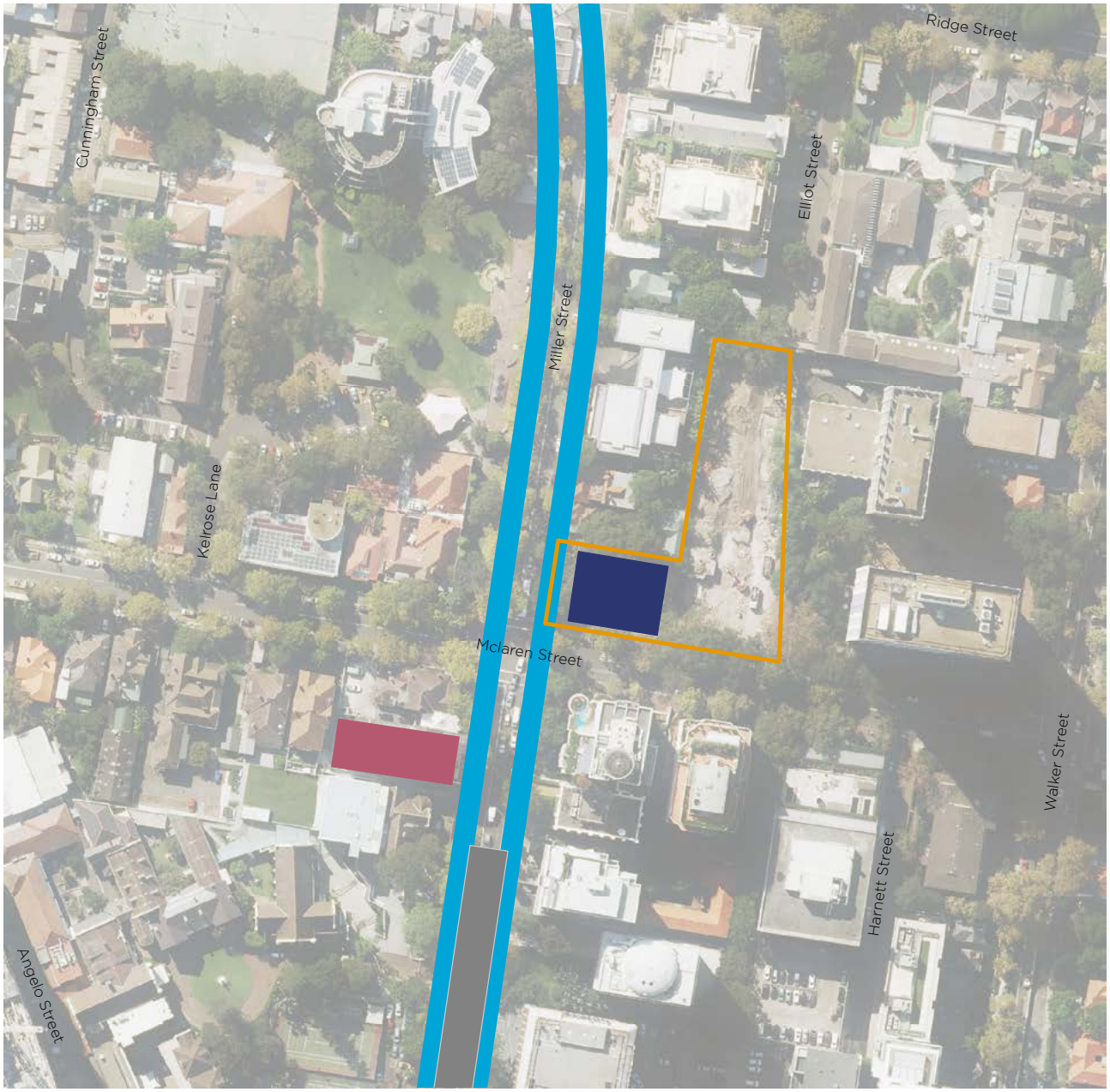

Figure 1-1 Location of the proposed Victoria Cross Station modification

Figure 1-2 Location of the proposed Artarmon substation modification

1.4 Purpose of this report

During public exhibition of the modification report, ten submissions were received by the Department of Planning and Environment. The Secretary of Department of Planning and Environment provided copies of the submissions to Transport for NSW.

This report provides:

- Clarifications to the information presented in the modification report
- An overview of consultation that has occurred during and after the public exhibition period
- A summary of the issues raised during the modification report public exhibition period
- Responses to the issues raised in submissions.

The structure and content of this report are outlined in Table 1-1.

Table 1-1 Structure of this report

Chapter	Description
Chapter 1	**Introduction (this chapter)** Provides an overview of the proposed modifications and outlines the purpose and content of this report.
Chapter 2	**Modification report clarifications** Provides clarifications to the information presented in the modification report.
Chapter 3	**Community and stakeholder involvement** Provides details of the consultation, and community and stakeholder involvement activities carried out during the development of the modification report, during exhibition of the modification report and future consultation should the proposed modifications be approved.
Chapter 4	**Submissions received** Provides a summary of the submissions received during the public exhibition of the modification report.
Chapter 5	**Government submissions** Identifies the issues raised by government agencies and local councils and provides responses to those submissions.
Chapter 6	**Community submissions** Identifies the issues raised by major stakeholders and educational facilities and provides responses to those submissions.
Chapter 7	**Revised consolidated environmental mitigation measures** Presents an updated consolidated list of environmental mitigation measures for the project.

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MODIFICATION REPORT CLARIFICATIONS

CHAPTER TWO

2 Modification report clarifications

This chapter clarifies information included in the modification report. The following clarifications are provided:

- Inconsistencies in the construction noise assessment
- Over station development provision and future use of residual land at the Victoria Cross Station northern entry
- Management of trees on the Miller Street and McLaren Street frontages at the Victoria Cross Station northern entry
- Revised setbacks for the Victoria Cross Station northern entry
- Revised setbacks for the Artarmon substation.

2.1 Construction noise assessment

The modification report included the following inconsistencies and missing data:

- Missing results in Table 10-14 in relation to ground-borne noise exceedance levels for residential receivers in Area D at Victoria Cross Station. This data was missing from Chapter 10 of the modification report, but was available in Appendix B to the modification report. A revised table including the missing data in ***bold italicised*** text is provided in Table 2-1.
- Inconsistencies between Table 10-14 and 10-15 in relation to ground-borne noise exceedance levels at Victoria Cross Station. Revised tables including the corrected data in **bold** text are provided in Table 2-1 and Table 2-2.
- Incorrect receiver mapping for Artarmon substation with a number of commercial receivers to the south of the Gore Hill Freeway incorrectly identified as residential. The results presented in the modification report were for the correct receiver types. A revised receiver area map is provided as Figure 2-1.

Table 2-1 Victoria Cross Station predicted ground-borne noise level exceedance in relation to shaft excavation works

Receiver area	Type	Shortest distance to vibration intensive works (m)	NML				Ground-borne noise[1]		NML exceedance							
			Day	DOOH	EVE	Night	$L_{Aeq(15min)}$ (dBA)		Day		DOOH		EVE		Night	
							A	B	A	B	A	B	A	B	A	B
A	RES	5	45	45	40	35	37	75	0	30	0	30	0	n/a	2	n/a
B	COM	7	50	50	n/a	n/a	**36**	**72**	0	**22**	0	**22**	n/a	n/a	n/a	n/a
C	RES	20	45	45	40	35	25	60	0	15	0	15	0	n/a	0	n/a
D	RES	***55***	***45***	***45***	***40***	***35***	***15***	***41***	***0***	***0***	***0***	***0***	***0***	***n/a***	***0***	***n/a***
E	EDU	35	45	n/a	n/a	n/a	19	50	0	5	n/a	n/a	n/a	n/a	n/a	n/a

1 Activities relate to the following: A. Rock drilling with non-percussive rock drill, B. Excavation and trimming with rockbreaker

Table 2-2 Victoria Cross Station comparison of predicted ground-borne noise level exceedances with the approved project

Activity	Receiver category	NML exceedance category[1]	
		Approved project	Proposed modification
All works activities	Commercial	-(3)[2]	3
	Residential	-(3)[2]	3
	Educational	-(3)[2]	1
	Theatre / Recording Studio	3	0

1 NML exceedance categories: 0 = NML compliance, 1 = NML exceedance of less than 10dB, 2 = NML exceedance between 10dB and 20dB, 3 = NML exceedance of more than 20dB

2 Results not presented in the Environmental Impact Statement are denoted with a '-'. Results presented in (parentheses) represent assumed noise level exceedance categories based on the assumptions presented in the Environmental Impact Statement.

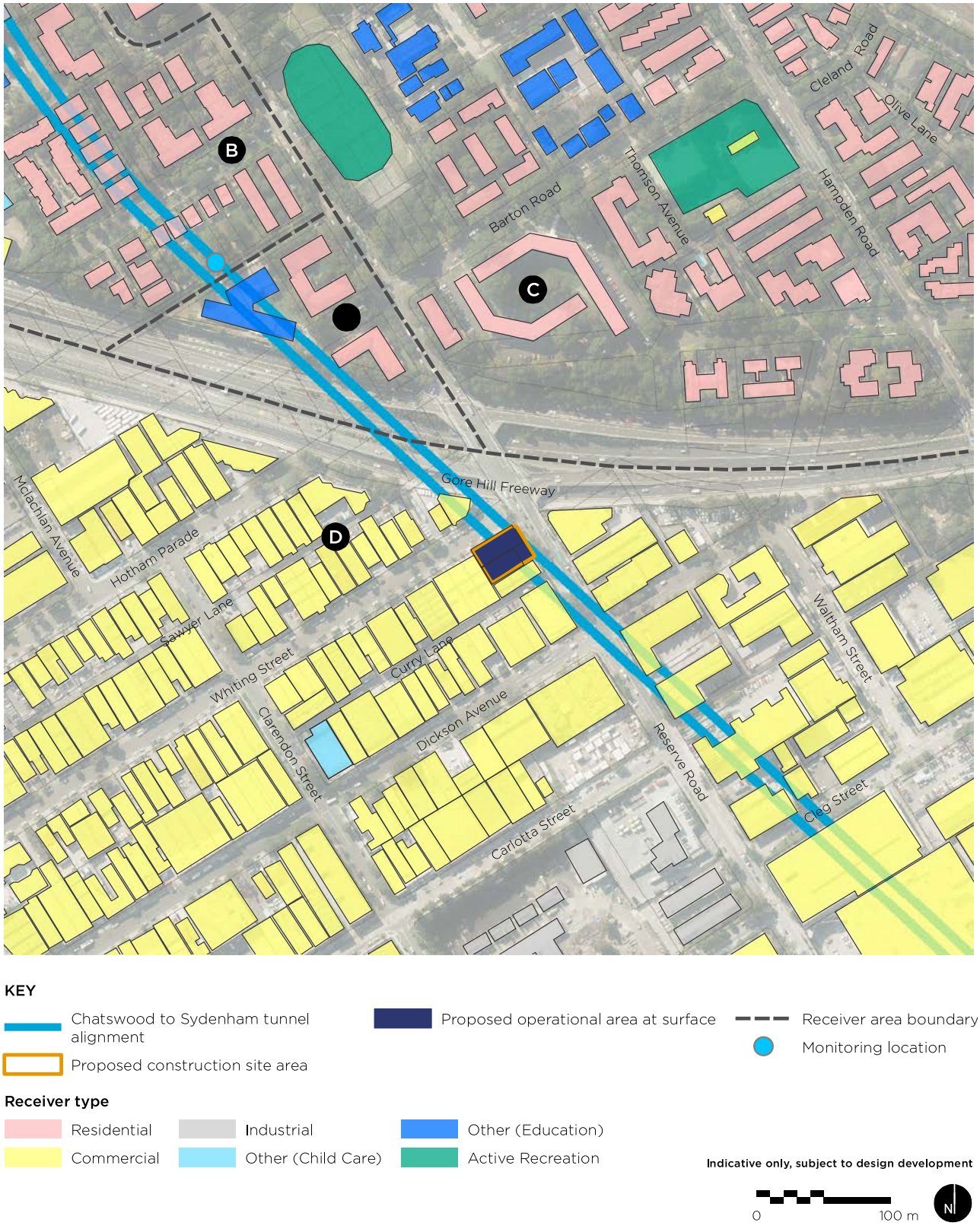

Figure 2-1 Noise catchment areas – Artarmon substation

2.2 Victoria Cross Station northern entry – over station development and use of residual land

Any future redevelopment of the site, including any potential over station development, would be subject to a separate planning approval process.

Transport for NSW will review opportunities for any possible future uses and any surplus land will be sold consistent with Transport for NSW property disposal guidelines.

2.3 Victoria Cross Station northern entry – management of trees

The modification report indicates that the single Port Jackson fig (*Ficus rubiginosa*) on the Miller Street frontage would be retained. However, following further design development, it is now proposed that this tree be removed due to likely impacts on the construction of the proposed entry plaza and on pedestrian movements and wayfinding at the entry plaza during operation of the station.

Consultation with North Sydney Council about the removal of this tree indicated that the tree is located on private property, is self-sown and is not of particular significance. Council indicated it is not opposed to removal of the tree. More suitable landscape treatments would be implemented at the station entry and surrounds.

The proposed modification would encroach (by 11.2 per cent) into the tree protection zone of the closest Morton Bay fig (*Ficus macrophylla*) on the McLaren Street frontage. This cannot be avoided by moving the excavation further east because a three metre offset needs to be maintained between the tunnels beneath Miller Street and the station excavation to ensure structural integrity. The structural root zone of this tree would be unaffected and preliminary assessment by an arborist has indicated the extent of the proposed tree protection zone encroachment is acceptable and unlikely to result in damage to the tree that would require its removal. This tree has however experienced partial loss of its root zone from previous construction works and there is some uncertainty about specific location of major roots. Further assessment by an independent, experienced and suitably qualified arborist would be undertaken during the preparation of the Tree Report required by Condition E6.

Temporary facilities (i.e. acoustic enclosure, gantry crane, and construction access) would be, where possible, designed to avoid further encroachment into the tree protection zone of the affected Morton Bay fig, although some tree pruning may be required. The extent of tree pruning would be identified in consultation with an arborist.

A second Morton Bay fig located further to the east would not be affected by the proposed modification. Other vegetation on the proposed modification construction site would be removed, subject to the requirements of Condition E6.

While there is expected to be some encroachment into the tree protection zone and structural root zone for trees located on the southern boundary of 243 Miller Street, inspection by a qualified arborist has indicated that the majority of the roots of these trees are likely to be located to the north due to the presence of the rock wall on the southern side. While impacts on these trees are not expected, further investigation to confirm this through digging or the use of ground penetrating radar is not possible at this time due to the presence of fibrous roots from palm trees that were previously planted at this location. Initial excavation works would therefore occur under the supervision of an arborist.

2.4 Victoria Cross Station northern entry – revised setbacks

The modification report indicates that relevant development controls in the *North Sydney Local Environmental Plan 2013* (North Sydney LEP) and the *North Sydney Development Control Plan 2013* (North Sydney DCP) would be considered in the design of the station entry / services building, including the 12 metre setback to Miller Street required by clause 6.4 of the North Sydney LEP.

Following further design development, it has been identified that to achieve the 12 metre setback to Miller Street while maintaining the required building function, the height of the station entry / services building would need to be increased by about five metres.

Encroachment of the 12 metre Miller Street setback is now required in order to minimise the height of the station entry / services building and a setback of around 6.8 metres is now proposed. This is a larger setback than for the adjacent properties to the north and would still allow a generous pedestrian plaza at ground level. Preliminary consultation with North Sydney Council has occurred regarding the encroachment of the Miller Street setback and no substantive issues have been raised.

The setback to McLaren Street has been reduced from 4.5 metres to 1.2 metres. This was required to allow an increase in the setback to the boundary with 243 Miller Street (to around 3.3 metres) and reduce potential impacts on several trees at that location. The revised setbacks are shown in plan view on Figure 2-2 and as a cross section (for the Miller Street setback) on Figure 2-3.

The landscape character impact rating (minor beneficial) and visual impact rating (minor beneficial for the relevant viewpoints 1 and 3) included in Table 14-8 and Table 14-9 of the modification report remain valid with the revised setback and the removal of additional trees. Removal of the Port Jackson Fig on the Miller Street frontage would allow greater visibility of the entry plaza and appropriate emphasis on this prominent corner site, while retaining scope for more appropriately positioned and selected replacement plantings. The screening this tree offers is considered less important than that provided to the northern and southern elevations of the building by trees along the northern boundary and on the McLaren Street frontage. The reduction of the Miller Street setback would still allow a minor beneficial visual outcome to be achieved because the proposed setback is still sufficient to allow implementation of the new visually open and transparent station entry and plaza.

Figure 2-2 Revised setbacks – Victoria Cross Station

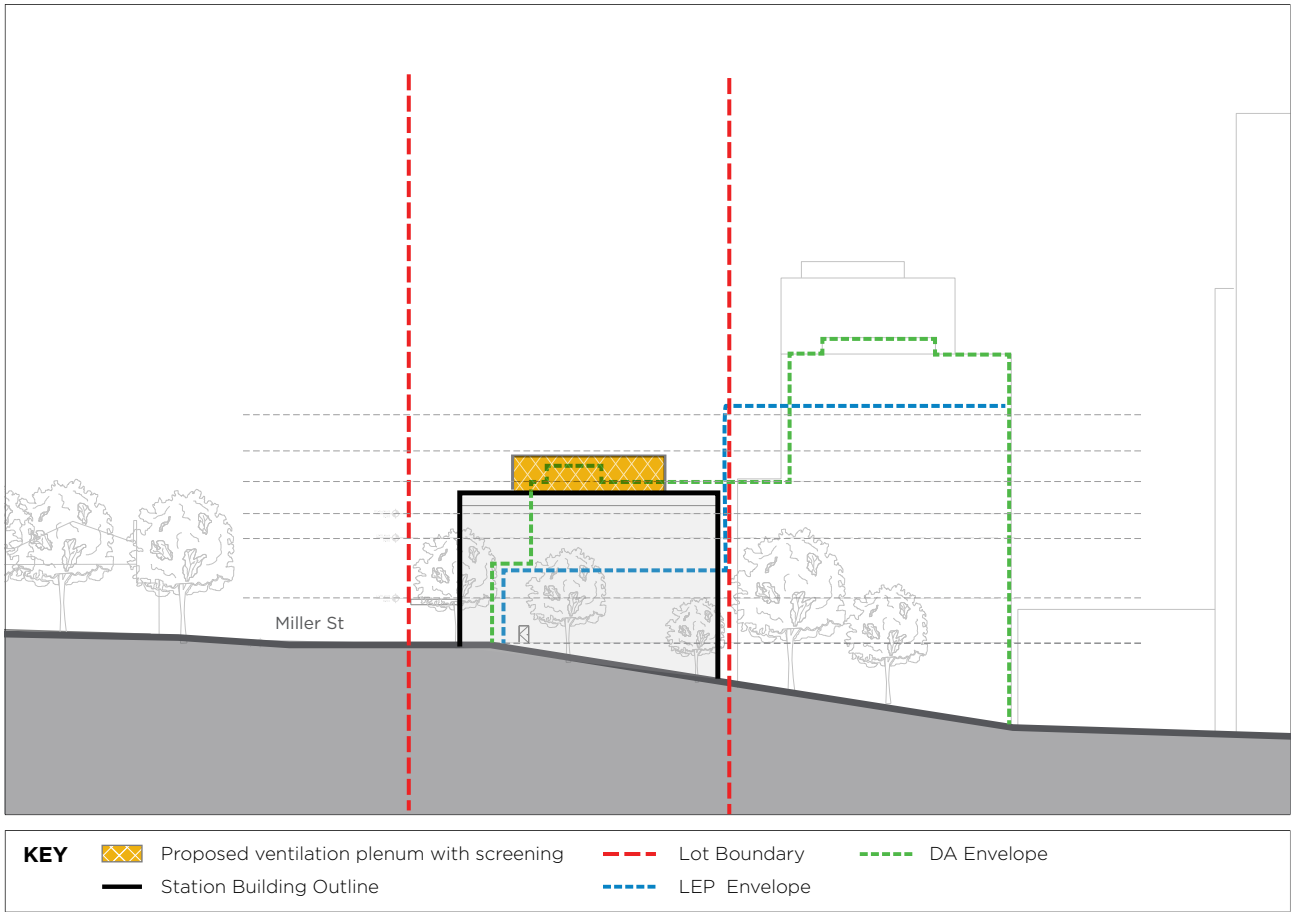

Figure 2-3 Revised setbacks (cross section) – Victoria Cross Station

2.5 Artarmon substation – revised setbacks

The modification report identified an approximate setback of one metre from the Reserve Road boundary and four metres from the Whiting Street boundary.

As part of further design development, it has been identified that to achieve these setbacks while maintaining the required building function, the height of the substation would need to be three storeys (or around 15 metres above the level of Reserve Road). This would result in the Reserve Road and Whiting Street building elevations exceeding that of nearby reference buildings (Freeway Hotel and Cage Security respectively).

It is now proposed that the building setback to Reserve Road be 0.72 metres and the setback to Whiting Street be 0.04 metres (shown on Figure 2-4). This would allow the building height to be retained at two storeys (or around eight metres above the level of Reserve Road) and equivalent to the Freeway Hotel and the Cage Security building. The proposed landscaped buffer along the Whiting Street frontage cannot be provided as previously proposed, however this is consistent with the sections of Whiting Street to the west where no landscaped buffer is provided in front of the buildings.

In terms of landscape character impact, the modification report indicates that there would be a negligible impact because the proposed substation building would have a consistent built form scale and character to the surrounding light industrial built form, and the Whiting Street streetscape would be reinforced with a landscape buffer. While the landscape buffer would no longer be provided, the negligible impact rating is still appropriate because:

- The proposed setback to Whiting Street is not a significant departure from the existing situation
- The absence of a landscape buffer on Whiting Street is consistent with the sections of Whiting Street to the west
- The proposed setback to Reserve Road would be similar to the existing situation and the mature trees on the road verge would be retained
- The building height would be two storeys (or around eight metres above the level of Reserve Road) and equivalent to nearby reference buildings (Freeway Hotel and the Cage Security building).

In terms of visual impact, the modification report indicates there would be negligible visual impact due to the compatibility of the proposed substation building with the existing industrial landscape setting and the proposed landscape buffer on Whiting Street, which would filter views to the proposed buildings. With the revised setbacks, the substation building would still be compatible with the existing industrial setting, however views from Viewpoint 1 (Reserve Road north) and Viewpoint 3 (Whiting Street) would no longer be filtered by the previously proposed landscape buffer. Notwithstanding, there would be no change to the negligible visual impact rating as, with appropriate facade treatment, there would not be significant visual contrast with the scale and character of the surrounding built form.

Figure 2-4 Revised setbacks – Artarmon substation

The proposed setbacks to both Reserve Road and Whiting Street are less than those specified by the *Willoughby Development Control Plan*, which are three metres and 1.5 metres respectively. This variation is considered justified in order to limit the building height to two storeys and maintain a consistent height with nearby reference buildings. It is also noted that the existing building does not comply with the setbacks specified by the *Willoughby Development Control Plan*. The visual impact of the proposed substation building would be minimised through the design of an appropriate architectural treatment of the façades.

Preliminary consultation with Willoughby Council has occurred regarding the proposed revised setbacks and no substantive issues have been raised.

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COMMUNITY AND STAKEHOLDER INVOLVEMENT

CHAPTER THREE

3 Community and stakeholder involvement

This chapter reviews the consultation that has occurred in relation to the proposed modification and describes proposed consultation activities during the construction phase.

3.1 Consultation overview

Engagement with the community and stakeholders about Sydney Metro City & Southwest began in June 2014 and continued through the preparation of the Chatswood to Sydenham Environmental Impact Statement.

Early consultation with key stakeholders that was related to the proposed modification occurred from late 2016 through to the middle of 2017, prior to the exhibition of the modification report.

The modification report was exhibited from 7 June 2017 to 5 July 2017. During this time, consultation activities were carried out to engage key stakeholders and the community on information in the modification report, encourage participation and provide guidance on the submissions process.

Submissions on the proposed modification were received by the NSW Department of Planning and Environment during the exhibition period. The issues raised, and responses to them, are presented in Chapters 5 and 6 of this submissions report.

3.2 Consultation prior to modification report exhibition

3.2.1 Victoria Cross Station

Preliminary discussions with Wenona School and Uniting Care occurred in early 2017 to advise that alternative options were being explored for the location of the northern services building and to seek early feedback. Further discussions were held during May 2017 to provide an update and details of the forthcoming public exhibition process. Consultation was also undertaken with North Sydney Council, Monte Sant' Angelo Mercy College and Rydges North Sydney. Other schools in the surrounding area including St Mary's Primary School, North Sydney Boys High School and Marist College North Shore were also contacted.

Residents and businesses in the vicinity of the proposed site were contacted by telephone, email or door knock during May 2017 to explain that alternative options for the northern services building had been investigated and a preferred option identified at 50-52 McLaren Street. Information about the forthcoming public exhibition process and opportunities to make a submission on the modification report was also provided.

Issues raised during this consultation were considered in the development of the proposed modification and the preparation of the modification report.

3.2.2 Artarmon substation

In November 2016, Sydney Metro distributed a project update which advised that as a result of feedback received during the Environmental Impact Statement public exhibition period, further design work had occurred and an alternative location for the Artarmon substation had been identified at 98-104 Reserve Road, within the Artarmon industrial area. The release of the project update was accompanied by doorknocking of ten properties and 19 businesses.

Follow-up contact was made during May 2017 to advise that further assessment of the alternative location for the substation had continued and a modification report would be on public exhibition the following month. Information about the opportunities to review the report and provide feedback were also discussed.

Issues raised during this consultation were considered in the development of the modification report.

3.3 Consultation during and after modification report exhibition

The modification report was made available to view on the Department of Planning and Environment's website: www.majorprojects.planning.nsw.gov.au while a modification summary report was made available on the project website: www.sydneymetro.info.

Hard copies of the document were also available at Community Information Sessions and at the following locations:

- Willoughby Council:
  - Customer Service Centre: Level 4, 31 Victor Street, Chatswood
  - Chatswood Library on The Concourse: 409 Victoria Avenue, Chatswood
  - Artarmon Library: 139 Artarmon Road, Artarmon
- North Sydney Council:
  - Customer Service Centre: 200 Miller Street, North Sydney
  - Stanton Library: 234 Miller Street, North Sydney
- Lane Cove Council:
  - Customer Service Centre: 48 Longueville Road, Lane Cove.

The Sydney Metro project team supported the public exhibition of the modification report through a variety of engagement methods and communication materials, as outlined below.

3.3.1 Community contact and information points

Table 3-1 outlines community contact and information points in use on the project.

Table 3-1 Community contact and information points

Activity	Detail
Community information line (toll free)	1800 171 386
Community email address	sydneymetro@transport.nsw.gov.au
Website	www.sydneymetro.info
Postal address	Sydney Metro City & Southwest: PO Box K659, Haymarket, NSW 1240
Transport for NSW community information centre	388 George Street, Sydney

3.3.2 Community information sessions

The project team hosted a series of community information sessions where displays and information about the proposed modification were available.

All members of the community were invited to attend these sessions and meet expert members of the project team and have any questions answered. Visitors could drop in anytime within the advertised times.

There were 80 visitors at the three community information sessions. Table 3-2 outlines the date, time and location of community information sessions.

Table 3-2 Community information sessions

Date and time	Location	Attendees
Saturday 17 June, 10am – 1pm	Fred Hutley Hall: 200 Miller St, North Sydney	39
Tuesday 20 June, 3pm – 7pm	Fred Hutley Hall: 200 Miller St, North Sydney	39
Thursday 22 June, 4pm – 7pm	Freeway Hotel: 115 Reserve Road, Artarmon	2

Invitations to attend the sessions were included in:

- Postcard flyers delivered to properties near both sites
- The Modification Summary document
- The Sydney Metro website
- Advertisements in local newspapers
- The Sydney Metro Facebook feed.

At the information sessions, copies of the modification report were available for visitors to view as were copies of the Modification Summary and project newsletter. Information boards were also presented around the room with key information regarding the approved project and the proposed modification.

3.3.3 Stakeholder engagement

Consultation with North Sydney Council occurred following the exhibition of the modification report to discuss proposed setbacks to Miller Street and the proposed removal of a one Port Jackson fig tree on the Miller Street frontage. This included a meeting with Council officers on 4 August 2017. As noted in Chapter 2 (Modification report clarifications) of this submissions report, Council raised no substantive issues in relation to a reduced setback to Miller Street or the proposed removal of the Port Jackson fig tree on the Miller Street frontage.

Consultation with Willoughby City Council occurred following the exhibition of the modification report to discuss the proposed revised setbacks. This included a meeting with Council officers on 8 August 2017. As noted in Chapter 2 (Modification report clarifications) of this submissions report, Council raised no substantive issues in relation to the revised setbacks for the Artarmon substation.

3.3.4 Place Managers

Place Managers build relationships and act as a feedback mechanism to help ensure community and stakeholder aspirations are consistently considered in the planning process. Their role is to be a direct point of contact between affected members of the community and the project team.

Place Managers will continue to play a vital role in maintaining close and ongoing contact with local communities and stakeholders during the design and delivery of Sydney Metro.

Place Managers engaged impacted residents, tenants and businesses throughout the exhibition period (by phone, email, newsletter or doorknock) to ensure they were aware of the modification report, invite them to community information sessions and ensure they had the information they needed to make a submission on the proposed modification.

Place Managers can be contacted via the community information line (1800 171 386) or project email (sydneymetro@transport.nsw.gov.au).

3.3.5 Postcard flyers

Postcard flyers were developed to provide information about the proposed modification and advise the date and location of community information sessions. These flyers were delivered to properties located within 500 metres of each modification site.

3.3.6 Newspaper advertisements

Advertisements advising of the public exhibition of the proposed modification were placed in the following newspapers:

- Australian Chinese Daily – 9 June
- Mosman Daily – 8 June
- North Shore Times – 8 June.

3.3.7 Email alerts to the project mailing list

Details regarding the proposed modification and the community information sessions were sent via email to 200 people on the project mailing list on 7 June 2017.

3.3.8 Facebook

Sydney Metro posted invitations and reminders regarding the community information sessions on its Facebook feed which has over 13,500 followers.

3.3.9 Website

Information on where to view the modification report and the community information sessions was made available on the project website on 7 June 2017.

Information on where to view the modification report and how the community can have their say was made available on the NSW Government's 'Have your Say' community engagement website on 7 June 2017.

3.3.10 Modification report summary document

A modification report summary document was prepared and made available electronically on the project website and also in hard copy. Hard copies were available at the community information centres, community information sessions, via place managers and other team members during meetings, briefings, doorknocks, and by request.

This summary document provided an overview of the approved Chatswood to Sydenham component of Sydney Metro City & Southwest and the proposed modification. Readers were also encouraged to review the modification report on the Department of Planning and Environment's website.

3.4 Consultation and engagement during construction

Should the proposed modification be approved, the project team would continue to consult with the community and key stakeholders during the planning and construction of the project. In general, this ongoing consultation would involve:

- Provision of information to key stakeholders, local councils and other government agencies
- Provision of regular updates to commuters and the nearby community.

Further details regarding stakeholder and community involvement requirements during project delivery are outlined in the Construction Environmental Management Framework (provided as part of the Submissions and Preferred Infrastructure Report for the approved project).

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SUBMISSIONS RECEIVED

CHAPTER FOUR

4 Submissions received

4.1 Respondents

The Department of Planning and Environment received ten submissions in response to the modification report during the public exhibition period (7 June 2017 and 5 July 2017). Submissions were accepted by:

- Electronic submission (online) – www.majorprojects.planning.nsw.gov.au/page/on-exhibition
- Post – Department of Planning and Environment, GPO Box 39, Sydney, NSW 2001.

The number of submissions received by respondent type is presented in Table 4-1.

Table 4-1 Submissions received by respondent type

Respondent type	Number of submissions
Government agency	3
Local council	2
Community, business and other	5
Total	**10**

4.2 Overview of issues raised

In general submissions were supportive of the proposed modifications, particularly the provision of an additional station entry at the Victoria Cross Station. However submissions also raised issues with some aspects of the proposed modifications. Responses to each submission are provided in Chapters 5 and 6.

4.2.1 Government agencies

Three government agencies made submissions, raising a range of issues relevant to their respective areas of interest and responsibility. A summary of each agency's issues is provided below. Detailed responses are provided in Chapter 5.

Environment Protection Authority

The submission from the NSW Environment Protection Authority raises issues regarding:

- Potential contamination at the proposed Artarmon substation site and the treatment of water prior to discharge
- The water quality prior to discharge at the proposed Victoria Cross Station site
- Issues associated with the construction noise assessment and changes to construction noise levels at nearby receivers.

NSW Heritage Council

The submission from the NSW Heritage Council identifies the potential changes in impacts to built non-Aboriginal heritage items, and potential inconsistencies in relation to the archaeological assessment at the proposed Victoria Cross Station site.

NSW Department of Primary Industries

The submission from the NSW Department of Primary Industries suggests the proposed modification represents a significant change in the groundwater management at Artarmon substation from a tanked design to a drained design. It also queries whether the groundwater management approach for Victoria Cross Station is proposed to be changed to a drained design in line with that of Victoria Cross Station shaft.

The submission asks that, if changes to the groundwater management approach are proposed, the following be provided:

- An assessment of the specific impacts of each structure under the modified design
- Details on the changes to the volume of groundwater that is likely to be taken
- An assessment of the potential long-term water quality impacts on the groundwater
- Details on how the monitoring and reporting arrangements will be adopted to track the impacts and to meet the water management legislation requirements
- Justification for design changes leading to increased impacts.

4.2.2 Local councils

Two local councils made submissions, raising issues associated with the proposed infrastructure within their respective local government areas. A summary of each council's issues is provided below. Detailed responses to the issues raised by local councils are provided in Chapter 5.

North Sydney Council

North Sydney Council is generally supportive of the proposal to relocate the Victoria Cross Station services building, particularly as it facilitates the provision of an additional station entry servicing the northern end of the North Sydney CBD and adjoining precincts. The submission also identifies that this aligns with Council's desire for a northern entry as identified in its Sydney Metro Planning Study (2017).

The submission also identifies issues in relation to:

- The proposed increase in construction vehicle movements at the northern construction site and the proposed haul route for these vehicles
- Issues associated with the design including impacts arising from the provision of taxi and kiss-and-ride spaces at the proposed northern entry, the location of the proposed entry plaza, the desire for a through site link between McLaren and Elliot streets, and the built form of the entry building
- Issues associated with potential future over station development and use of residual land
- Potential impacts to the adjacent heritage item.

Willoughby City Council

The submission from Willoughby City Council identifies that the proposed site for the Artarmon substation has been appropriately assessed in relation to contamination impacts, and the measures to address these potential impacts have been addressed. Council considers that the proposed site for the substation is acceptable.

4.2.3 Community and other stakeholders

Two schools, one business and one individual made submissions, raising a range of issues relevant to their respective areas of interest. A submission was also made on behalf of a strata plan. A summary of the issues raised is provided below.

- Management of construction traffic
- Pedestrian connectivity
- Assessment process for construction and operational noise
- Impacts of construction and operational noise
- Construction traffic noise, particularly during the evening and night-time periods
- Over station development and the potential redevelopment of residual land
- Building setbacks
- Impacts on existing building basements
- Impacts on trees
- Access for less mobile people.

Detailed responses are provided in Chapter 6.

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GOVERNMENT SUBMISSIONS

CHAPTER FIVE

5 Government submissions

5.1 Environment Protection Authority

5.1.1 Groundwater

Issue raised

The Environmental Impact Statement states that groundwater generally has elevated iron and manganese and low pH in the Hawkesbury Sandstone and that seepage into the dive structures and shaft excavations at volumes up to 11.8 L/s are likely across the whole project.

The Environmental Impact Statement also states that the discharge water quality level would be determined in consultation with the EPA during reference design, considering the current water quality of the receiving watercourse. The proponent should note that discharge criteria are not derived with reference to the receiving water quality but the maintenance or restoration of the environmental values of the receiving waters. The ANZECC (2000) Guidelines recommend that guideline trigger values for slightly–moderately disturbed systems are applied to highly disturbed ecosystems wherever possible.

1. For both sites, the proponent should assess the potential impact of discharges on receiving waters, including but not be limited to:
    a. identify and estimate the quality and quantity of all pollutants that may be introduced into the water cycle by source and discharge point, including residual discharges after mitigation measures are implemented
    b. a statement of the ambient Water Quality Objectives (WQOs) and the environmental values for the receiving waters relevant to the proposal
    c. a statement of the indicators and associated trigger values or criteria for the identified environmental values
    d. assessment of the significance of any identified impacts on surface waters including the relevant ambient water quality outcomes
    e. demonstration that any discharge water quality is consistent with at least the 95 per cent protection level for freshwater and/or marine ecosystems during the construction and operation phases. Contaminants that bio-accumulate should have a 99 per cent protection level.
2. The proponent should also demonstrate how the proposal will be designed and operated to:
    a. protect the WQOs for receiving waters where they are currently being achieved
    b. contribute towards achievement of the WQOs over time where they are not currently being achieved.

Response

Sections 8.1 and 8.2 of the modification report identify that there would not be any additional water quality risks associated with the proposed modification compared to those identified for the approved project in the Environmental Impact Statement.

As noted in Chapter 17 (Groundwater and geology) of the Environmental Impact Statement, captured groundwater (and other tunnel water) would be treated to meet requirements to be determined in consultation with the Environment Protection Authority. Further, consistent with mitigation measure SCW7, discharges from the tunnel water treatment plant would be monitored to ensure compliance with the discharge criteria determined in consultation with the Environment Protection Authority.

Issue raised

The approved Artarmon substation was not near potential sites of contamination. The modification is in a site of potential contamination. The site has been used for commercial/industrial operations (currently auto-mechanical) which may have led to the presence of heavy metals, hydrocarbons and solvents in the soil and groundwater.

The Artarmon substation modification does not mention water treatment, however the EIS includes a water treatment plant treating water for pH, total suspended solids, and oil and grease only.

The proponent should confirm if a wastewater treatment plant will be used to treat groundwater before discharge to surface water. The potential contaminants and associated impact should also be considered.

Response

Potential contamination at the proposed Artarmon substation site is considered in Chapter 16 (Contamination) of the modification report. The assessment found the potential for contamination at the site due to past demolition of residential buildings, as well past and current commercial / industrial land use of site and surrounding area. Potential contaminants were identified as heavy metals, hydrocarbons, solvents, pesticides and asbestos. Existing conditions of approval address risks associated with potential contamination at the proposed Artarmon substation site, including Conditions E66 and E67 (Site Contamination Report), Condition E68 (Site Audit Statement and Site Audit Report), and Conditions E69 and E70 (Unexpected Contaminated Land and Asbestos Finds Procedure).

The Artarmon substation construction site would include a water treatment plant, the indicative location of which is shown in Figure 7-2 of the modification report. During operation, groundwater inflows (and other tunnel water) would be treated at a tunnel water treatment plant located adjacent to the Marrickville dive structure.

Section 18.4.2 of the Environmental Impact Statement does not restrict treatment of groundwater to any particular parameters. Rather, the project commits (in mitigation measure SCW4) to complying with the discharge requirements of an Environment Protection Licence issued for the project. Consistent with other recent tunnelling projects, Section 18.4.2 of the Environmental Impact Statement noted that these discharge requirements are predicted to be:

- pH – 6.5 to 8.5
- Total suspended solids – less than 50 milligrams per litre
- Oil and grease – none visible.

The details of water collection and treatment (such as collection of inflows until sufficient volumes have been reached and then treating and discharging in bulk, or continuously treating and discharging collected water) would be determined as part of detailed construction planning.

Issue raised

At Victoria Cross Station, the tunnel water would be treated onsite with a water treatment plant and discharged. The modification states, the *"groundwater would be treated to meet the requirements of the environment protection licence for the project, which are anticipated to be:*

- *pH – 6.5 to 8.5*
- *Total suspended solids – less than 50 milligrams per litre*
- *Oil and grease – non visible."*

The Environment Protection Authority notes that these requirements are potentially inadequate to protect receiving waters and does not consider all potential pollutants. To issue discharge criteria for an Environment Protection Licence, the discharge must be characterised and the potential impact of all potential pollutants assessed.

Response

The proposed modification at Victoria Cross Station would not result in any change to potential impacts associated with the discharge of groundwater inflows.

Section 18.4.2 of the Environmental Impact Statement does not restrict treatment of groundwater to any particular parameters. Rather, the project commits (in mitigation measure SCW4) to complying with the discharge requirements of an Environment Protection Licence issued for the project. Consistent with other recent tunnelling projects, Section 18.4.2 of the Environmental Impact Statement predicts likely discharge requirements.

Condition E107 also requires that the project be constructed and operated so as to maintain the *NSW Water Quality Objectives* where they are being achieved, and contribute towards achievement of the *NSW Water Quality Objectives* over time where they are not being achieved, unless an Environment Protection Licence contains different requirements.

Transport for NSW acknowledges that different discharge requirements may be imposed by the Environment Protection Authority and will continue to consult with the Environment Protection Authority regarding proposed treated discharges across the project, including at Victoria Cross Station. More specific information regarding proposed discharge at each location will be provided as part of a future Environment Protection Licence application to assist the determination of discharge criteria.

The details of water collection and treatment (such as collection of inflows until sufficient volumes have been reached and then treating and discharging in bulk, or continuously treating and discharging collected water) would be determined as part of detailed construction planning.

5.1.2 Noise and Vibration

Issue raised

Predicted construction noise levels exceed the noise management levels (NMLs) on fewer occasions, and by lesser amounts, for the proposed modification compared with the approved project. This is presented as a reduction in overall impact, which is correct; however, the impact affects receivers who may not have been impacted previously. Those impacted by the proposed modification will experience it as an increase over the impact they would have experienced from the approved project. The proponent should acknowledge that those impacted by the proposed modification will experience it as an increase of the impact they would have received from the approved project.

Response

It is acknowledged that while the proposed modification reduces the overall noise impacts of project, some receivers would experience increased noise when compared to the approved project. The expected changes in noise impacts associated with the proposed modification are detailed in Chapter 10 and Appendix B of the modification report, subject to the clarifications included Chapter 2 of this submissions report.

Issue raised

NMLs for noise sensitive locations near the proposed works are based on monitoring results from a location immediately adjacent to Miller Street. Miller Street appears to be a busier road than McLaren and Walker streets, which are the streets adjoining some of the noise sensitive locations near the proposed works. Background noise levels at other noise sensitive locations are therefore likely to be lower, particularly those locations to the east and north of the proposed construction site area. The proponent should evaluate the potential for this and make any necessary adjustments to the NMLs.

Response

The ambient (background) noise monitoring location closest to the northern construction site was at 237 Miller Street. This location is on the nearest southern residential building to the proposed modification site, although it is oriented towards Miller Street rather than McLaren Street. The building has apartments on levels 1 and above and review of the graphical results did not show any anomalies.

All of the potentially most affected residential receivers are within 160 metres of the noise monitoring position and the results were free from anomalies. The results are therefore considered to be suitable for the setting of construction NMLs at this stage of assessment. Further monitoring would be conducted at a receiver addressing McLaren Street during the preparation of the Construction Noise and Vibration Impacts Statements required by Condition E33 to confirm the applicable NMLs. An additional mitigation measure (NV10) has been included in Chapter 7 of this submissions report to capture this commitment.

Issue raised

The modification report adopts a sleep disturbance noise management level of 55dBA internal / 65dBA external. This appears to be based on guidance in the Road Noise Policy (RNP). However, the RNP guidance is in relation to "awakenings" not sleep disturbance. Sleep disturbance may occur without awakening. The proponent should confirm whether their proposed sleep disturbance noise management level is based on awakenings, and justify why it is not based on the background + 15 level for sleep disturbance in the relevant *Industrial Noise Policy* (INP) application note. Otherwise the proponent should propose a sleep disturbance management level that is based on sleep disturbance, rather than awakenings.

Response

As noted in Section 10.2 of the modification report and consistent with the approach on other major infrastructure projects, the approach to assessing potential sleep disturbance was to apply an initial screening criterion of background plus 15 dB (as described in the Application Notes to the INP), and to undertake further analysis if the screening criterion cannot be achieved.

Table 10-16 of the modification report presents results for road traffic noise against both the sleep disturbance screening criteria (background plus 15 dB) as per the INP and the external L_{Amax} noise level of 65 dBA (which the RNP indicates is the level below which awakening reactions are unlikely to occur).

Issue raised

In relation to predicted ground-borne noise impacts in Table 10-14, the summary of results includes that the NML is exceeded by 2dB at residences in Area A during the night-time for rock drilling. A statement then follows that rock drilling could therefore operate 24 hours per day without ground-borne NMLs being exceeded, which is a direct contradiction of the previous statement. The proponent should clarify ground borne noise levels for rock drilling, at residences in Area A during the night-time.

Response

Table 10-14 identifies that works requiring the use of rock-drilling would not generate ground-borne noise exceedances at the most potentially affected receivers during any day-time or evening period, with only minor ground-borne noise exceedances of up to 2 dB at the most potentially affected residential receiver in NCA A during the night-time period. Given the minor nature of the predicted night-time exceedance, there is potential for excavation activities using non-percussive rock drills to operate 24/7 if works can be modified so as to achieve the night-time NMLs. This would be subject to verification.

Issue raised

The conditions of approval for the approved project should apply to the modified project, if approved. The approval for the project includes conditions that apply to all works forming part of the project. The conditions are appropriate for the modified project and should be applied if the modification is approved.

Response

If approved, the existing conditions of approval would apply to the proposed modification. This is acknowledged in the modification report.

5.1.3 Contaminated soil and water

Issue raised

The assessment methodology applied for contamination as described in Section 16.1 indicates the methodology will include review of publicly available data and web-based information searches, including the Contaminated Sites Register and Record of Notices (NSW Environment Protection Authority, 2015). The Environment Protection Authority notes that the public register is updated regularly, and as such should be dated to the current year, not 2015.

The strategy for the assessment and management of the contamination appears appropriate and includes the provision of a site auditor if remedial works are deemed necessary. The Environment Protection Authority offers the following general comments:

- Section 16.1 of the report listed the following guidelines as being considered, including (1) *Managing Land Contamination: Planning Guidelines SEPP 55 – Remediation of Land* (Department of Urban Affairs and Planning and Environment Protection Authority, 1998) and (2) *Guidelines for Consultants Reporting on Contaminated Sites* (Office of Environment and Heritage, 2000). The Environment Protection Authority notes that the Guidelines for Consultants is referenced incorrectly and should read "*Guidelines for Consultants Reporting on Contaminated Sites* (OEH 2011)"
- The proponent must follow further guidance to assess, manage and report potentially contaminated land, beyond the two references listed. Please refer to the current list of guidelines made or approved by the Environment Protection Authority under the *Contaminated Land Management Act 1997* (CLM Act).
- Where any identified contamination meets the triggers contained in the *Guidelines for the Duty to Report*, then the contamination (or site) should be notified to the Environment Protection Authority in accordance with requirements of s60 of the CLM Act.

Response

The referencing error for the Contaminated Sites Register and Record of Notices is acknowledged. The reference to 2015 refers to when this source was searched as part of the original Environmental Impact Statement. For the proposed modification, the Contaminated Sites Register and Record of Notices was again searched in April 2017.

The referencing error *Guidelines for Consultants Reporting on Contaminated Sites* (OEH 2011) is also acknowledged, but does not affect the approach to or outcomes of the assessment.

The two guidelines referenced in Section 16.1 of the modification report relate to the assessment undertaken. All relevant guidelines made or approved by the Environment Protection Authority under the CLM Act would be followed for future assessment, management and reporting to contaminated sites.

Duty to report requirements are noted. Transport for NSW would comply with all applicable legislation.

5.2 Heritage Council of NSW

5.2.1 Victoria Cross Station

Issue raised

The proposed modification results in six local heritage items no longer impacted due to the change in location, one item where impacts would be reduced, and five new local heritage items potentially impacted as a result of the proposed modification. Impacts are generally limited to views and setting with some potential impacts from vibration during construction activities. The main local item potentially affected by vibration is the Shop at 243 Miller Street also known as "Garston" (LEP item).

The range of impacts to the local items at Victoria Cross would be similar under the proposed modification as they were for the approved project. Mitigation measures already required under the approved project would be sufficient to manage any impacts on the local LEP listed items.

Response

The issues raised in the submission are consistent with the findings of the modification report.

Issue raised

The Archaeological Assessment of the revised location is presented in pages 148-149 of the report. The assessment is unclear and in part contradictory. Table 12-5 notes that there may be surviving resources of local significance but has concluded that for resources from the eras pre-1860 and mid to late 19th century that there would be nil to moderate potential for resources to survive. There appears to be an error in Table 12-5 regarding 20th century archaeology where these are stated both to not meet the threshold of local significance and also to be of local significance.

Response

The information in Table 12-5 regarding pre-1860 to mid to late 19th century archaeological resources is considered consistent. It is identified that, were they to be present, pre-1860 archaeological resources would have local significance but it is concluded that the potential for these resources to be present is nil-low.

There is an error in the second column of Table 12-5 in relation to mid-20th century commercial development. The final sentence should read "However, these would **not** reach the threshold of local significance".

Issue raised

It is noted that the existing management measures for the approved project such as construction environmental management plans and relevant sub-plans would continue to apply to the project.

Response

Noted.

5.2.2 Artarmon substation

Issue raised

The proposed modification does not result in impacts to any above ground heritage items as there are no listed LEP items within the area.

The revised site has low potential for archaeology and any surviving archaeology is not likely to meet the threshold for local significance. It is, therefore, considered that there would be no need for any new mitigation measures to manage heritage issues for the Artarmon substation component of the proposed modification.

Response

Noted.

5.3 Department of Primary Industries

Issue raised

The proposal represents a significant change in the groundwater management at Artarmon substation from a tanked design to a drained design. It is noted that page 3 and 78 of the Groundwater Assessment included in the Environmental Impact Statement for the approved project proposed a tanked design for Artarmon substation shaft, which appears to have been incorrectly identified as a drained design in the modification report. It is also unclear whether the groundwater management for Victoria Cross Station is proposed to be changed to a drained design in line with that of Victoria Cross Station shaft. As such, the proponent should confirm whether the modification seeks to change the groundwater management at Victoria Cross Station and Artarmon substation from a tanked design to a drained design, and if so provide:

- An assessment of the specific impacts of each structure under the modified design
- Details on the changes to the volume of groundwater that is likely to be taken
- An assessment of the potential long-term water quality impacts on the groundwater
- Details on how the monitoring and reporting arrangements will be adopted to track the impacts and to meet the water management legislation requirements
- Justification for design changes leading to increased impacts.

Response

The Artarmon substation would be a tanked structure. However, for assessment purposes 'drained' conditions were conservatively assumed for all project elements (refer to Section 4.3 of Technical Paper 7).

Consistent with the Environmental Impact Statement, under the proposed modification the northern shaft at Victoria Cross Station would be drained while the station cavern would be a tanked structure.

5.4 North Sydney Council

Council is generally supportive of the proposal to relocate the Victoria Cross Station services building to 50 McLaren Street, particularly as it facilitates the provision of an additional station access point servicing the northern end of the North Sydney CBD and adjoining precincts. The extension of the metro customer catchment is a positive step in improving access to public transport infrastructure in North Sydney.

The proposal aligns with Council's desire for a northern metro access portal, as identified in its Sydney Metro Planning Study (updated February 2017).

5.4.1 Construction and traffic management

Issue raised

Chapter 7 of the modification report cites an opportunity to more evenly share spoil removal and possibly other excavation / construction activities between the southern station site and the new northern site. It is noted that any decrease in construction activities on the southern site will involve an increase in activities – including truck movements and subsequent impacts on the northern site. It is important to note the existence of sensitive impact receivers adjacent to and nearby the site, particularly residential and educational land uses.

In principle, Council considers that the northern site should not shoulder the burden of construction activities beyond what is commensurate with the proposed northern services and access site construction. For example, a 14 per cent increase in spoil generation for the services and access facility should, in principle, only generate a 14 per cent increase in associated truck movements from the approved EIS.

Notwithstanding the above, Council acknowledges that the utilisation of the northern site may increase the efficiency of the construction process and ultimately contribute to a reduction in the duration of metro works. As such, it is critical that any impacts from increased construction activity at the northern site be appropriately mitigated to minimise impacts on sensitive surrounding land uses, particularly where after-hours works are proposed.

Response

The proposed modification would result in an increase in the number of construction vehicles required and a change in vehicle movement forecasts compared to the approved project. This is due to a 14 per cent increase in spoil generation but also because the larger site allows for a more even distribution of construction vehicle movements between the southern and northern construction sites and provides more opportunity to support station cavern excavation and spoil removal activities.

The difference in construction vehicle movements at the Victoria Cross Station northern construction site between the approved project and that required for the proposed modification is shown in Table 9-4 of the modification report.

The proposed modification would be constructed in accordance with relevant conditions of approval including:

- Condition C2 – Construction Traffic Management Plan
- Conditions E75 to E96 – various traffic and transport conditions including the requirement for the development and implementation of a Construction Traffic Management Framework.

An additional mitigation measure (NV11) has been included in Chapter 7 of this submissions report to investigate opportunities to minimise heavy vehicle movements from the Victoria Cross Station northern construction site at night.

Issue raised

The modification report proposes that trucks exiting the northern construction site will access the Warringah Freeway via Walker Street. It is noted that Walker Street is a local road and is not suitable for larger trucks with trailers. Large truck movements should be confined wherever possible to arterial roads.

Response

The outbound haulage route via McLaren Street and Walker Street was identified as the most efficient means for haulage vehicles to access the arterial road and motorway network. This route provides a balance between minimising the use of local roads and avoiding the need for heavy vehicles to make right-turns out of the construction site and accelerate up the steep grade to the McLaren Street / Miller Street intersection.

Construction traffic routes would be confirmed in consultation with stakeholders during the preparation of the Construction Traffic Management Framework required by Condition E81.

5.4.2 Strategic need and justification

Issue raised

The potential for reduced operational and construction environmental impacts on adjoining land is noted.

Response

Noted.

5.4.3 Stakeholder and community engagement

Issue raised

The May 2017 engagement with surrounding land owners and residents is noted. Council expects that surrounding stakeholders continue to be consulted and informed of all aspects of construction and operational planning. It is also important this this engagement recognise the cumulative potential impacts of other work being conducted in the North Sydney CBD.

Response

As noted in Section 5.5 of the modification report, the project team would continue to consult with the community and key stakeholders during the planning and construction of the project. In general, this consultation would involve:

- Ongoing consultation with key stakeholders, local councils and other government agencies
- Provision of regular updates to commuters and the nearby community
- Development and implementation of a Community Communications Strategy.

Mitigation measure CU1 commits to Transport for NSW managing and co-ordinating the interface with projects under construction at the same time. This would occur in consultation with other government agencies, local councils, emergency service providers, utility providers and construction contractors.

5.4.4 Modification description – operation

Issue raised

Council is supportive of taxi and kiss-and-ride infrastructure being provided at the northern site, away from the CBD core. Although representing a very low expected modal share of all trips, provision of this infrastructure requires careful consideration on likely traffic impacts, particularly on local roads such as McLaren and Walker streets.

The steep gradient of McLaren Street and its impacts on accessibility to this infrastructure needs to also be considered.

Response

Potential impacts associated with taxi and kiss-and-ride facilities, and accessibility, will be considered further as part of the Interchange Access Plans required by Condition E92. Condition E93 requires that specific consideration be given to traffic and accessibility design requirements in developing the Interchange Access Plans.

Issue raised

Council supports the proposed entry plaza to Miller Street. Consideration should be given, however, to an additional eastern access to better connect with nearby schools, hotels, the Ward Street precinct, and a future through site link over 52 McLaren Street. Doing so will also mitigate the constraint posed by the steep gradient of McLaren Street adjacent to the northern access site.

Response

The orientation of the station entrance to Miller Street is preferred for customer access and interchange with bus services. A second eastern entrance is not currently proposed.

The Interchange Access Plan for Victoria Cross Station (required by Condition E92) will inform the final design of transport and access facilities and services, including footpaths, cycleways, passenger facilities, parking, traffic and road changes, and integration of public domain and transport initiatives around and at the station.

Issue raised

Council notes that the existing consent on 50 and 52 McLaren Street requires a pedestrian right-of-way be provided across 52 McLaren Street, between McLaren and Elliot streets. This should form a part of any future development proposal for 52 McLaren Street.

Response

As noted in Section 9.2.2 of the modification report, the connectivity provided by the pedestrian route used by Wenona students that extends from Elliot Street along the eastern boundary of 52 McLaren Street, would be retained during construction (in conjunction with suitable pedestrian management measures along the McLaren Street frontage). An additional mitigation measure (T28) has been included in Chapter 7 of this submissions report to capture this commitment.

The retention of this route during operation would be considered as part of future development proposals for the residual land at 52 McLaren Street and would be subject to separate assessment and approval.

Issue raised

vThe report indicates that the northern services and access building on 50 McLaren Street will be approximately three storeys in height. It is noted that this exceeds the current LEP 2013 height control, but is less than the height of the approved development application currently applying to the site.

Response

Noted.

5.4.5 Modification description – construction

Issue raised

It is noted that Council will have the ability to respond to detailed construction and traffic management plans in due course.

Council notes that only station excavation spoil will be removed from either Victoria Cross construction sites and that tunnel spoil will be extracted elsewhere.

Response

Detailed construction and traffic management plans will be prepared in consultation with Council.

5.4.6 Environmental screening assessment

Issue raised

Council supports the use of acoustic sheds and any other effective noise, dust and other impact mitigation measures on the site.

Response

All these measures are committed to by Transport for NSW.

5.4.7 Noise and vibration

Issue raised

Mitigation of impacts is required under the existing consent as listed in Section 10.3.4 of the modification report.

Response

The mitigation measures identified in Chapter 18 of the modification report, the existing conditions of approval and any additional conditions of approval associated with the proposed modification, would apply to the proposed modification.

5.4.8 Land use and property

Issue raised

The modification report states that 'the airspace above the services building may be used for future development in line with Council's Capacity and Land Use Study'. Council notes that the Study and accompanying planning proposal propose no additional height on both 50 and 52 McLaren Street. 50 McLaren Street, in particular, should not be considered for any built form element above the indicative built form proposed under the modification report.

Response

Any future redevelopment of the site, including any potential over station development, would be subject to a separate planning approval process.

Issue raised

Consideration should be given to wholly non-residential uses on the 52 McLaren Street site, given its excellent access to transport infrastructure and North Sydney's commitment to providing new commercial floor space in the CBD.

Response

The type and form of any future redevelopment of the site at 52 McLaren Street would be subject to ongoing investigation and separate assessment and approval. Transport for NSW will continue to consult with North Sydney Council during any future planning undertaken for this site.

5.4.9 Non-Aboriginal heritage

Issue raised

The modification is likely to pose reduced risk to local heritage. The relocated site, however, lies adjacent to an item of local heritage (243 Miller Street) and needs to be appropriately designed in order to complement the heritage streetscape and local character.

Response

The design of the northern station entrance and services building would be guided by the *Sydney Metro City and Southwest – Design Guidelines*. The latest version of this document can be found at www.sydneymetro.info. Section 3.2.3 of the Design Guidelines includes various guidelines relating to heritage and archaeology and state the following overarching principle:

Ensure elements and items of heritage significance are appropriately managed and respected. Identify opportunities for heritage conservation to contribute to the celebration of local identity in station design.

5.4.10 Landscape character and visual amenity

Issue raised

The modification provides the opportunity to contribute to and enhance the locality through good, sensitive design and appropriate scale.

Response

The design of the northern station entrance and services building would be guided by the *Sydney Metro City and Southwest – Design Guidelines.* The latest version of this document can be found at www.sydneymetro.info. The Guidelines establish the design standards for the project by guiding the design of:

- The interface between stations and their surrounding locality including
  - Station entries
  - Transport interchange facilities (bicycle facilities, bus stops, kiss and ride, taxi ranks and connections to existing rail, ferry and light rail transport)
- Landscaping and other public domain elements
- Rail corridor works including the tunnel dive structures, rail cuttings and embankments
- Station and service buildings, including underground stations.

5.4.11 Biodiversity

Issue raised

Any proposed impacts to vegetation and habitat need to be offset to retain and enhance the locality's biodiversity and streetscape.

Response

The provision of replacement plantings for any trees removed as part of the project would be consistent with the requirements of Condition E6. Decisions regarding the provision of replacement trees would be made in consultation with Council.

5.4.12 Undergrounding of power lines

Issue raised

Undergrounding of power lines needs to be undertaken in conjunction with the metro works. This is essential in delivering an appropriate public domain response to the metro.

Response

Undergrounding of power lines would be considered as part of the detailed design process and part of the Station Design and Precinct Plan for Victoria Cross Station required under Condition E101. The Station Design and Precinct Plan will be developed in collaboration and consultation with relevant stakeholders including North Sydney Council.

5.4.13 Current Council planning policy

Issue raised

Council request a correction to the EIS summary of Council's current planning policy in relation to the North Sydney CBD. It is noted that Council's current policy is reflected by LEP 2013 and DCP 2013, with the Capacity and Land Use Strategy and associated planning proposal adopted for the purposed of public exhibition.

Response

The relevance of the *North Sydney Local Environmental Plan 2013* and the *North Sydney Development Control Plan 2013* is noted in Section 11.1 of the modification report.

The North Sydney City Centre Capacity and Land Use Strategy is referenced in Section 11.1.2 of the modification report. It is acknowledged that the adopted Strategy is the subject of a planning proposal to amend LEP 2013, which will be publicly exhibited subject to agreement by the Department of Planning and Environment.

5.4.14 Future use of 194-196a Miller Street

Issue raised

Council request that 194-196a Miller Street is retained in public ownership and that the site be used to provide essential community infrastructure including education, health, sporting facilities, to meet the existing and future population needs of residents and workers within the District Plan North Region.

Response

While the acquisition of mixed use land at 194 and 196A Miller Street has already occurred, demolition of the buildings on these sites would no longer be required subject to approval of the proposed modification. Transport for NSW will consider divestment or development of these sites separate from the approved project. This will occur in consultation with Council.

5.5 Willoughby City Council

Issue raised

The proposed new location of a substation for the Chatswood to Sydenham component of the Sydney Metro City & Southwest railway in the Artarmon Industrial Area has been assessed with regard to contamination impacts.

The report has highlighted the potential for new area of contamination interest in the vicinity of the proposed site and that *'exposure or disturbance of contaminants during construction of the proposed modification would be consistent with risks identified for the approved project'*.

The measures to address the existing and potential conditions have been addressed in the previously approved project assessment methodology and it is recommended these are carried forward in relation to the new location.

That agreed, it is considered that the proposed site of the substation is acceptable and therefore Council has no additional comments.

Response

Noted. The mitigation measures identified in Chapter 18 of the modification report and the existing conditions of approval would apply to the proposed modification.

COMMUNITY SUBMISSIONS

CHAPTER SIX

6 Community submissions

6.1 Wenona School

In broad terms, Wenona supports the proposed modifications, including the proposed new northern station entry, and is grateful for the consultation and ongoing dialogue with Transport for NSW. Wenona looks forward to continuing to work with Transport for NSW during the construction and detailed design phase of the project to ensure the project does not disrupt the Wenona campus and the school's current building project.

6.1.1 Construction logistics

Issue raised

The modification report describes the land at 50 and 52 McLaren Street as being vacant, however it is currently being used for construction related purposes associated with the development of Wenona's STEM building at 255-265 Walker Street. The use of 50 and 52 McLaren Street for this purpose provides the most optimal means mitigating impacts on neighbouring landowners and occupiers of activity associated with the STEM building construction. This building is expected to be completed at the end of 2018 which means there is a potential overlap in 2018, and potentially earlier if enabling works are required on the site.

Wenona has had productive discussions with Transport for NSW regarding the potential programming and rearrangement of activities to facilitate the two construction projects and is hopeful that this can be achieved in the final Construction Management Plan and Construction Traffic Management Plan.

Response

Transport for NSW will continue to consult Wenona School regarding the use of the land at 50 and 52 McLaren Street. This will include consideration of the potential overlap of construction activities.

6.1.2 Traffic impacts

Issue raised

The modification report identifies that the indicative construction traffic arrangements involve vehicles approaching the site travelling south on Miller Street to enter left-in via McLaren Street and exit left-out on McLaren Street to join Walker Street and the Warringah Freeway in a south-bound direction. Restricted traffic movements may be made right-out from McLaren Street heading towards the Pacific Highway outside of school set-down and pick-up times. There are substantially more vehicle movements expected because of the northern station entrance being used to share spoil disposal with the southern station entrance. Most vehicle movements are proposed between 10am to 3pm and 7pm to 6am (24 vehicle movements per hour compared to 6 movements per hour at other times). Finally, the modification report notes that "Secondary access and egress may also be established to the north of 50 and 52 McLaren Street from Elliott Street but would be restricted to special deliveries".

We generally support the indicative construction traffic arrangements; however, the following observations are made for inclusion in the Construction Traffic Management Plan:

- It is essential that no construction traffic should use Walker Street north of McLaren Street or Ridge Street (include trucks in empty circulation). These streets are used heavily by pedestrians.
- Secondary access from Elliot Street should not be permitted because of the potential conflict with students and other users of Elliot Street including the Rydges Hotel
- Peak hour vehicle movements should be minimised, as currently proposed.

Response

The high levels of pedestrian movement on the northern section of Walker Street and on Ridge Street are noted. The section of Walker Street north of McLaren Street, and Ridge Street, would not be used by construction vehicles using the proposed primary haulage route.

In accordance with mitigation measure T14, construction site traffic immediately around construction sites would be managed to minimise movements through school zones during pick up and drop off times. In addition, mitigation measure T13 requires that construction site traffic be managed to minimise movements in the AM and PM peak periods.

Arrangements for the management of construction traffic would be confirmed in consultation with relevant stakeholders during the preparation of the Construction Traffic Management Framework and associated Construction Traffic Management Plans required by Conditions E81 and E82 respectively.

6.1.3 Impact on general purpose learning area

Issue raised

Wenona has a single multi-function assembly, education and sports facility, which is located within the main building on Miller Street. It adjoins the rear of 52 McLaren Street which is proposed to be used for a variety of low-impact purposes including staff amenities and a staff office.

Although this building is used for boisterous activities including sport, it is also used for more solemn activities including services and assemblies.

It is important that the final Construction Management Plan is cognisant of this facility when determining the final use of 52 McLaren Street during the construction phase.

Response

Further consultation with Wenona School will occur during detailed construction planning regarding the establishment and operation of construction support activities at 52 McLaren Street. This will include identifying opportunities to minimise noise during periods where the Wenona School multi-function building is being used for noise sensitive activities. The outcomes of consultation will be reflected in the Construction Noise and Vibration Management Sub Plan required by Condition C3 or the detailed site specific Construction Noise and Vibration Impact Statements required by Condition E33.

6.1.4 Future over station development

Issue raised

While it is appreciated that the future development of 52 McLaren Street will be the subject of a separate approval, Wenona wishes to express its desire to ensure that the ultimate development of this land provides pedestrian connectivity from north to south and is of an appropriate scale given its immediate context.

Response

As noted in Section 9.2.2 of the modification report, the connectivity provided by the pedestrian route used by Wenona students that extends from Elliot Street along the eastern boundary of 52 McLaren Street, would be retained during construction (in conjunction with suitable pedestrian management measures along the McLaren Street frontage). An additional mitigation measure (T28) has been included in Chapter 7 of this submissions report to capture this commitment.

The retention of this route during operation would be considered as part of future development proposals for the residual land at 52 McLaren Street and would be subject to separate assessment and approval.

6.2 Monte Sant' Angelo Mercy College

6.2.1 Support for the proposed Victoria Cross Station modification

Issue raised

Monte Sant' Angelo Mercy College support the relocated Victoria Cross Station northern services building due to the following benefits:

- Reduced construction impacts compared to the previous site including:
  - As the site is currently vacant the building demolition process would be avoided resulting in lower levels of disruption to existing and adjacent owners and occupiers
  - The proposal would not affect the level of service at nearby intersections and will have fewer impacts on public transport (such as bus stops) and the active transport network
  - The site is a corner site with two road frontages, which enhances flexibility and accessibility for construction purposes
- The proposed site location would result in overall lower level exceedances of airborne and ground borne noise management levels. As such it represents as a far superior solution from an acoustic amenity perspective.
- Improved public benefit outcomes through the northern station entry including:
  - Improve amenity and access for customers including the Monte Sant' Angelo Mercy College community
  - Increase the reach of the station catchment to include additional regional attractors such as the Mater Hospital, North Sydney Oval, North Sydney Boys High School and the residential and mixed use area to Falcon Street
  - Benefits to customers using local bus services on Miller Street by providing an alternative and improved transfer opportunity.

Response

Noted.

6.3 Garston Pty Ltd

6.3.1 Land use and access

Issue raised

243 Miller Street has been incorrectly referred to as a "Shop" in the modification report. This property is a tenanted house and cottage, and is predominantly residential, with a very small proportion of commercial tenants.

Response

It is acknowledged that 243 Miller Street includes a tenanted house and cottage, with a commercial component. For the purposes of assessment, both uses were assumed.

The property is referred to as a 'Shop' in the *North Sydney Local Environmental Plan 2013* heritage listing for the site. This is noted in Chapter 12 (Non-Aboriginal heritage) of the modification report.

Issue raised

Prior to the commencement of any excavation works on the 50 McLaren Street site, we would need to see a satisfactory resolution to the guaranteed continued access for our disabled granddaughter to McLaren / Miller Street in accordance with our Licence Agreement with The Uniting Church (the present owners of the site) and Transport for NSW (the future owners of the site).

Response

Access to 243 Miller Street would be maintained during construction. Consistent with the requirements of mitigation measure T8, further consultation with Garston Pty Ltd regarding access would occur prior to the commencement of construction. Transport for NSW is committed to maintaining continued access for the occupants of 243 Miller Street.

6.3.2 Setbacks

Issue raised

Concern is raised regarding the proximity of the services building to the southern boundary of our property. The setback to our boundary should be contained within the DA footprint previously approved for the Uniting Church development (DA 67/11).

Response

The development proposed by DA 67/11 included a 3.0 metre setback to the northern boundary (the southern boundary of 243 Miller Street) for the basement levels and a six metre setback for the lower ground and ground levels.

The functional requirements of the proposed station entry and services building mean that equivalent setbacks to those proposed by DA 67/11 cannot be achieved. A setback of about 3.3metres to the northern boundary is proposed consistent with the prescribed setback in clause P6 of the *North Sydney Development Control Plan 2013*.

6.3.3 Impacts on trees

Issue raised

The mature native trees growing on our property should be guaranteed protection in respect of any development taking place on the 50 McLaren Street site. Transport for NSW should restrict their building activities by observing the root protection zone previously adopted by North Sydney Council.

Response

Transport for NSW will implement measures to protect trees on 243 Miller Street and also now proposes an increased setback of about 3.3 metres to the boundary with this property. While there is expected to be some encroachment into the tree protection zone and structural root zone for these trees established in accordance with AS 4970-2009 – Protection of trees on development sites, inspection by a qualified arborist has indicated that the majority of the roots are likely to be located to the north due to the presence of the rock wall on the southern side. While impacts on these trees are not expected, further investigation to confirm this through digging or the use of ground penetrating radar is not possible at this time due to the presence of fibrous roots from palm trees that were previously planted at this location. Initial excavation works would therefore occur under the supervision of an arborist.

6.3.4 Construction noise

Issue raised

Concern about noise levels during the construction phase. Predicted truck movements of 24 vehicles per hour during the hours of 7pm to 6am is simply not acceptable and should be reconsidered for what is predominantly a residential zone with sensitive receivers located not only at 243 Miller Street but also at 237 Miller Street and 39 McLaren Street and lower down McLaren Street.

Response

Section 10.3.3 of the modification report identifies that on McLaren Street and Miller Street the base road traffic noise criteria are expected to be exceeded and the predicted noise level increase (L_{Aeq}) at night associated with construction traffic is expected to be greater than 2 dB (up to 2.5 dB on McLaren Street). While the increase above the 2 dB allowance is small, sensitive receivers may notice an increase in the average road traffic noise levels during construction. A similar outcome is expected for Walker Street.

There are expected to be up to 24 heavy vehicle and 10 light vehicle movements or events per hour during the night (in contrast with six heavy vehicle and no light vehicle movements at the northern site for the approved project). This would result in an exceedance of the sleep disturbance screening criterion (of up to 13 dB) and external sleep disturbance NML of 65 dBA (by up to 14 dB).

Where compliance with the road traffic noise criteria cannot be achieved, alternative routes, for night time heavy vehicle movements, such as the restricted route shown on Figure 7-1 of the modification report, would be investigated. This would include consideration of the number of affected sensitive receivers, traffic impacts and uphill steep grades which can contribute to increased engine noise from construction vehicles.

An additional mitigation measure (NV11) has been included in Chapter 7 of this submissions report to investigate opportunities to minimise heavy vehicle movements from the Victoria Cross Station northern construction site at night.

Arrangements for the management of construction traffic would be confirmed in consultation with relevant stakeholders during the preparation of the Construction Traffic Management Framework and associated Construction Traffic Management Plans required by Conditions E81 and E82 respectively.

6.3.5 Construction vibration and dust

Issue raised

Concern was expressed about vibration and dust impacts on the 243 Miller Street property during the construction phase considering this is a significant heritage item of Arts & Crafts style. A dilapidation report may be required for this property.

Response

Consistent with the requirements of mitigation measure NV3, a more detailed assessment of structures at 243 Miller Street would be conducted and attended vibration monitoring would be carried out to ensure vibration levels remain below appropriate limits for these structures.

Pre-construction and post-construction building condition surveys would be offered to the owners of 243 Miller Street consistent with the requirements of Conditions E59 and E60.

Dust impact during construction would be adequately managed through the implementation of mitigation measures AQ4 to AQ9.

6.3.6 Operational noise and light

Issue raised

Concerns raised regarding light and noise impact on 243 Miller Street once the Victoria Cross Station northern entry is operational, including the likely impact after peak hour and overnight.

Response

Section 14.2.2 of the modification report identifies that there would be negligible night-time visual impacts at the proposed modification site during both construction and operation. The lighting associated with the station entry and services building at this location would generally be in character with the existing lighting levels of the area. The night-time landscape was assessed as being 'E4: High district brightness' in accordance with *Guidance for the reduction of obtrusive light* (Institution of Lighting Engineers (UK), 2005).

The Station Design and Precinct Plan required by Condition E101 will address the location, design and impacts of operational lighting and measures proposed to minimise lighting impact. In addition, Condition E104 requires that all permanent external lighting must be the minimum level of illumination necessary and must comply with AS: 4282:1997 – *Control of the Obtrusive Effects of Outdoor Lighting* and relevant Australian Standards in the series AS/NZ 1158 – *Lighting for Roads and Public Spaces*.

In relation to operational noise, the design of station mechanical and electrical services for the proposed modification site is yet to be finalised and plant and equipment selection is subject to change. Notwithstanding, a maximum allowable mechanical and electrical services sound power level of 80 dBA has been calculated for the purpose of detailed design of the proposed modification site.

It is expected that the external noise criterion of 56 dBA (determined in accordance with the *Industrial Noise Policy* (EPA, 2000)) can be achieved through the use of appropriate noise attenuation measures such as equipment selection, positioning of plant and ventilation discharges, in-duct attenuators, and acoustic enclosures.

6.4 Strata Plan SP56005

6.4.1 Construction noise

Issue raised

The area is residential and as such request that night truck movements be restricted.

Response

There are expected to be up to 24 heavy vehicle and 10 light vehicle movements or events per hour during the night (in contrast with 6 heavy vehicle and no light vehicle movements at the northern site for the approved project). This would result in an exceedance of the sleep disturbance screening criterion (of up to 13 dB) and external sleep disturbance NML of 65 dBA (by up to 14 dB).

Where compliance with the road traffic noise criteria cannot be achieved, alternative routes, for night time heavy vehicle movements, such as the restricted route shown on Figure 7-1 of the modification report, would be investigated. This would include consideration of the number of affected sensitive receivers, traffic impacts and uphill steep grades which can contribute to increased engine noise from construction vehicles.

An additional mitigation measure (NV11) has been included in Chapter 7 of this submissions report to investigate opportunities to minimise heavy vehicle movements from the Victoria Cross Station northern construction site at night.

Arrangements for the management of construction traffic would be confirmed in consultation with relevant stakeholders during the preparation of the Construction Traffic Management Framework and associated Construction Traffic Management Plans required by Conditions E81 and E82 respectively.

6.4.2 Building impacts

Issue raised

The pedestrian access from the base of the lift shaft could be too close to the basement of our building which is approximately 22 metres below natural ground level.

Response

The top of the combined pedestrian and services adit is at a depth of about 32 metres below the level of Miller Street. This provides sufficient separation from the basement of the subject building.

6.4.3 Future development

Issue raised

A three storey station service building is proposed. What constraints are there in place with regard to development of the airspace above the station services building?

Response

The modification proposal is confined to the three story station entry and services building. Any future redevelopment of the site, including any potential over station development, would be subject to a separate planning approval process.

Issue raised

What are the plans for the 52 McLaren Street site after construction is completed?

Response

The type and form of any future redevelopment of the residual land at 52 McLaren Street is still being investigated and would be subject to a separate assessment and approval process.

6.5 Individual

6.5.1 Consultation

Issue raised

Concern was raised about the consultation / notification process noting that they were not notified about the proposed modification as an affected non-resident property owner.

Response

Chapter 3 of this submissions report provides a summary of the consultation activities that have occurred for the proposed modification. Additional forms of consultation / notification will be considered for any future applications and this may include direct notification of strata property owners.

6.5.2 Construction noise

Issue raised

The assessment for the Victoria Cross station entry and services building does not account for the actual number of individual apartments adversely affected because it treats apartment buildings as single residential receivers.

Response

It is common for receivers to be grouped into catchment areas for construction noise during an environmental assessment. A Noise Catchment Area (NCA) provides a logical grouping of receivers affected by the same works to assist with assessment, consultation or notification. While as part of this process each building within an NCA is typically considered as a single receiver, it is acknowledged that multi-storey apartment buildings include many potentially affected households.

Chapter 10 (Noise and vibration) of the modification report notes that the proposed modification would result in lower level exceedances of NMLs for airborne noise when compared to the approved project site. It is acknowledged that due to the change in location, these lower levels would affect different receivers and potentially different numbers of receivers.

Issue raised

The existing background noise levels were recorded in Miller Street (not McLaren Street) outside The Harvard. This location is significantly noisier than the McLaren Street frontage of The Harvard, due to significantly more traffic, and consequently the NMLs that have been used in the modification report to assess noise impacts on the apartments closest to the development site are wrong.

Response

All of the potentially most affected residential receivers are within 160 metres of the noise monitoring position and the results were free from anomalies. The results are therefore considered to be suitable for the setting of construction NMLs at this stage of assessment. Further monitoring would be conducted at a receiver addressing McLaren Street during the preparation of the Construction Noise and Vibration Management Plan to confirm the applicable NMLs. An additional mitigation measure (NV10) has been included in Chapter 7 of this submissions report to capture this commitment.

Issue

The approved site would have generated less than one truck per hour at night in McLaren Street, but the modification proposes 24 heavy trucks per hour throughout the night in McLaren Street. Predicted night-time construction traffic noise levels are greater than for the approved site, substantially exceed applicable criteria and are therefore not acceptable.

The NML noise criteria specified in the modification report must not be exceeded at any time. No trucking disposal of soil should be allowed outside normal daytime hours (7am-6pm Monday to Friday, 8am-1pm Saturday).

Response

Where compliance with the road traffic noise criteria cannot be achieved, alternative routes, for night time heavy vehicle movements, such as the restricted route shown on Figure 7-1 of the modification report, would be investigated. This would include consideration of the number of affected sensitive receivers, traffic impacts and uphill steep grades which can contribute to increased engine noise from construction vehicles.

An additional mitigation measure (NV11) has been included in Chapter 7 of this submissions report to investigate opportunities to minimise heavy vehicle movements from the Victoria Cross Station northern construction site at night.

Arrangements for the management of construction traffic would be confirmed in consultation with relevant stakeholders during the preparation of the Construction Traffic Management Framework and associated Construction Traffic Management Plans required by Conditions E81 and E82 respectively.

Issue

The assessment does not consider activities which are likely to occur outside of the proposed acoustic shed such as spoil stockpiling machines and truck movements. An acoustic shed should cover all construction, excavation, stockpiling, earth moving and truck activities on both 50 and 52 McLaren Street.

Response

The indicative site layout shown in Figure 7-1 of the modification report indicates that most activities would occur within or behind the acoustic shed, once it is constructed. There would be no aboveground construction works undertaken external to the acoustic shed outside of standard construction hours, with the exception of those activities requiring temporary possession of the road network.

Issue

The use of 'medium' rock-breakers is predicted to have a noise level of 60 dB at the façade of The Harvard. This exceeds the daytime noise criteria level of 45 dBA by 15 dBA.

No prediction is made of evening or night-time levels, as they are shown to be 'n/a', but a rock-breaker noise of 60 dBA would be 20 dBA in excess of the evening criteria and 25 dBA in excess of the night-time criteria if they were allowed to operate.

Despite the assessment showing the evening and night-time noise to be 'n/a', the modification report gives no commitment that rock-breakers will not be used in evenings or at night.

No rock-breakers should be allowed at any time.

Response

The two methods of excavation assessed were:

- Excavation using rockbreakers
- Excavation using drill and blast (with non-percussive rock drills required for drilling blast charge holes).

The predicted ground-borne noise levels and NML exceedances for these two excavation methods are presented Chapter 2 (Modification Report clarifications) (Table 2-1) of this submissions report. The designation 'n/a' is used against rockbreaking in the evening and night-time periods because that activity is not proposed to occur at those times.

Initial excavation at the proposed modification site is expected to involve the use of rock hammers and excavators until appropriate offset depths are reached in order to achieve compliance with the relevant blasting criteria. Based on the anticipated ground conditions, the depth at which blasting could commence at the site is anticipated to be around 15 metres.

Mitigation measure NV7 commits to investigating and implementing alternative demolition techniques that minimise noise and vibration levels where feasible and reasonable. This would include consideration of:

- The use of hydraulic concrete shears in lieu of hammers/rock breakers
- Sequencing works to shield noise sensitive receivers by retaining building wall elements
- Locating demolition load out areas away from the nearby noise sensitive receivers
- Providing respite periods for noise intensive works
- Methods to minimise structural-borne noise to adjacent buildings including separating the structural connection prior to demolition through saw-cutting and propping, using hand held splitters and pulverisers or hand demolition

- Installing sound barrier screening to scaffolding facing noise sensitive neighbours
- Modifying demolition works sequencing / hours to minimise impacts during peak pedestrian times and / or adjoining neighbour outdoor activity periods.

Additionally, Conditions E37 through E40 set out requirements for respite periods to address construction noise (including ground-borne noise).

6.5.3 Operational noise

Issue

Electrical sub-station, vent fans, lifts and draft relief vents will generate noise, and the modification report proposes a maximum allowable sound power level of 80 dBA for design purposes. However, despite these electrical and mechanical devices having the power level to cause potential noise disturbance to residents of The Harvard, especially those with bedrooms on the northern side of The Harvard, the report omits to provide any prediction of operational noise levels at the façade of the building.

Response

The maximum allowable sound power levels emitted by industrial-type noise sources were predicted for each location in order to meet the amenity and intrusive noise criteria at nearby sensitive receivers. For Victoria Cross, the calculated maximum sound power level for these industrial-type noise sources was 80 dBA. This level was compared to plant and equipment selections associated with the Epping to Chatswood Rail Line project to determine the feasibility of achieving the applicable noise criteria.

It is expected that measures including appropriate equipment selection, in-duct attenuators, acoustic enclosures and the strategic positioning of critical plant and vent discharges away from sensitive receivers will be needed to meet the applicable criteria.

REVISED ENVIRONMENTAL MITIGATION MEASURES

CHAPTER SEVEN

7 Revised environmental mitigation measures

The list of mitigation measures presented in Chapter 18 of the modification report has been revised based on the submissions received.

Table 7-1 provides the revised consolidated environmental mitigation measures. This table supersedes the mitigation measures presented in the modification reports for Victoria Cross and Artarmon Substation, Central Walk, Martin Place Station and Sydenham Station and Sydney Metro Trains Facility South. New mitigation measures or additions to existing mitigation measures are shown in **bold** text, with deletions shown with a ~~strikethrough~~. This table assumes that the Central Walk, Martin Place Station and Sydenham Station and Sydney Metro Trains Facility South modifications are approved without changes.

As per the approach for the approved project, the location(s) applicable to each mitigation measure are identified by using a unique identifier as follows:

- STW – Surface track works
- CDS – Chatswood dive site
- AS – Artarmon substation
- CN – Crows Nest Station
- VC – Victoria Cross Station
- BP – Blues Point temporary site
- GI – Ground improvement works
- BN – Barangaroo Station
- MP – Martin Place Station
- PS – Pitt Street Station
- CS – Central Station
- WS – Waterloo Station
- MDS – Marrickville dive site (this area also includes the necessary mitigation measures for the Sydney Metro Trains Facility South)
- SS – Sydenham Station
- STWS – Surface track works south
- Metro rail tunnels – Metro rail tunnels not related to other sites (eg TBM works)
- PSR – Power supply routes.

Table 7-1 Revised environmental mitigation measures

ID	Mitigation measure	Applicable location(s)[1]
Construction traffic and transport		
T1	Ongoing consultation would be carried out with (as relevant to the location) the CBD Coordination Office, Roads and Maritime Services, Sydney Trains, NSW Trains, the Port Authority of NSW, Barangaroo Delivery Authority, local councils, emergency services and bus operators in order to minimise traffic and transport impacts during construction.	All except metro rail tunnels
T2	Road Safety Audits would be carried out at each construction site. Audits would address vehicular access and egress, and pedestrian, cyclist and public transport safety.	All except metro rail tunnels
T3	Directional signage and line marking would be used to direct and guide drivers and pedestrians past construction sites and on the surrounding network. This would be supplemented by Variable Message Signs to advise drivers of potential delays, traffic diversions, speed restrictions, or alternate routes.	All except metro rail tunnels
T4	In the event of a traffic related incident, co-ordination would be carried out with the CBD Coordination Office and / or the Transport Management Centre's Operations Manager.	All except metro rail tunnels
T5	The community would be notified in advance of proposed road and pedestrian network changes through media channels and other appropriate forms of community liaison.	All except metro rail tunnels
T6	Vehicle access to and from construction sites would be managed to ensure pedestrian, cyclist and motorist safety. Depending on the location, this may require manual supervision, physical barriers, temporary traffic signals and modifications to existing signals or, on occasions, police presence.	All except metro rail tunnels
T7	Additional enhancements for pedestrian, cyclist and motorist safety in the vicinity of the construction sites would be implemented during construction. This would include measures such as: • Use of speed awareness signs in conjunction with variable message signs near construction sites to provide alerts to drivers • Community educational events that allow pedestrians, cyclists or motorists to sit in trucks and understand the visibility restrictions of truck drivers, and for truck drivers to understand the visibility from a bicycle; and a campaign to engage with local schools to educate children about road safety and to encourage visual contact with drivers to ensure they are aware of the presence of children • Specific construction driver training to understand route constraints, expectations, safety issues, human error and its relationship with fitness for work and chain of responsibility duties, and to limit the use of compression braking • Use of In Vehicle Monitoring Systems (telematics) to monitor vehicle location and driver behavior • Safety devices on construction vehicles that warn drivers of the presence of a vulnerable road user located in the vehicles' blind spots and warn the vulnerable road user that a vehicle is about to turn.	All except metro rail tunnels
T8	Access to existing properties and buildings would be maintained in consultation with property owners.	All except metro rail tunnels
T9	All trucks would enter and exit construction sites in a forward gear, where feasible and reasonable.	All except metro rail tunnels

ID	Mitigation measure	Applicable location(s)[1]
T10	Any relocation of bus stops would be carried out by Transport for NSW in consultation with Roads and Maritime Services, the CBD Coordination Office (for relevant locations), the relevant local council and bus operators. Wayfinding and customer information would be provided to notify customers of relocated bus stops.	All except metro rail tunnels
T11	For special events that require specific traffic measures, those measures would be developed in consultation the CBD Coordination Office (for relevant locations), Roads and Maritime Services, Barangaroo Delivery Authority (for relevant locations) and the organisers of the event.	BN, MP, PS, CS
T12	Construction sites would be managed to minimise construction staff parking on surrounding streets. The following measures would be implemented: • Encouraging staff to use public or active transport • Encouraging ride sharing • Provision of alternative parking locations and shuttle bus transfers where feasible and reasonable. Transport for NSW would work with local councils to minimise adverse impacts of construction on parking and other kerbside use in local streets, such as loading zones, bus zones, taxi zones and coach zones.	All except metro rail tunnels
T13	Construction site traffic would be managed to minimise movements in the AM and PM peak periods.	All except metro rail tunnels
T14	Construction site traffic immediately around construction sites would be managed to minimise movements through school zones during pick up and drop off times.	All except metro rail tunnels
T15	Pedestrian and cyclist access would be maintained at Crows Nest during the temporary closure of Hume Street, and at Martin Place during the temporary partial closure of Martin Place. Wayfinding and customer information would be provided to guide pedestrians and cyclists to alternative routes.	CN, MP
T16	Timing for the temporary closure of the Devonshire Street tunnel would avoid periods of peak pedestrian demand. Wayfinding and customer information would be provided to guide pedestrians to alternative routes.	CS
T17	Consultation would occur with the Harbour Master, Roads and Maritime Services and Sydney Ferries' to ensure shipping channels are maintained during the Sydney Harbour ground improvement works.	GI
T18	During the closure of existing entrances to Martin Place Station, marshalls would be provided during the AM and PM peak periods to direct customers to available access and egress points.	MP
T19	Where existing parking is removed to facilitate construction activities, alternative parking facilities would be provided where feasible and reasonable.	All except metro rail tunnels
T20	Alternative pedestrian routes and property access would be provided where these are affected during the construction of the power supply routes.	PSR
T21	The potential combined impact of trucks from multiple construction sites would be further considered during the development of Construction Traffic Management Plans.	All except metro rail tunnels

ID	Mitigation measure	Applicable location(s)[1]
T22	Where existing footpath routes used by pedestrians and / or cyclists are affected by construction, a condition survey would be carried out to confirm they are suitable for use (eg suitably paved and lit), with any necessary modifications to be carried out in consultation with the relevant local council.	All except metro rail tunnels
T23	Specific station management measures would be implemented during pedestrian movement Phase 2. This would include strategies such as encouraging passengers to exit platforms at the closest stair case or escalator, signage and marshalling of passengers waiting to board to minimise those waiting adjacent to hoarding and to direct passengers so that that there is even distribution along the platform.	CS
T24	The temporary closures of footpaths on Chalmers Street would not occur at the same time as the temporary closure of the Devonshire Street Tunnel.	CS
T25	During the closure of Randle Lane, traffic control would be provided at either end. Reversing movements out of Randle Lane onto Elizabeth Street would not be carried out during the peak periods of 7 am to 10 am and 3 pm to 7 pm.	CS
T26	During the closure of Randle Lane, access to basement car parking would be maintained where feasible and reasonable. If access cannot be maintained, alternative parking would be arranged.	CS
TT27	Detailed construction planning would be coordinated with the Sydenham to Bankstown project and the Temporary Transport Strategy arrangements to minimise impacts on the traffic and transport network.	SS
T28	**The connectivity provided by the pedestrian route that extends from Elliot Street along the eastern boundary of 52 McLaren Street to McLaren Street would be retained during construction (in conjunction with suitable pedestrian management measures along the McLaren Street frontage).**	**VC**
Operational traffic and transport		
OpT1	Enhancement of pedestrian infrastructure in the vicinity of Victoria Cross and Martin Place stations would be investigated further in consultation with (as relevant to the location) the CBD Coordination Office, Roads and Maritime Services and the relevant local council.	VC, MP
OpT2	Access would be maintained to neighbouring properties.	All except metro rail tunnels
OpT3	The design of the interface between the Frank Channon Walk extension and the signalised intersection at Mowbray Road / Hampden Road (including any shared zone proposal) would be developed in consultation with Roads and Maritime Services and Willoughby Council.	CDS
OpT4	Transport for NSW would work with local councils to minimise adverse impacts of operation on parking and other kerbside use in local streets, such as loading zones, bus zones, taxi zones and coach zones.	All except metro rail tunnels
OpT5	During detailed design, Transport for NSW would consult with Inner West Council, Roads and Maritime Services and other stakeholder on strategies to reduce the number of staged pedestrian marked foot crossings at the Edinburgh Road / Edgeware Road intersection.	MDS
OpT6	Transport for NSW would work with the Inner West Council to facilitate staged completion of relevant sections of the proposed active transport corridor between Sydenham and Bankstown subject to funding.	SS
OpT7	Transport for NSW would work with the Inner West Council to complete a parking study to manage the long term impacts of parking loss around Sydenham Station.	SS

ID	Mitigation measure	Applicable location(s)[1]
Construction noise and vibration		
NV1	The Construction Noise and Vibration Strategy would be implemented with the aim of achieving the noise management levels where feasible and reasonable. This would include the following example standard mitigation measures where feasible and reasonable: • Provision of noise barriers around each construction site • Provision of acoustic sheds at Chatswood dive site, Crows Nest, Victoria Cross, Barangaroo, Martin Place, Pitt Street, Waterloo and Marrickville dive site • The coincidence of noisy plant working simultaneously close together would be avoided • Offset distances between noisy plant and sensitive receivers would be increased • Residential grade mufflers would be fitted to all mobile plant • Dampened rock hammers would be used • Non-tonal reversing alarms would be fitted to all permanent mobile plant • High noise generating activities would be scheduled for less sensitive period considering the nearby receivers • The layout of construction sites would consider opportunities to shield receivers from noise. This would also include carrying out the requirements in relation to construction noise and vibration monitoring.	All
NV2	Unless compliance with the relevant traffic noise criteria can be achieved, night time heavy vehicle movements at the Chatswood dive site, Crows Nest Station, Victoria Cross Station **(southern)** and Waterloo Station sites would be restricted to: • The Pacific Highway and Mowbray Road at the Chatswood dive site • The Pacific Highway, Hume Street and Oxley Street at the Crows Nest Station construction site • McLaren Street, Miller Street and Berry Street at the Victoria Cross Station **southern** construction site • Botany Road and Raglan Street at the Waterloo Station construction site.	CDS, CN, VC, WS
NV3	Where vibration levels are predicted to exceed the screening criteria, a more detailed assessment of the structure and attended vibration monitoring would be carried out to ensure vibration levels remain below appropriate limits for that structure. For heritage items, the more detailed assessment would specifically consider the heritage values of the structure in consultation with a heritage specialist to ensure sensitive heritage fabric is adequately monitored and managed.	All except metro rail tunnels
NV4	Feasible and reasonable measures would be implemented to minimise ground borne noise where exceedences are predicted.	All
NV5	Feasible and reasonable mitigation measures would be implemented where power supply works would result in elevated noise levels at receivers. This would include: • Carrying out works during the daytime period when in the vicinity of residential receivers • Where out of hours works are required, scheduling the noisiest activities to occur in the evening period (up to 10 pm) • Use of portable noise barriers around particularly noisy equipment such as concrete saws.	PSR

ID	Mitigation measure	Applicable location(s)[1]
NV6	Transport for NSW would engage an Independent Acoustic Advisor to act independently of the design and construction teams and provide oversight of construction methods, construction noise and vibration planning, management and mitigation, and construction noise and vibration monitoring and reporting. The key responsibilities of the Independent Acoustic Advisor would include: • Assurance of contractor noise and vibration planning, modelling, management and monitoring practices • Verification of compliance with relevant guidelines and approval requirements • Audit noise and vibration management practices.	All
NV7	Alternative demolition techniques that minimise noise and vibration levels would be investigated and implemented where feasible and reasonable. This would include consideration of: • The use of hydraulic concrete shears in lieu of hammers/rock breakers • Sequencing works to shield noise sensitive receivers by retaining building wall elements • Locating demolition load out areas away from the nearby noise sensitive receivers • Providing respite periods for noise intensive works • Methods to minimise structural-borne noise to adjacent buildings including separating the structural connection prior to demolition through saw-cutting and propping, using hand held splitters and pulverisers or hand demolition • Installing sound barrier screening to scaffolding facing noise sensitive neighbours • Modifying demolition works sequencing / hours to minimise impacts during peak pedestrian times and / or adjoining neighbour outdoor activity periods.	All except metro rail tunnels
NV8	Opportunities to minimise heavy vehicles movements on Randle Lane at night would be further investigated during detailed construction planning.	CS
NV9	Measures would be implemented to reduce work health and safety noise exposure for station workers, retail staff and members of the public within Central Station. These would include: • The use of hoarding and / or temporary noise barriers around construction sites • Providing hearing protection to station staff employees where appropriate • Providing specific work health and safety noise training to commercial receiver employers including guidance on managing their employees during highly noisy periods • The use of signage around construction sites to inform the general public of high noise exposure areas.	CS
NV10	**Further background monitoring would be conducted at a receiver addressing McLaren Street during the preparation of the Construction Noise and Vibration Impact Statements to confirm the applicable noise management levels for construction.**	**VC**
NV11	**Opportunities to minimise heavy vehicle movements from the Victoria Cross Station northern construction site at night would be further investigated during detailed construction planning.**	**VC**

ID	Mitigation measure	Applicable location(s)[1]
Operational noise and vibration		
OpNV1	The height and extent of noise barriers adjacent to the northern and southern surface track works would be confirmed during detailed design with the aim of not exceeding trigger levels from the *Rail Infrastructure Noise Guidelines* (Environment Protection Authority, 2013). At property treatments would be offered where there are residual exceedances of the trigger levels.	STW, STWS
OpNV2	Track form would be confirmed during the detailed design process in order to meet the relevant ground-borne noise and vibration criteria from the *Rail Infrastructure Noise Guidelines* (EPA, 2013) and the *Interim Guideline for the Assessment of Noise from Rail Infrastructure Projects* (DECC, 2007a).	Metro rail tunnels
OpNV3	Stations and ancillary facilities including train breakout noise from draught relief shafts would be designed to meet the applicable noise criteria derived from the *Industrial Noise Policy* (EPA, 2000).	All except metro rail tunnels
OpNV4	Procedural mitigation measures would be implemented to minimise noise emissions from the Sydney Metro Trains Facility South with the aim of meeting the relevant criteria derived from the *Industrial Noise Policy* (Environment Protection Authority, 2000). This would consider measures such as: • Minimising the number of trains being cleaned simultaneously • Cleaning trains without air conditions systems in use • Limit cleaning and start-up operations during the night-time and early morning periods to the trains stabled furthest from the most affected residences. In the event that procedural measures are not sufficient to achieve compliance with the criteria derived from the *Industrial Noise Policy*, at-property treatments would be offered to affected receivers.	MDS
OpNV5	Further detailed investigations would be undertaken of the phased operations once the detail of these changes are determined. This investigation would include determination of the likely change in noise levels at receivers and consideration of the need for any feasible and reasonable mitigation measures taking into consideration the likely duration of the phased operations.	STWS
Land use and property		
LP1	Opportunities to integrate the eastern entry with local strategic planning initiatives would be investigated in consultation with City of Sydney Council.	CS
Business impacts		
BI1	Specific consultation would be carried out with businesses potentially impacted during construction. Consultation would aim to identify and develop measures to manage the specific construction impacts for individual businesses.	All
BI2	A business impact risk register would be developed to identify, rate and manage the specific construction impacts for individual businesses.	All
BI3	Appropriate signage would be provided around construction sites to provide visibility to retained businesses.	All except metro rail tunnels

ID	Mitigation measure	Applicable location(s)[1]
Non-Aboriginal heritage		
NAH1	Archival recording and reporting of the following heritage items would be carried out in accordance with the NSW Heritage Office's *How to Prepare Archival Records of Heritage Items* (1998a), and *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006): • The internal heritage fabric and any non-original elements removed from within the curtilage of Mowbray House, Chatswood • The interior, exterior and setting of the shop at 187 Miller Street, North Sydney • The fabric and setting of the North Sydney bus shelters requiring removal and temporary relocation at Victoria Cross Station and Blues Point temporary site • Any component of the Blues Point Waterfront Group and the McMahons Point South heritage conservation area to be directly affected or altered, including vegetation and significant landscape features • Hickson Road wall in the vicinity of proposed ventilation risers and skylights for Barangaroo Station • The interior, exterior and setting of the 'Flat Building' at 7 Elizabeth Street, Sydney • Martin Place, between Elizabeth and Castlereagh streets, Sydney • The heritage fabric of areas of the existing Martin Place Station affected by the project • The Rolling Stock Officers Garden, Rolling Stock Officers Building and Cleaners Amenities Building in Sydney Yard and any other component of the Sydney Terminal and Central Railway Stations group to be removed or altered • The Bounce Hostel building (former MGM building) • Directly impacted parts of the Congregational Church at Waterloo • Sydenham Pit and Drainage Pumping Station 1 • Sydenham Railway Station Group: Platform 6 building and Platform 1 Parcels Office.	CDS, VC, BP, MP, CS, WS, MDS, SS
NAH2	The archaeological research design would be implemented. Significant archaeological findings would be considered for inclusion in heritage interpretation (as per NAH8) for the project and be developed in consultation with the relevant local council.	CDS, CN, VC, BP, BN, MP, PS, CS, WS, PSR
NAH3	An Exhumation Policy and Guideline would be prepared and implemented. It would be developed in accordance with the *Guidelines for Management of Human Skeletal Remains* (NSW Heritage Office, 1998b) and NSW Health Policy Directive – Exhumation of human remains (December, 2013). It would be prepared in consultation with NSW Heritage Office and NSW Health.	All except metro rail tunnels
NAH4	The method for the demolition of existing buildings and / or structures at Chatswood dive site, Victoria Cross Station, Martin Place Station, Pitt Street Station, Central Station and Waterloo Station would be developed to minimise direct and indirect impacts to adjacent and / or adjoining heritage items.	CDS, VC, MP, PS, CS, WS
NAH5	Prior to total or partial demolition of heritage items at Victoria Cross and Martin Place stations, and the Bounce Hostel building (former MGM building at Central Station), heritage fabric for salvage would be identified and reuse opportunities for salvaged fabric considered. This would include salvage and reuse of heritage tiles to be impacted at Martin Place Station.	VC, MP, CS
NAH6	An appropriately qualified and experienced heritage architect would form part of the Sydney Metro Design Review Panel and would provide independent review periodically throughout detailed design.	All

ID	Mitigation measure	Applicable location(s)[1]
NAH7	The project design would be sympathetic to heritage items and, where reasonable and feasible, minimise impacts to the setting of heritage items. The detailed design for Martin Place Station, Central Station, Sydenham Station and the aqueduct over the Sydenham Pit and Drainage Pumping Station would be developed with input from a heritage architect.	STW, CDS, CN, VC, BN, MP, PS, CS, WS, MDS, SS
NAH8	Appropriate heritage interpretation would be incorporated into the design for the project in accordance with the NSW Heritage Manual, the NSW Heritage Office's *Interpreting Heritage Places and Items: Guidelines* (August 2005), and the NSW Heritage Council's *Heritage Interpretation Policy*.	CDS, CN, VC, BP, BN, MP, PS, WS
NAH9	A Central Station heritage interpretation plan would be developed and implemented. It would be consistent with the *Central Station Conservation Management Plan* (Rappoport and Government Architects Office, 2013) and in accordance with the guidelines identified in NAH8.	CS
NAH10	The detailed design of the Sydney Yard Access Bridge would be carried out in accordance with the relevant specific element principles in the Design Guidelines.	CS
NAH11	Except for heritage significant elements affected by the project, direct impact on other heritage significant elements forming part of the following items would be avoided: • The Blues Point Waterfront Group (including the former tram turning circle, stone retaining wall, bollards and steps) • The Millers Point and Dawes Point Village Precinct • The existing Martin Place Station • Sydney Terminal and Central Railway Stations group • Sydney Yard (including the Shunters Hut and Prince Alfred Sewer) • The existing Sydenham Station • Brick retaining walls near Sydenham Station.	BP, BN, MP, CS, SS, STWS
NAH12	Power supply works would be designed and constructed to avoid impacts to the Tank Stream and Bennelong Stormwater Channel.	PSR
NAH13	The design and detailed construction planning of work at Central Station would consider the requirements of the *Central Station Conservation Management Plan* (Rappoport and Government Architects Office, 2013) and include consideration of opportunities for the retention, conservation and / or reuse of original and significant heritage fabric and movable heritage items. Consultation would be carried out with Sydney Trains and the Heritage Council of NSW during design development.	CS
NAH14	The final design and location of the new connection and opening at Martin Place Railway Station would minimise removal of the significant red ceramic tiling where feasible and reasonable.	MP
NAH15	Opportunities for the reuse of any tiles at Martin Place Railway Station that are removed would be investigated.	MP
NAH16	Opportunities for the reuse of the circular seating within Martin Place Station would be investigated.	MP
NAH17	Opportunities for the salvage and reuse of the bus shelters temporarily removed at Victoria Cross and Blues Point would be investigated in consultation with North Sydney Council.	VC, BP
NAH18	Works at Central Station would be carried out with the oversight of heritage specialists.	CS

ID	Mitigation measure	Applicable location(s)[1]
NAH19	Subject to outcomes of consultation with the church, temporary and permanent works at the Congregational Church would: • Minimise impacts to heritage fabric • Be sympathetic to the heritage values and architectural form of the building.	WS
NAH20	The design and detailed construction planning of works directly impacting the Sydenham Pit and Drainage Pumping Station would consider the requirements of the *Sydenham Pit & Drainage Pumping Station 1 Conservation Management Plan* (Sydney Water, 2004).	MDS
NAH21	The internal and external finishes of the infilled openings between 9-19 Elizabeth Street and the Commonwealth Bank of Australia building would be developed in consultation with a heritage architect.	MP
Aboriginal heritage		
AH1	Aboriginal stakeholder consultation would be carried out in accordance with the NSW Office of Environment and Heritage's Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.	All
AH2	The cultural heritage assessment report would be implemented.	All
AH3	Archaeological test excavation (and salvage when required) would be carried out where intact natural soil profiles with the potential to contain significant archaeological deposits are encountered at the Blues Point temporary site, Barangaroo Station, Martin Place Station, Pitt Street Station, Central Station, Waterloo Station and Marrickville dive site. Excavations would be conducted in accordance with the methodology outlined in the Aboriginal cultural heritage assessment report	BP, BN, MP, PS, CS, WS, MDS
AH4	Appropriate Aboriginal heritage interpretation would be incorporated into the design for the project in consultation with Aboriginal stakeholders.	All
AH5	Feasible and reasonable mitigation at the ground improvement locations would be identified in consultation with the Office of Environment and Heritage.	GI
AH6	The Aboriginal cultural heritage assessment report would address areas of archaeological potential associated with the power supply routes.	PSR
AH7	The cultural heritage assessment report would be updated to include the scope of the proposed modification.	CS
Landscape character and visual amenity		
Construction		
LV1	Where feasible and reasonable, the elements within construction sites would be located to minimise visual impacts, for example materials and machinery would be stored behind fencing.	All except metro rail tunnels
LV2	Existing trees to be retained would be protected prior to the commencement of construction in accordance with *Australian Standard AS4970 the Australian Standard for Protection of Trees on Development Sites and Adjoining Properties*.	All except metro rail tunnels
LV3	Lighting of construction sites would be oriented to minimise glare and light spill impact on adjacent receivers.	All except metro rail tunnels
LV4	Visual mitigation would be implemented as soon as feasible and reasonable after the commencement of construction, and remain for the duration of the construction period.	All except metro rail tunnels

ID	Mitigation measure	Applicable location(s)[1]
LV5	Opportunities for the retention and protection of existing trees would be identified during detailed construction planning.	All except metro rail tunnels
LV6	The design and maintenance of construction site hoardings would aim to minimise visual amenity and landscape character impacts, including the prompt removal of graffiti. Public art opportunities would be considered.	All except metro rail tunnels
LV7	The selection of materials and colours for acoustic sheds would aim to minimise their visual prominence.	CDS, CN, VC, BN, MP, PS, WS, MDS
LV8	Tunnel boring machine retrieval works at the Blues Point temporary site would be timed to avoid key harbour viewing events.	BP
LV9	Benching would be used where feasible and reasonable at Blues Point temporary site to minimise visual amenity impacts.	BP
LV10	Temporary impacts to public open space would be rehabilitated in consultation with the relevant local council and / or landowner.	All except metro rail tunnels
Operation		
LV11	Cut off and direct light fittings (or similar technologies) would be used to minimise glare and light spill onto private property.	CDS, AS, CS, MDS
LV12	Where feasible and reasonable, vegetation would be provided to screen and visually integrate sites with the surrounding area.	STW, CDS, AS, MDS
LV13	Identify and implement appropriate landscape treatments for Frank Channon Walk.	STW, CDS
LV14	The architectural treatment of Artarmon substation would minimise visual amenity and landscape character impacts.	AS
LV15	The Harbour cycles sculpture at North Sydney would be reinstated at a location determined in consultation with North Sydney Council.	VC
LV16	The P&O Fountain, the mid-20th century bas relief sculpture and the Douglas Annand glass screen at 55 Hunter Street would be reinstated at a location determined in consultation with City of Sydney Council.	MP
LV17	Opportunities would be investigated to provide a permanent wall for street art at Marrickville dive site in consultation with Marrickville Council.	MDS
LV18	Noise barriers would be transparent where they are augmenting existing transparent noise barriers.	STW
LV19	Notification processes in relation to moral rights for public art and architecture under Commonwealth Copyright Act 1968 would be carried out.	All except metro rail tunnels

ID	Mitigation measure	Applicable location(s)[1]
Groundwater and geology		
GWG1	A detailed geotechnical model for the project would be developed and progressively updated during design and construction. The detailed geotechnical model would include: • Assessment of the potential for damage to structures, services, basements and other sub-surface elements through settlement or strain • Predicted changes to groundwater levels, including at nearby water supply works. Where building damage risk is rated as moderate or higher (as per the CIRIA 1996 risk-based criteria), a structural assessment of the affected buildings / structures would be carried out and specific measures implemented to address the risk of damage. With each progressive update of the geotechnical model the potential for exceedance of the following target changes to groundwater levels would be reviewed: • Less than 2.0 metres – general target • Less than 4.0 metres – where deep building foundations present • Less than 1.0 metre – residual soils • Less than 0.5 metre – residual soils (Blues Point) (fill / Aeolian sand). Where a significant exceedance of target changes to groundwater levels are predicted at surrounding land uses and nearby water supply works, an appropriate groundwater monitoring program would be developed and implemented. The program would aim to confirm no adverse impacts on groundwater levels or to appropriately manage any impacts. Monitoring at any specific location would be subject to the status of the water supply work and agreement with the landowner. The geotechnical model and groundwater monitoring program would be developed in consultation with the Department of Primary Industries (Water).	All
GWG2	Condition surveys of buildings and structures in the vicinity of the tunnel and excavations would be carried out prior to the commencement of excavation at each site.	All
Soils, contamination and water quality		
Construction		
SCW1	Updated desktop contamination assessments would be carried out for Chatswood dive site, Victoria Cross Station, Artarmon substation, Blues Point temporary site, Barangaroo Station, Central Station, Waterloo Station and the Sydenham Maintenance Centre site within surface track works south. If sufficient information is not available to determine the remediation requirements and the impact on potential receivers, then detailed contamination assessments, including collection and analysis of soil and groundwater samples would be carried out. Detailed contamination assessment would also be carried out for the Barangaroo power supply route within Hickson Road and the Marrickville power supply route adjacent to Sydney Park and Camdenville Oval. In the event a Remediation Action Plan is required, these would be developed in accordance with *Managing Land Contamination: Planning Guidelines SEPP 55 – Remediation of Land* (Department of Urban Affairs and Planning and Environment Protection Authority, 1998) and a site auditor would be engaged.	CDS, AS, VC, BP, BN, CS, WS, STWS, PSR
SCW2	Prior to ground disturbance in high probability acid sulfate areas at Barangaroo Station, Waterloo Station, Marrickville dive site, Sydenham Station and the surface track works south, testing would be carried out to determine the presence of acid sulfate soils. If acid sulfate soils are encountered, they would be managed in accordance with the *Acid Sulfate Soil Manual* (Acid Sulfate Soil Management Advisory Committee, 1998).	BN, WS, MDS, SS, STWS

ID	Mitigation measure	Applicable location(s)[1]
SCW3	Erosion and sediment control measures would be implemented in accordance with *Managing Urban Stormwater: Soils and Construction Volume 1* (Landcom, 2004) and *Managing Urban Stormwater: Soils and Construction Volume 2* (Department of Environment and Climate Change, 2008a). Measures would be designed as a minimum for the 80th percentile; 5-day rainfall event.	All except metro rail tunnels
SCW4	Discharges from the construction water treatment plants would be monitored to ensure compliance with the discharge criteria in an environment protection licence issued to the project.	All except metro rail tunnels
SCW5	A silt curtain would be used around the Sydney Harbour ground improvement work barges.	GI
SCW6	A water quality monitoring program would be implemented to monitor water quality within Sydney Harbour during ground improvement work. The water quality monitoring program would be carried out to detect any potential impacts on the water quality of Sydney Harbour from the ground improvement work and inform management responses in the event any impacts are identified. Specific monitoring locations and frequencies would be determined during the development of the program in consultation with the Environment Protection Authority.	GI
Operation		
SCW7	Discharges from the tunnel water treatment plant would be monitored to ensure compliance with the discharge criteria determined in consultation with the NSW Environment Protection Authority.	MDS
Social impacts and community infrastructure		
SO1	Direct impacts to public open space at the Blues Point temporary site would be minimised.	BP
SO2	Specific consultation would be carried out with sensitive community facilities (including aged care, child care centres, educational institutions and places of worship) potentially impacted during construction. Consultation would aim to identify and develop measures to manage the specific construction impacts for individual sensitive community facilities.	All except metro rail tunnels
Biodiversity		
B1	An ecologist would be present during the removal of any hollow-bearing trees.	CDS
B2	Potential bat roosting locations at Central Station, Waterloo Station and Marrickville dive site, Sydenham Station and the surface track works south would be checked by a qualified ecologist or wildlife handler prior to demolition. Any bats found would be relocated, unless in torpor, in which case the relocation would be delayed until the end of the torpor period.	CS, WS, MDS, SS, STWS
B3	The local WIRES group and / or veterinarian would be contacted if any fauna are injured on site or require capture and / or relocation.	All except metro rail tunnels
B4	Procedures would be developed and implemented, in accordance with the National System for the Prevention and Management of Marine Pest Incursions, during Sydney Harbour ground improvement works to avoid transportation of marine pests from other locations, particularly the marine alga *Caulerpa taxifoli*.	GI

ID	Mitigation measure	Applicable location(s)[1]
Flooding and hydrology		
Construction		
FH1	Detailed construction planning would consider flood risk at Barangaroo Station, Martin Place Station and the Waterloo Station construction sites. This would include identification of measures to, where feasible and reasonable, not worsen existing flooding characteristics up to and including the 100 year annual recurrence interval event in the vicinity of the project. Not worsen is defined as: • A maximum increase flood levels of 50mm in a 100 year Average Recurrence Interval flood event • A maximum increase in time of inundation of one hour in a 100 year Average Recurrence Interval flood event • No increase in the potential for soil erosion and scouring from any increase in flow velocity in a 100 year Average Recurrence Interval flood event.	BN, MP, WS
FH2	The site layout and staging of construction activities at Marrickville dive site would avoid or minimise obstruction of overland flow paths and limit the extent of flow diversion required.	MDS
FH3	Overland flow diversions during construction at the Marrickville dive site would meet the following criteria, where feasible and reasonable: • Not worsen existing flooding characteristics up to and including the 100 year annual recurrence interval event in the vicinity of the project • Dedicated evacuation routes would not be adversely impacted in flood events up to and including the probable maximum flood. This may include the requirement for changes to existing arrangements for flood warning systems and signage. Construction planning for the Marrickville dive site would be carried out in consultation with the State Emergency Services and Inner West Council. Not worsen is defined as: • A maximum increase flood levels of 50mm in a 100 year Average Recurrence Interval flood event • A maximum increase in time of inundation of one hour in a 100 year Average Recurrence Interval flood event • No increase in the potential for soil erosion and scouring from any increase in flow velocity in a 100 year Average Recurrence Interval flood event.	MDS
Operation		
FH4	Where feasible and reasonable, detailed design would result in no net increase in stormwater runoff rates in all storm events unless it can be demonstrated that increased runoff rates as a result of the project would not increase downstream flood risk.	STW, AS, MDS, SS, STWS
FH5	Where space permits, on-site detention of stormwater would be introduced where stormwater runoff rates are increased. Where there is insufficient space for the provision of on-site detention, the upgrade of downstream infrastructure would be implemented where feasible and reasonable.	STW, AS, MDS, SS, STWS
FH6	Detailed design would occur in consultation with Inner West Council to ensure future drainage improvement works around the Marrickville dive site, Sydenham Station and the surface track works south would not be precluded.	MDS, SS, STWS

ID	Mitigation measure	Applicable location(s)[1]
FH7	Consultation would be carried out with Inner West Council to ensure flood-related outcomes of the project are consistent with any future floodplain risk management study and / or plan developed for the Marrickville Valley Catchment.	MDS, SS, STWS
FH8	The frequency of Sydney Trains rail service disruptions due to flooding would not be increased in the vicinity of the Marrickville dive structure, Sydenham Station and the surface track works south.	MDS, SS, STWS
FH9	Design of the project would be reviewed to, where feasible and reasonable, not worsen existing flooding characteristics up to and including the 100 year annual recurrence interval event in the vicinity of the project. Detailed flood modelling would consider: • Potential changes to flood prone land and flood levels • Potential changes to overland flow paths • Redistribution of surface runoff as a result of project infrastructure • Behaviour of existing stormwater runoff • Potential changes required to flood evacuation routes, flood warning systems and signage. Flood modelling to support detailed design would be carried out in accordance with the following guidelines: • *Floodplain Development Manual* (NSW Government, 2005b) • *Floodplain Risk Management Guideline: Practical Consideration of Climate* Change (DECC, 2007b) • *Floodplain Risk Management Guide: Incorporating Sea Level Rise Benchmarks in Flood Risk Assessments* (DECCW, 2010c) • *New guideline and changes to section 117 direction and EP&A Regulation on flood prone land, Planning Circular PS 07-003* (NSW Department of Planning, 2007). Flood modelling and consideration of mitigation measures would be carried out in consultation with the relevant local councils, the Office of Environment and Heritage and the State Emergency Services. Not worsen is defined as: • A maximum increase flood levels of 50mm in a 100 year Average Recurrence Interval flood event • A maximum increase in time of inundation of one hour in a 100 year Average Recurrence Interval flood event • No increase in the potential for soil erosion and scouring from any increase in flow velocity in a 100 year Average Recurrence Interval flood event.	All except metro rail tunnels
FH10	During detailed design, project infrastructure would be designed to meet the following criteria, where feasible and reasonable: • Locate station and service entrances to underground stations above the greater of the 100 year annual recurrence interval flood level plus 500mm or the probable maximum flood level • Provide site surface grading and drainage collection systems at the Chatswood and Marrickville dive structures to manage the risk of local catchment and overland flooding for events up to and including the probable maximum flood event • Locate aboveground rail system facilities (such as traction power supply sub stations) at least above the 100 year annual recurrence interval flood level plus 500mm • Protect facilities that are identified as being critical to emergency response operations from the probable maximum flood level.	All except metro rail tunnels

ID	Mitigation measure	Applicable location(s)[1]
Air quality		
AQ1	The engines of all on-site vehicles and plant would be switched off when not in use for an extended period.	All
AQ2	Plant would be well maintained and serviced to minimise emissions. Emissions from plant would be considered as part of pre-acceptance checks.	All
AQ3	Construction site layout and placement of plant would consider air quality impacts to nearby receivers.	All except metro rail tunnels
AQ4	Hard surfaces would be installed on long term haul routes and regularly cleaned.	All except metro rail tunnels
AQ5	Unsurfaced haul routes and work area would be regularly damped down in dry and windy conditions.	All except metro rail tunnels
AQ6	All vehicles carrying loose or potentially dusty material to or from the site would be fully covered.	All except metro rail tunnels
AQ7	Stockpiles would be managed to minimise dust generation.	All except metro rail tunnels
AQ8	Demolition would be managed to minimise dust generation.	All except metro rail tunnels
AQ9	Ventilation from acoustic sheds would be filtered.	CDS, CN, VC, BN, MP, PS, WS, MDS
Hazard and risk		
Construction		
HR1	All hazardous substances that may be required for construction would be stored and managed in accordance with the *Storage and Handling of Dangerous Goods Code of Practice* (WorkCover NSW, 2005) and *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33* (Department of Planning, 2011).	All
HR2	Dial before you dig searches and non-destructive digging would be carried out to identify the presence of underground utilities.	All
HR3	A hazardous material survey would be completed for those buildings and structures suspected of containing hazardous materials (particularly asbestos) prior to their demolition. If asbestos is encountered, it would be handled and managed in accordance with relevant legislation, codes of practice and Australian standards.	CDS, CN, VC, MP, PS, CS, WS, MDS, SS
HR4	The method for delivery of explosives would developed prior to the commencement of blasting in consultation with the Department of Planning and Environment and be timed to avoid the need for on-site storage.	CN, VC, BN, MP, PS, WS
Operation		
HR5	All hazardous substances that may be required for operation would be stored and managed in accordance with the *Storage and Handling of Dangerous Goods Code of Practice* (WorkCover NSW, 2005) and *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33* (Department of Planning, 2011).	All

ID	Mitigation measure	Applicable location(s)[1]
Waste management		
Construction		
WM1	All waste would be assessed, classified, managed and disposed of in accordance with the *NSW Waste Classification Guidelines*.	All
WM2	100 per cent of spoil that can be reused would be beneficially reused in accordance with the project spoil reuse hierarchy.	All
WM3	A recycling target of at least 90 per cent would be adopted for the project.	All
WM4	Construction waste would be minimised by accurately calculating materials brought to the site and limiting materials packaging.	All
Operation		
WM5	Generation of operation phase waste would be minimised.	All
Sustainability		
Construction		
SUS1	Sustainability initiatives would be incorporated into the detailed design and construction of the project to support the achievement of the project sustainability objectives.	All
SUS2	A best practice level of performance would be achieved using market leading sustainability rating tools during design and construction.	All
SUS3	A workforce development and industry participation strategy would be developed and implemented during construction.	All
SUS4	Climate change risk treatments would be incorporated into the detailed design of the project including: • Ensuring that adequate flood modelling is carried out and integrated with design • Testing the sensitivity of air-conditioning systems to increased temperatures, and identify potential additional capacity of air-conditioning systems that may be required within the life of the project, with a view to safeguarding space if required • Testing the sensitivity of ventilation systems to increased temperatures and provide adequate capacity.	All
SUS5	An iterative process of greenhouse gas assessments and design refinements would be carried out during detailed design and construction to identify opportunities to minimise greenhouse gas emissions. Performance would be measured in terms of a percentage reduction in greenhouse gas emissions from a defined reference footprint.	All
SUS6	25 per cent of the greenhouse gas emissions associated with consumption of electricity during construction would be offset.	All
Operation		
SUS7	Sustainability initiatives would be incorporated into the operation of the project to support the achievement of the project sustainability objectives.	All
SUS8	Periodic review of climate change risks would be carried out to ensure ongoing resilience to the impacts of climate change.	All
SUS9	A workforce development and industry participation strategy would be developed and implemented during operation.	All
SUS10	100 per cent of the greenhouse gas emissions associated with consumption of electricity during operation would be offset.	All

ID	Mitigation measure	Applicable location(s)[1]
Cumulative impacts		

CU1	Transport for NSW would manage and co-ordinate the interface with projects under construction at the same time. Co-ordination and consultation with the following stakeholders would occur, where required:
	• CBD Coordination Office
	• Department of Planning and Environment
	• Roads and Maritime Services
	• Sydney Trains
	• NSW Trains
	• Sydney Buses
	• Sydney Water
	• Port Authority of NSW
	• Willoughby Council
	• North Sydney Council
	• City of Sydney Council
	• Marrickville Council
	• Sydney Motorways Corporation
	• Barangaroo Delivery Authority
	• Emergency service providers
	• Utility providers
	• Construction contractors.
	Co-ordination and consultation with these stakeholders would include:
	• Provision of regular updates to the detailed construction program, construction sites and haul routes
	• Identification of key potential conflict points with other construction projects
	• Developing mitigation strategies in order to manage conflicts. Depending on the nature of the conflict, this could involve:
	  ♦ Adjustments to the Sydney Metro construction program, work activities or haul routes; or adjustments to the program, activities or haul routes of other construction projects
	  ♦ Co-ordination of traffic management arrangements between projects.
		All

1 *STW: Surface track works; CDS: Chatswood dive site; AS: Artarmon substation; CN: Crows Nest Station; VC: Victoria Cross Station; BP: Blues Point temporary site; GI: Ground improvement works; BN: Barangaroo Station; MP: Martin Place Station; PS: Pitt Street Station; CS: Central Station; WS: Waterloo Station; MDS: Marrickville dive site (including the Sydney Metro Trains Facility South); SS: Sydenham Station; STWS: Surface track works south Metro rail tunnels: Metro rail tunnels not related to other sites (eg TBM works); PSR: Power supply routes.*

GLOSSARY

Glossary

Term	Meaning
ANZECC	Australian and New Zealand Environment Conservation Council
CEMP	Construction Environmental Management Plan
dB	Decibels
dBA	A-weighted decibels
DCP	Development Control Plan
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ICNG	Interim Construction Noise Guideline
INP	*Industrial Noise Policy*
LEP	Local Environmental Plan
LGA	Local Government Area
mm/s	Millimetres per second
NCAs	Noise catchment areas
NMLs	Noise management levels
NW Act	*Noxious Weeds Act 1993*
OEH	Office of Environment and Heritage
pH	Potential of hydrogen
PPV	Peak Particle Velocity
PTPM	Public Transport Project Model
RBL	Rating background level
RNP	Road Noise Policy
Roads and Maritime	Roads and Maritime Services
SWL	Sound power level
TSC Act	*Threatened Species Conservation Act 1995*
VDV	Vibration Dose Value
WQOs	Water Quality Objectives

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REFERENCES

References

ANZECC 2000, *Australian Water Quality Guidelines for Fresh and Marine Waters*, Australian and New Zealand Environment and Conservation Council, Kingston.

Australian Standard: 4282:1997 – *Control of the Obtrusive Effects of Outdoor Lighting*

Australian Standard: 4970-2009 – Protection of trees on development sites

Department of Environment, Climate Change and Water, 2011a, *NSW Road Noise Policy*

Environment Protection Authority, 2000, *Industrial Noise Policy*

Institution of Lighting Engineers (UK) 2005, *Guidance for the reduction of obtrusive light*.

North Sydney Council, 2013a, *North Sydney Local Environmental Plan 2013*

North Sydney Council, 2013b, *North Sydney Development Control Plan 2013*

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CHATSWOOD TO SYDENHAM

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