

CHATSWOOD TO SYDENHAM  
**CENTRAL WALK  
MODIFICATION REPORT**

APPENDICES



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# **SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS**

APPENDIX A



# Secretary's environmental assessment requirements

Desired Performance Outcome	Requirement	Where addressed
<b>1. Environmental Impact Assessment Process</b> The process for assessment of the proposal is transparent, balanced, well focussed and legal.	<b>1.</b> The Environmental Impact Statement must be prepared in accordance with Part 3 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 (the Regulation).	Not applicable
	<b>2.</b> It is the Proponent's responsibility to determine whether the project needs to be referred to the Commonwealth Department of the Environment for an approval under the <i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act). The Proponent must contact the Commonwealth Department of the Environment immediately if it is determined that an approval is required under the EPBC Act, as supplementary environmental assessment requirements may need to be issued to ensure a streamlined assessment under the Bilateral agreement can be achieved.  <b>3.</b> Where the project requires approval under the EPBC Act and is being assessed under the Bilateral Agreement the EIS should address: <ul style="list-style-type: none"> <li><b>a.</b> Consideration of any Protected Matters that may be impacted by the development where the Commonwealth Minister has determined that the proposal is a Controlled Action.</li> <li><b>b.</b> Identification and assessment of those Protected Matters that are likely to be significantly impacted.</li> <li><b>c.</b> Details of how significant impacts to Protected Matters have been avoided, mitigated and, if necessary, offset.</li> <li><b>d.</b> Consideration of, and reference to, any relevant conservation advices, recovery plans and threat abatement plans.</li> </ul> <b>4.</b> The onus is on the Proponent to ensure legislative requirements relevant to the project are met.	Chapter 4

Desired Performance Outcome	Requirement	Where addressed
<b>2. Environmental Impact Statement</b> The project is described in sufficient detail to enable clear understanding that the project has been developed through an iterative process of impact identification and assessment and project refinement to avoid, minimise or offset impacts so that the project, on balance, has the least adverse environmental, social and economic impact, including its cumulative impacts.	<b>1.</b> The EIS must include, but not necessarily be limited to, the following: <ul style="list-style-type: none"> <li><b>a.</b> executive summary;</li> <li><b>b.</b> a description of the project, including all components and activities (including ancillary components and activities) required to construct and operate it;</li> <li><b>c.</b> a statement of the objective(s) of the project;</li> <li><b>d.</b> a summary of the strategic need for the project with regard to its critical State significance and relevant State Government policy;</li> <li><b>e.</b> an analysis of any feasible alternatives to the project;</li> <li><b>f.</b> a description of feasible options within the project;</li> <li><b>g.</b> a description of how alternatives to and options within the project were analysed to inform the selection of the preferred alternative / option. The description must contain sufficient detail to enable an understanding of why the preferred alternative to and options(s) within the project were selected;</li> <li><b>h.</b> potential opportunities for further network expansion and consideration of relationship to other Government public transport initiatives; a concise description of the general biophysical and socioeconomic environment that is likely to be impacted by the project (including offsite impacts). Elements of the environment that are not likely to be affected by the project do not need to be described;</li> <li><b>i.</b> a demonstration of how the project design has been developed to avoid or minimise likely adverse impacts;</li> <li><b>j.</b> the identification and assessment of key issues as provided in the ‘Assessment of Key Issues’ performance outcome;</li> <li><b>k.</b> a statement of the outcome(s) the proponent will achieve for each key issue;</li> <li><b>l.</b> measures to avoid, minimise or offset impacts must be linked to the impact(s) they treat, so it is clear which measures will be applied to each impact;</li> <li><b>m.</b> an assessment of the cumulative impacts of the project taking into account other projects that have been approved but where construction has not commenced, projects that have commenced construction, and projects that have recently been completed (for example WestConnex, Barangaroo, any approved construction in the relevant precincts);</li> </ul>	Not applicable, however the following is noted: <ul style="list-style-type: none"> <li>• Description of the modification is provided in Chapters 6 and 7</li> <li>• Need and justification for the modification is provided in Chapter 2</li> <li>• Options analysis for the elements of the modification is provided in Chapter 3</li> </ul>

Desired Performance Outcome	Requirement	Where addressed
	<p><b>n.</b> statutory context of the project as a whole, including:</p> <ul style="list-style-type: none"> <li>– how the project meets the provisions of the EP&amp;A Act and EP&amp;A Regulation;</li> <li>– a list of any approvals that must be obtained under any other Act or law before the project may lawfully be carried out;</li> </ul> <p><b>o.</b> a chapter that synthesises the environmental impact assessment and provides:</p> <ul style="list-style-type: none"> <li>– a succinct but full description of the project for which approval is sought;</li> <li>– a description of any uncertainties that still exist around design, construction methodologies and/or operational methodologies and how these will be resolved in the next stages of the project;</li> <li>– a compilation of the impacts of the project that have not been avoided;</li> <li>– a compilation of the proposed measures associated with each impact to avoid or minimise (through design refinements or ongoing management during construction and operation) or offset these impacts;</li> <li>– a compilation of the outcome(s) the proponent will achieve; and</li> <li>– the reasons justifying carrying out the project as proposed, having regard to the biophysical, economic and social considerations, including ecologically sustainable development and cumulative impacts.</li> </ul> <p><b>p.</b> relevant project plans, drawings, diagrams in an electronic format that enables integration with mapping and other technical software.</p> <p><b>2.</b> The EIS must only include data and analysis that is reasonably needed to make a decision on the proposal. Relevant information must be succinctly summarised in the EIS and included in full in appendices. Irrelevant, conflicting or duplicated information must be avoided.</p>	

Desired Performance Outcome	Requirement	Where addressed
<b>3. Assessment of Key Issues*</b> Key issue impacts are assessed objectively and thoroughly to provide confidence that the project will be constructed and operated within acceptable levels of impact. * Key issues are nominated by the Proponent in the CSSI project application and by the Department in the SEARs. Key issues need to be reviewed throughout the preparation of the EIS to ensure any new key issues that emerge are captured. The key issues identified in this document are not exhaustive but are key issues common to most CSSI projects.	<b>1.</b> The level of assessment of likely impacts must be proportionate to the significance of, or degree of impact on, the issue, within the context of the proposal location and the surrounding environment. The level of assessment must be commensurate to the degree of impact and sufficient to ensure that the Department and other government agencies are able to understand and assess impacts.	Chapters 9 to 20
	<b>2.</b> For each key issue the Proponent must: <ul style="list-style-type: none"> <li><b>a.</b> describe the biophysical and socio-economic environment, as far as it is relevant to that issue;</li> <li><b>b.</b> describe the legislative and policy context, as far as it is relevant to the issue;</li> <li><b>c.</b> identify, describe and quantify (if possible) the impacts associated with the issue, including the likelihood and consequence (including worst case scenario) of the impact (comprehensive risk assessment), and the cumulative impacts;</li> <li><b>d.</b> demonstrate how potential impacts have been avoided (through design, or construction or operation methodologies);</li> <li><b>e.</b> detail how likely impacts that have not been avoided through design will be minimised, and the predicted effectiveness of these measures (against performance criteria where relevant).</li> </ul>	Chapters 9 to 20
	<b>3.</b> Where multiple reasonable and feasible options to avoid or minimise impacts are available, they must be identified and considered and the proposed measure justified taking into account the public interest.	Chapter 3
<b>4. Consultation</b> The project is developed with meaningful and effective engagement during project design and delivery.	<b>1.</b> The project must be informed by consultation, including with relevant government agencies, infrastructure and service providers, special interest groups, affected landowners, businesses and the community. The consultation process must be undertaken in accordance with the current guidelines. <b>2.</b> The Proponent must document the consultation process, and demonstrate how the project has responded to the inputs received. <b>3.</b> The Proponent must describe the timing and type of community consultation proposed during the design and delivery of the project, the mechanisms for community feedback, the mechanisms for keeping the community informed, and procedures for complaints handling and resolution.	Chapter 5



Desired Performance Outcome	Requirement	Where addressed
<p><b>5. Biodiversity</b></p> <p>The project design considers all feasible measures to avoid and minimise impacts on terrestrial and aquatic biodiversity.</p> <p>Offsets and/or supplementary measures are assured which are equivalent to any remaining impacts of project construction and operation.</p>	<ol style="list-style-type: none"> <li>1. The Proponent must assess biodiversity impacts in accordance with the current guidelines including the Framework for Biodiversity Assessment (FBA).</li> <li>2. The Proponent must assess any impacts on biodiversity values not covered by the FBA as specified in s2.3.</li> <li>3. The Proponent must assess impacts on the following [EECs, threatened species and/or populations] and provide the information specified in s9.2 of the FBA.</li> <li>4. The Proponent must identify whether the project as a whole, or any component of the project, would be classified as a Key Threatening Process (KTP) in accordance with the listings in the <i>Threatened Species Conservation Act 1997</i> (TSC Act), <i>Fisheries Management Act 1994</i> (FM Act) and <i>Environmental Protection and Biodiversity Conservation Act 2000</i> (EPBC Act).</li> </ol>	Not applicable
<p><b>6. Flooding</b></p> <p>The project minimises adverse impacts on existing flooding characteristics.</p> <p>Construction and operation of the project avoids or minimises the risk of, and adverse impacts from, infrastructure flooding, flooding hazards, or dam failure.</p>	<ol style="list-style-type: none"> <li>1. The Proponent must assess and model (where required), taking into account any relevant Council-adopted flood model or latest flood data available from Councils, the impacts on flood behaviour during construction and operation for a full range of flood events up to the probable maximum flood (taking into account sea level rise and storm intensity due to climate change) including: <ol style="list-style-type: none"> <li>a. any detrimental increases in the potential flood affectation of other properties, assets and infrastructure;</li> <li>b. consistency (or inconsistency) with applicable Council floodplain risk management plans;</li> <li>c. compatibility with the flood hazard of the land;</li> <li>d. compatibility with the hydraulic functions of flow conveyance in flood ways and storage areas of the land;</li> <li>e. downstream velocity and scour potential;</li> <li>f. impacts the development may have upon existing community emergency management arrangements for flooding. These matters must be discussed with the State Emergency Services and Council; and</li> <li>g. any impacts the development may have on the social and economic costs to the community as consequence of flooding.</li> </ol> </li> </ol>	Chapter 19

Desired Performance Outcome	Requirement	Where addressed
<b>7. Heritage</b> The design, construction and operation of the project facilitates, to the greatest extent possible, the long term protection, conservation and management of the heritage significance of items of environmental heritage and Aboriginal objects and places. The design, construction and operation of the project avoids or minimises impacts, to the greatest extent possible, on the heritage significance of environmental heritage and Aboriginal objects and places.	<b>1.</b> The Proponent must identify and assess any direct and/or indirect impacts (including cumulative impacts) to the heritage significance of:	Chapter 14 Chapter 15 Chapter 20
	<b>a.</b> Aboriginal places and objects, as defined under the <i>National Parks and Wildlife Act 1974</i> and in accordance with the principles and methods of assessment identified in the current guidelines;	Chapter 15
	<b>b.</b> Aboriginal places of heritage significance, as defined in the Standard Instrument – Principal Local Environmental Plan;	Chapter 15
	<b>c.</b> environmental heritage, as defined under the <i>Heritage Act 1977</i> ; and <b>d.</b> items listed on the National and World Heritage lists.	Chapter 14
	<b>2.</b> Where impacts to State or locally significant heritage items are identified, the assessment must:	
	<b>a.</b> include a statement of heritage impact for all heritage items (including significance assessment); <b>b.</b> consider impacts to the item of significance caused by, but not limited to, vibration, demolition, archaeological disturbance, altered historical arrangements and access, visual amenity, landscape and vistas, curtilage, subsidence and architectural noise treatment (as relevant);	
	<b>c.</b> outline measures to avoid and minimise those impacts in accordance with the current guidelines; and <b>d.</b> be undertaken by a suitably qualified heritage consultant(s) (note: where archaeological excavations are proposed the relevant consultant must meet the NSW Heritage Council’s Excavation Director criteria).	Chapter 14 Chapter 15
	<b>3.</b> Where archaeological investigations of Aboriginal objects are proposed these must be conducted by a suitably qualified archaeologist, in accordance with section 1.6 of the <i>Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW</i> (DECCW 2010).	Chapter 15
	<b>4.</b> Where impacts to Aboriginal objects and/or places are proposed, consultation must be undertaken with Aboriginal people in accordance with the current guidelines.	Chapter 15

Desired Performance Outcome	Requirement	Where addressed
<b>8. Noise and Vibration – Amenity</b> Construction noise and vibration (including airborne noise, ground-borne noise and blasting) are effectively managed to minimise adverse impacts on acoustic amenity. Increases in noise emissions and vibration affecting nearby properties and other sensitive receivers during operation of the project are effectively managed to protect the amenity and well-being of the community.	<b>1.</b> The Proponent must assess construction and operational noise and vibration impacts in accordance with relevant NSW noise and vibration guidelines. The assessment must include consideration of impacts to sensitive receivers including commercial premises, and include consideration of sleep disturbance and, as relevant, the characteristics of noise and vibration (for example, low frequency noise).	Chapter 11
	<b>2.</b> If blasting is required, the relevant requirements of <i>Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration</i> (ANZEC 1990) are to be assessed.	Chapter 11
<b>9. Noise and Vibration – Structural</b> Construction noise and vibration (including airborne noise, ground-borne noise and blasting) are effectively managed to minimise adverse impacts on the structural integrity of buildings and items including Aboriginal places and environmental heritage. Increases in noise emissions and vibration affecting environmental heritage as defined in the <i>Heritage Act 1977</i> during operation of the project are effectively managed.	<b>1.</b> The Proponent must assess construction and operation noise and vibration impacts in accordance with relevant NSW noise and vibration guidelines. The assessment must include consideration of impacts to the structural integrity and heritage significance of items (including Aboriginal places and items of environmental heritage).	Chapter 11 Chapter 14
	<b>2.</b> The Proponent must demonstrate that blast impacts are capable of complying with the current guidelines, if blasting is required.	Chapter 11
<b>10. Socio-economic, Land Use and Property</b> The project minimises adverse social and economic impacts and capitalises on opportunities potentially available to affected communities. The project minimises impacts to property and business and achieves appropriate integration with adjoining land uses, including maintenance of appropriate access to properties and community facilities, and minimisation of displacement of existing land use activities, dwellings and infrastructure.	<b>1.</b> The Proponent must assess social and economic impacts in accordance with the current guidelines.	Chapter 13
	<b>2.</b> The Proponent must assess impacts from construction and operation on potentially affected properties, approved development applications, businesses, public open space, recreational users and land and water users (for example, recreational and commercial fishers, oyster farmers), including property acquisitions/adjustments, access, amenity and relevant statutory rights.	Chapter 12 Chapter 13 Chapter 9 Chapter 20
	<b>3.</b> Assess the likely risks of the project to public safety, paying particular attention to subsidence risks, bushfire risks and the handling and use of dangerous goods.	Not applicable

Desired Performance Outcome	Requirement	Where addressed
<b>11. Soils</b> The environmental values of land, including soils, subsoils and landforms, are protected.  Risks arising from the disturbance and excavation of land and disposal of soil are minimised, including disturbance to acid sulfate soils and site contamination.	<b>1.</b> The Proponent must verify the risk of acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Risk Map) within, and in the area likely to be impacted by, the project.	Not applicable
	<b>2.</b> The Proponent must assess the impact of the project on acid sulfate soils (including impacts of acidic runoff offsite) in accordance with the current guidelines.	Not applicable
	<b>3.</b> The Proponent must assess whether the land is likely to be contaminated and identify if remediation of the land is required, having regard to the ecological and human health risks posed by the contamination in the context of past, existing and future land uses. Where assessment and/or remediation is required, the Proponent must document how the assessment and/or remediation would be undertaken in accordance with current guidelines.	Chapter 18
	<b>4.</b> The Proponent must assess whether salinity is likely to be an issue and if so, determine the presence, extent and severity of soil salinity within the project area.	Not applicable
	<b>5.</b> The Proponent must assess the impacts of the project on soil salinity and how it may affect groundwater resources and hydrology.	Not applicable
	<b>6.</b> The Proponent must assess the impacts on soil and land resources (including erosion risk or hazard). Particular attention must be given to soil erosion and sediment transport consistent with the practices and principles in the current guidelines.	Not applicable
<b>12. Sustainability</b> The project reduces the NSW Government’s operating costs and ensures the effective and efficient use of resources.  Conservation of natural resources is maximised.	<b>1.</b> The Proponent must assess the project against the current guidelines including targets and strategies to improve Government efficiency in use of water, energy and transport.	Not applicable
<b>13. Transport and Traffic</b> Network connectivity, safety and efficiency of the transport system in the vicinity of the project are managed to minimise impacts.  The safety of transport system customers is maintained.  Impacts on network capacity and the level of service are effectively managed.  Works are compatible with existing infrastructure and future transport corridors.	<b>1.</b> The Proponent must assess construction transport and traffic (vehicle, pedestrian and cyclists) impacts, including, but not necessarily limited to:	
	<b>a.</b> a considered approach to route identification and scheduling of transport movements;	Chapter 8
	<b>b.</b> the number, frequency and size of construction related vehicles (passenger, commercial and heavy vehicles, including spoil management movements);	Chapter 8
	<b>c.</b> the capacity of or need to upgrade roads proposed as construction vehicle routes including Bedwin Road;	Chapter 8
	<b>d.</b> changes to existing local and regional road networks including access to and around the proposed Chatswood tunnelling site;	Chapter 8

Desired Performance Outcome	Requirement	Where addressed
	<b>e.</b> construction worker parking;	Chapter 8
	<b>f.</b> the nature of existing traffic (types and number of movements) on construction access routes (including consideration of peak traffic times and sensitive road users and parking arrangements), including access to the Overseas Passenger Terminal for deliveries and passenger coaches;	Chapter 8
	<b>g.</b> details of how construction and scheduling of works are to be coordinated in regard to public events; cumulative traffic impacts resulting from concurrent work on Westconnex, Barangaroo, Sydney Light Rail and other key construction projects in the Sydney CBD;	Chapter 20
	<b>h.</b> alternatives to road transport of construction spoil;	Chapter 8
	<b>i.</b> access constraints and impacts on public transport, pedestrian access and cyclists;	Chapter 8
	<b>j.</b> the need to close, divert or otherwise reconfigure elements of the road and cycle network associated with construction of the project;	Chapter 8
	<b>k.</b> assess the likely risks of the project to public safety, paying particular attention to pedestrian safety and users of Sydney Harbour; and	Chapter 8
	<b>l.</b> impacts to water based traffic and shipping channels on users of Sydney Harbour with particular reference to the channel between Blues Point and Millers Point for passage to and from White Bay, Glebe Island and Gore Cove.	Not applicable
	<b>2.</b> The Proponent must assess the operational transport impacts of the project, including: <ul style="list-style-type: none"> <li><b>a.</b> forecast travel demand and traffic volumes for the project and the surrounding road, cycle and public transport network;</li> <li><b>b.</b> travel time analysis;</li> <li><b>c.</b> performance of interchanges and intersections by undertaking a coordinated level of service analysis at locations affected by stations;</li> <li><b>d.</b> wider transport interactions (local and regional roads, permanent loss of parking, the need for kiss-and-ride facilities, cycling, public and freight transport);</li> <li><b>e.</b> induced traffic and operational implications for public transport (particularly with respect to strategic bus corridors and bus routes) and consideration of opportunities to improve public transport;</li> <li><b>f.</b> impacts to pedestrian access in and around stations and connecting streets, capacity of streets at peak pedestrian times, including phasing of traffic lights, intersection crossing times and connectivity between stations</li> </ul>	Chapter 9

Desired Performance Outcome	Requirement	Where addressed
	<ul style="list-style-type: none"> <li><b>g.</b> assess the benefits to each station and the general vicinity of walking and cycling catchments and the provision of infrastructure to support sustainable transport options.</li> <li><b>h.</b> impacts on cyclists and pedestrian access and safety; and</li> <li><b>i.</b> opportunities to integrate cycling and pedestrian elements with surrounding networks and in the project.</li> </ul>	
<b>14. Urban design</b> The project design complements the visual amenity, character and quality of the surrounding environment. The project contributes to the accessibility and connectivity of communities.	<ol style="list-style-type: none"> <li><b>1.</b> The Proponent must: <ul style="list-style-type: none"> <li><b>a.</b> identify the urban design and landscaping aspects of the project and its components;</li> <li><b>b.</b> include consideration of urban design principles adopted by each council or within each station precinct;</li> <li><b>c.</b> assess the impact of the project on the urban, rural and natural fabric;</li> <li><b>d.</b> explore the use of Crime Prevention Through Environmental Design (CPTED) principles during the design development process, including natural surveillance, lighting, walkways, signage and landscape; and</li> <li><b>e.</b> identify urban design strategies and opportunities to enhance healthy, cohesive and inclusive communities.</li> </ul> </li> </ol>	Chapter 6 Chapter 16
<b>15. Visual Amenity</b> The project minimises adverse impacts on the visual amenity of the built and natural environment (including public open space) and capitalises on opportunities to improve visual amenity.	<ol style="list-style-type: none"> <li><b>1.</b> The Proponent must assess the visual impact of the project and any ancillary infrastructure on: <ul style="list-style-type: none"> <li><b>a.</b> views and vistas;</li> <li><b>b.</b> streetscapes, key sites and buildings;</li> <li><b>c.</b> the local community.</li> </ul> </li> <li><b>2.</b> The Proponent must provide artist impressions and perspective drawings of the project to illustrate how the project has responded to the visual impact through urban design and landscaping.</li> </ol>	Chapter 16
<b>16. Waste</b> All wastes generated during the construction and operation of the project are effectively stored, handled, treated, reused, recycled and/or disposed of lawfully and in a manner that protects environmental values.	<ol style="list-style-type: none"> <li><b>1.</b> The Proponent must assess predicted waste generated from the project during construction and operation, including: <ul style="list-style-type: none"> <li><b>a.</b> classification of the waste in accordance with the current guidelines;</li> <li><b>b.</b> estimates / details of the quantity of bulk earthworks and spoil balance to be generated during construction of the project;</li> <li><b>c.</b> handling of waste including measures to facilitate segregation and prevent cross contamination;</li> <li><b>d.</b> management of waste including indicative location and volume of stockpiles;</li> <li><b>e.</b> waste minimisation and reuse;</li> </ul> </li> </ol>	Not applicable

Desired Performance Outcome	Requirement	Where addressed
	<ul style="list-style-type: none"> <li><b>f.</b> lawful disposal or recycling locations for each type of waste using a hierarchy which prioritises higher value end use; and</li> <li><b>g.</b> contingencies for the above, including managing unexpected waste volumes.</li> </ul> <p><b>2.</b> The Proponent must assess potential environmental impacts from the excavation, handling, storage on site and transport of the waste particularly with relation to sediment/leachate control, noise and dust.</p>	
<p><b>17. Water – Hydrology</b></p> <p>Long term impacts on surface water and groundwater hydrology (including drawdown, flow rates and volumes) are minimised.</p> <p>The environmental values of nearby, connected and affected water sources, groundwater and dependent ecological systems including estuarine and marine water (if applicable) are maintained (where values are achieved) or improved and maintained (where values are not achieved).</p> <p>Sustainable use of water resources.</p>	<p><b>1.</b> The Proponent must describe (and map) the existing hydrological regime for any surface and groundwater resource (including reliance by users and for ecological purposes) likely to be impacted by the project, including stream orders, as per the FBA.</p>	Chapter 17 Chapter 19
	<p><b>2.</b> The Proponent must assess (and model if appropriate) the impact of the construction and operation of the project and any ancillary facilities (both built elements and discharges) on surface and groundwater hydrology in accordance with the current guidelines, including:</p>	Chapter 17 Chapter 19
	<ul style="list-style-type: none"> <li><b>a.</b> natural processes within rivers, wetlands, estuaries, marine waters and floodplains that affect the health of the fluvial, riparian, estuarine or marine system and landscape health (such as modified discharge volumes, durations and velocities), aquatic connectivity and access to habitat for spawning and refuge;</li> </ul>	Not applicable
	<ul style="list-style-type: none"> <li><b>b.</b> impacts from any permanent and temporary interruption of groundwater flow, including the extent of drawdown, barriers to flows, implications for groundwater dependent surface flows, ecosystems and species, groundwater users and the potential for settlement;</li> </ul>	Chapter 17
	<ul style="list-style-type: none"> <li><b>c.</b> changes to environmental water availability and flows, both regulated/licensed and unregulated/rules-based sources;</li> </ul>	Not applicable
	<ul style="list-style-type: none"> <li><b>d.</b> direct or indirect increases in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses;</li> </ul>	Not applicable
	<ul style="list-style-type: none"> <li><b>e.</b> minimising the effects of proposed stormwater and wastewater management during construction and operation on natural hydrological attributes (such as volumes, flow rates, management methods and re-use options) and on the conveyance capacity of existing stormwater systems where discharges are proposed through such systems; and</li> </ul>	Chapter 19
	<ul style="list-style-type: none"> <li><b>f.</b> water take (direct or passive) from all surface and groundwater sources with estimates of annual volumes during construction and operation.</li> </ul>	Chapter 17
	<p><b>3.</b> The Proponent must identify any requirements for baseline monitoring of hydrological attributes.</p>	Not applicable



Desired Performance Outcome	Requirement	Where addressed
<b>18. Water – Quality</b> The project is designed, constructed and operated to protect the NSW Water Quality Objectives where they are currently being achieved, and contribute towards achievement of the Water Quality Objectives over time where they are currently not being achieved, including downstream of the project to the extent of the project impact including estuarine and marine waters (if applicable).	<b>1. The Proponent must:</b> <ol style="list-style-type: none"> <li>state the ambient NSW Water Quality Objectives (NSW WQO) and environmental values for the receiving waters relevant to the project, including the indicators and associated trigger values or criteria for the identified environmental values;</li> <li>identify all pollutants that may be introduced into the water cycle and describe the nature and degree of impact that any discharge(s) may have on the receiving environment, including consideration of all pollutants that pose a risk of non-trivial harm to human health and the environment;</li> <li>identify the rainfall event that the water quality protection measures will be designed to cope with;</li> <li>assess the significance of any identified impacts including consideration of the relevant ambient water quality outcomes;</li> <li>demonstrate how construction and operation of the project will, to the extent that the project can influence, ensure that:               <ul style="list-style-type: none"> <li>where the NSW WQOs for receiving waters are currently being met they will continue to be protected; and</li> <li>where the NSW WQOs are not currently being met, activities will work toward their achievement over time;</li> </ul> </li> <li>justify, if required, why the WQOs cannot be maintained or achieved over time;</li> <li>demonstrate that all practical measures to avoid or minimise water pollution and protect human health and the environment from harm are investigated and implemented;</li> <li>identify sensitive receiving environments (which may include estuarine and marine waters downstream) and develop a strategy to avoid or minimise impacts on these environments; and</li> <li>identify proposed monitoring locations, monitoring frequency and indicators of surface and groundwater quality.</li> </ol>	Not applicable
<b>19. Utilities</b> The project is designed, construction and operated to minimise impacts to utilities and provision of such to the public.	<b>1. The Proponent must consider:</b> <ol style="list-style-type: none"> <li>the impact of the project on the integrity of trunk assets and the need to augment or relocate;</li> <li>opportunities to support initiatives adopted by Councils and utilities providers; and</li> <li>how access to assets will be maintained during construction.</li> </ol>	Chapter 7



# **CHATSWOOD TO SYDENHAM DESIGN GUIDELINES**

APPENDIX B



# Sydney Metro City & Southwest

## Chatswood to Sydenham Design Guidelines

June 2017









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## 1.1 Purpose of these Guidelines

The Guidelines will support the development of healthy, cohesive and inclusive communities.

The Guidelines establish the design standards for the Sydney Metro Chatswood to Sydenham project (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 drive structures, rail cuttings and embankments.
  - Station and service buildings, including underground stations

Any development above Metro stations would be subject to a separate planning approval.

The Guidelines have been developed to respond to the strategic directions and urban design strategies of the local Councils. The Guidelines will be used by Transport for NSW (TfNSW) to guide the design development process for the project.

The Sydney Metro Delivery Office, part of TfNSW, is managing the planning, procurement and delivery of the Sydney Metro Network.



Grand Concourse, Central Station, Sydney. Accommodating Sydney's growing population in a manner that protects Sydney's status as a global city.  
*Source: TfNSW.*



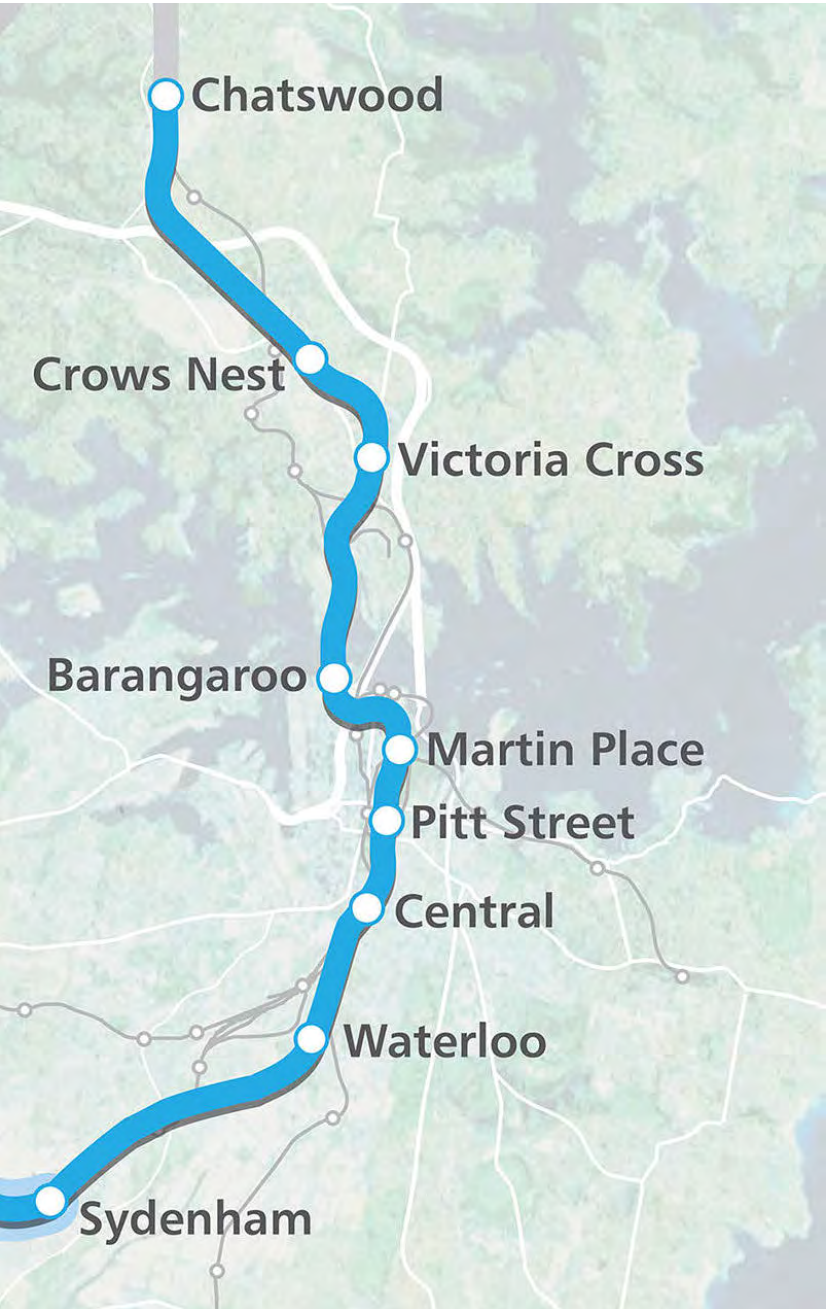
# 1.2 Project Scope

The Chatswood to Sydenham component of the Project includes the construction and operation of a new metro rail line from Chatswood under Sydney Harbour through Sydney’s CBD to Sydenham. The project will deliver eight new metro stations at;

- Crows Nest
- Victoria Cross (North Sydney)
- Barangaroo
- Martin Place
- Pitt Street
- Central Station (new underground platforms)
- Waterloo
- Sydenham

Key Project features include:

- 16km of new metro line between Chatswood and Sydenham.
- 15km of new twin rail tunnels.
- Convenient interchanges with other forms of transport including Sydney Trains, NSW Trains, light rail, buses and ferries.
- All stations will meet the needs of pedestrians, cyclists, customers catching or getting off buses and taxis, and people being dropped off and picked up in cars.
- There will be platform screen doors and all stations will be fully accessible.
- New stations designed for passenger comfort including environmentally friendly features like natural ventilation and natural lighting.



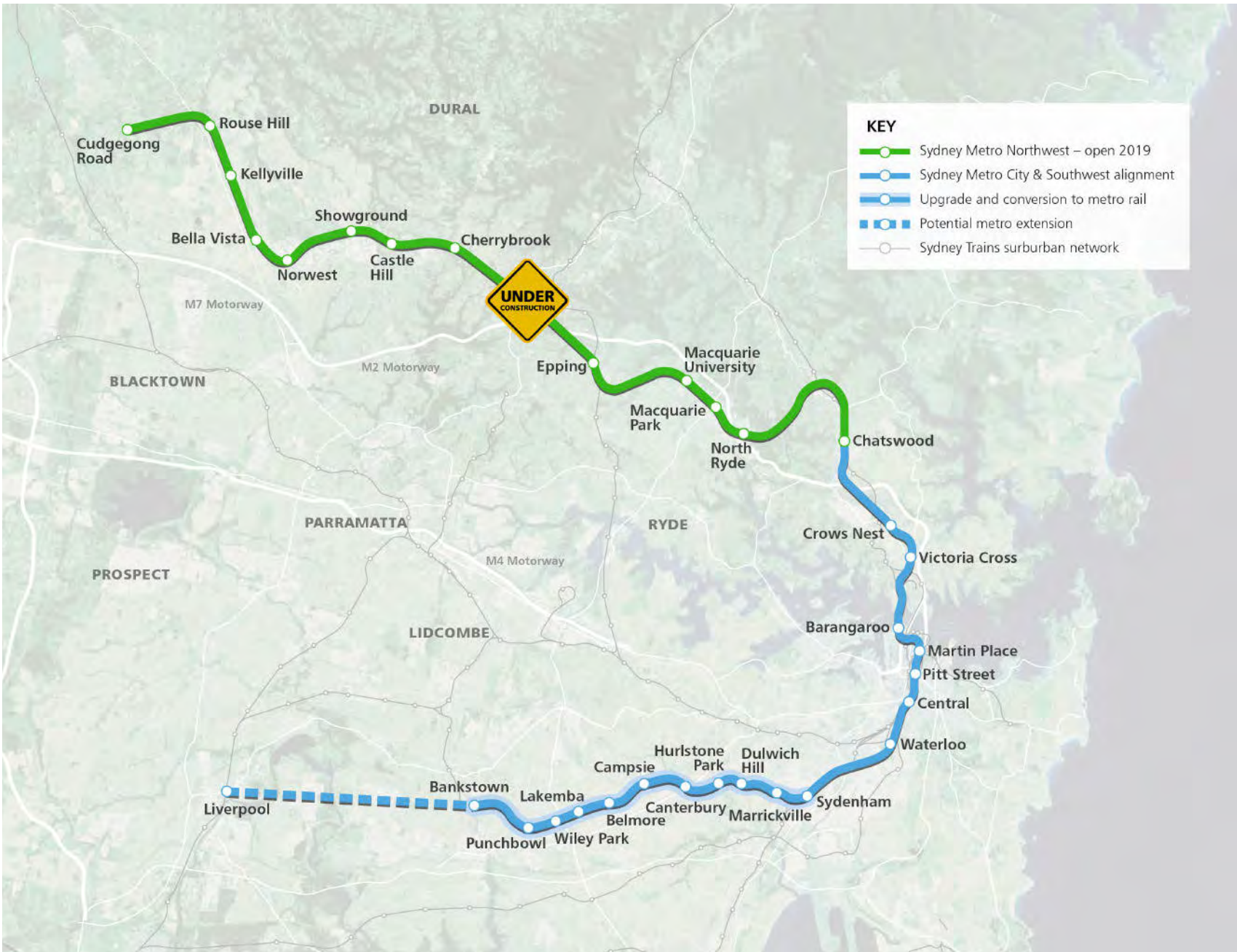
Chatswood to Sydenham alignment map

# 1.3 Project Vision

Transport for NSW’s vision for Sydney Metro is:  
**“Transforming Sydney with a new world class metro”.**

The Sydney Metro Delivery Office’s mission is to deliver a world class, connected metro, which will provide more choice to customers and opportunities for our communities now and in the future.

Sydney Metro is also a unique opportunity to demonstrate an exemplary approach to integrated transport and land use planning. Quality architecture, good urban design and a user friendly and inter-connected transport system are critical to ensuring that the Sydney Metro project meets customer needs and expectations and maximises its city shaping potential and broader urban benefits.



Sydney Metro alignment map



# 1.4 Design Objectives

To help meet the transformational vision and world class aspirations of the project, five **Design Objectives** for the project have been agreed to guide decision making and the design process for the City & Southwest project.

A **Design Principle** is prescribed under each design objective, describing the intention of the objective for the design of stations, station precincts and the wider Metro corridor:

## Objective 1: Ensuring an easy customer experience.

**Principle**  
Sydney Metro places the customer first. Stations are welcoming and intuitive with simple, uncluttered spaces that ensure a comfortable, enjoyable and safe experience for a diverse range of customers.

## Objective 2: Being part of a fully integrated transport system.

**Principle**  
Sydney Metro is a transit-oriented project that prioritises clear and legible connections with other public and active transport modes within the wider metropolitan travel network that intersect with this new spine.

## Objective 3: Being a catalyst for positive change.

**Principle**  
Sydney Metro is a landmark opportunity to regenerate and invigorate the city with new stations and associated development that engage with their precincts, raise the urban quality and enhance the overall experience of the city.

## Objective 4: Being responsive to distinct contexts and communities.

**Principle**  
Sydney Metro's identity is stronger for the unique conditions of centres and communities through which it passes. This local character is to be embraced through distinctive station architecture and public domain that is well integrated with the inherited urban fabric of existing places.

## Objective 5: Delivering an enduring and sustainable legacy for Sydney.

**Principle**  
Sydney Metro is a positive legacy for future generations. A high standard of design across the corridor, stations and station precincts, that sets a new benchmark, is vital to ensuring the longevity of the Metro system, its enduring contribution to civic life and an ability to adapt to a changing city over time.



Kings Cross Station, London UK. World class transport hub.  
Architect: John McAslan + Partners  
Source: Wikipedia

## 1.5 Understanding Customer Needs

### Customer Centred Design

At Sydney Metro we aim to serve a diverse set of customers who will undertake a number of journeys throughout the day and week using our Metro. The design and delivery of service is centred around the customer – their needs, behaviours, and jobs to be done (tasks they want to achieve using the service).

Our commitment is to deliver a reliable “door-to-door-to-door” transport solution that is surprisingly easy for all our customers by the delivery of a thoughtfully designed, seamlessly integrated experience that moves customer’ around quickly and easily and is adaptive to change. Providing services centred around the customer is key to Sydney Metro’s ongoing success and building a solid customer base.

### Our customer experience target



Sydney Metro customer experience pyramid  
Source: TfNSW

At a very basic level our customers expect us to provide a service that is on time, clean, safe, comfortable, efficient, and convenient, has the right information, and has adequate customer service. These basics are key drivers of customer satisfaction.

Our goal is to deliver a level of service that goes beyond satisfaction and makes it easy for customers’ to use the Metro and encourages repeat use across the multiple types of journeys they may make. This will endeavour to support TfNSW’s goal of increasing the number of journeys taken on public transport by the public both in the peak and off peak.

Designing for an easy customer experience is an important part of engaging customers to use Sydney Metro as part of their journey. Customers will expect more from our service over time and ease of use is the foundation for design and development of all our products, services, systems and spaces going forward.

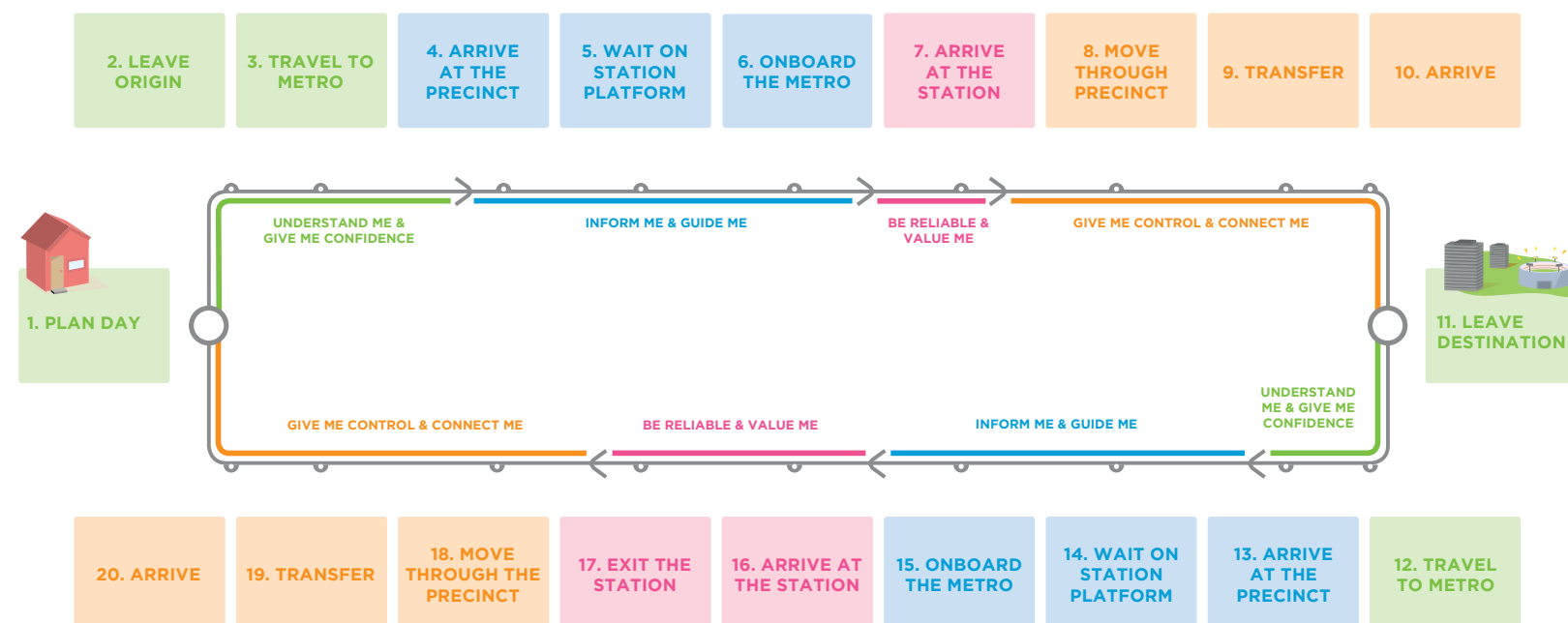
### An integrated customer journey - ‘door-to-door-to-door’

Customers see their journey from door-to-door-to-door (from origin to destination and back again) and may plan and utilise multiple travel modes throughout their journey in order to achieve their job to be done. It is critical to customers’ that their journey is seamless and well integrated across all connecting modes and that there is easy access to connect to the Metro.

A customers’ ideal journey starts at their origin when they are planning their day. At this point they decide whether they travel with us or not. The information about all our modes and connection with Metro systems and services will be key in enabling customers to make a choice to use us. If a customer cannot easily see how they can leave their origin, get to their destination and then return or do another onward journey – they are less likely to engage with us as part of their journey.

At each stage of the journey there are a number of touchpoints where the customer will interact with a TfNSW product, service, system or is interacting in one of our spaces such as a precinct or an interchange or using one of our modes. At these touchpoints we aim to make it easy to interact as well as provide consistency in service delivery and information such that it is easy for a customer to have a seamless journey from door to door to door.

The customer journey map diagram captures the touchpoints in a customers’ ideal journey door (origin – planning the day) to door (destination) to door (return to origin). Key elements that are important to customers have been noted at each touchpoint. We need to make sure that these elements are well understood so we can deliver a product and service that matches customer needs



Sydney Metro customer journey map  
Source: TfNSW

Sydney Metro Easy Customer Principles

The Sydney Metro Customer Principles are to be used to guide the design, development and operation of the services, products, systems and spaces to enable customers to have an easy customer experience. They outline:

What customers need:

- Understand Me – means demonstrating awareness and appreciation of my requirements for certainty, safety and value by providing me with easy and effective transport experiences that match my specific needs and wants.
- Give Me Confidence – means providing me with a clear appreciation for the integrated service offerings available through Sydney Metro. Assure me that throughout the journey that I can trust Sydney Metro to provide dependable, safe and secure solutions that will meet my particular needs whilst getting me to my destination in time and home again comfortably.

What the service must offer:

- Inform Me – means providing me with easy access to clear, accurate, relevant and up-to-date information at appropriate times and through convenient channels that enables me to plan my day, execute my plans and share details with others so I can easily achieve my goals with the least amount of effort, confusion and with minimal disruption.
- Guide Me – means showing me the best way to get to where I want to go, in order to get there in time, with the least amount of frustration, stress or uncertainty by directing, instructing and managing flow, crowding or impediments. It also means helping me resolve any problems or difficulties I might encounter that might negatively impact my overall experience.

How the organisation must deliver it:

- Be Reliable – means providing an effective frequency of integrated services that meet my specific needs, whilst dependably collecting and delivering me at scheduled times that enable me to successfully manage my commitments and run my life.
- Value Me – means providing effective transport solutions that I can access with the minimum amount of effort, at the right times and through convenient channels that truly respects my time. In addition, my safety, security, health and wellbeing are all considered and provided for in the way the services are delivered.

How customers want to feel:

- Give Me Control – means empowering me with the necessary knowledge and ability to make choices. It means reducing uncertainty and stress by allowing me to play an active role in managing my situation. Providing advance notice of problems with guidance and real-time updates that keep me informed gives me the freedom to update arrangements with others that may be impacted by the situation.
- Connect Me – means bringing customers closer to the people and things that are most important to them. A more effective transport solution provides a vital contribution to meeting customers’ interpersonal needs including a sense of belonging, self-esteem, friendship, love and security. Being connected is an integral enabler and a key component of the broader community experience.



Sydney Metro Customer Principles  
 Source: TfNSW



# 1.6 A Commitment to Safety

Transport for NSW is committed to ensuring Sydney Metro is designed, constructed and operated in a manner that facilitates safe working and customer passage. The project will provide facilities for customers, staff and contractors that meet or exceed any required safety standards. Sydney Metro will also comply with all relevant statutory and regulatory requirements in respect of safe system design, delivery and operation.

Safety will be considered at all stages of design across all aspects of corridor and station planning, construction, operation and maintenance. In particular, the design of Metro infrastructure in the city must provide safe interfaces between stations and the existing urban environment. The safe movement of customers, staff and contractors through station areas needs to be facilitated through many aspects of physical design, including provision of adequate platform capacity and circulation space, clear routes, adequate lighting and slip resistant flooring, as well as by minimising obstructions and eliminating crush zones.

**Station and station realm design** will identify and reflect current architectural and engineering best practice with respect to safety. Guidelines and protocols, such as CPTED, will also be important benchmarks in minimising the risks of personal harm, operational disruption and conflict.

**Construction and operational safety** will be managed through a rigorous safety in design process which will identify, develop and implement safety controls, and enhance the construction, operational and maintenance outcomes.

**Maintenance and asset management strategies** will be adopted that reduce risk through safety auditing and reporting. Sydney Metro will have a comprehensive framework to avoid or minimise risk, and to enhance safety, without unreasonably reducing amenity and functionality.



Construction of Sydney Metro Northwest.  
Source: TfNSW

## 1.7 A Commitment to Sustainability

Transport for NSW has a clear vision for Sydney Metro to achieve new benchmarks in sustainable infrastructure delivery. This means demonstrating that Sydney Metro is at the forefront of best practice, delivering environmental, social and economic improvements throughout the delivery and operational phases of the project.

This commitment is articulated through a strategic Sydney Metro objective to deliver a sustainable metro product which contributes to environmental, social and economic sustainability and the project Environment and Sustainability Policy which contains specific sustainability objectives. Sustainability objectives relevant to these design guidelines are presented in the table below.



Microclimate and customer comfort can be improved through the use of landscaping and appropriate shading.  
Source: AECOM.

Governance	Demonstrate leadership by embedding sustainability objectives into decision making
	Demonstrate a high level of performance against objectives and appropriate benchmarks
Carbon & Energy Management	Improve the shift toward lower carbon transport
	Reduce energy use and carbon emissions during operations
	Support innovative and cost effective approaches to energy efficiency, low-carbon / renewable energy sources and energy procurement
Pollution Control	Reduce sources of pollution and optimise control at source to avoid environmental harm
Climate Change Resilience	Infrastructure and operations will be resilient to the impacts of climate change
Resources - Water Efficiency	Minimise use of potable water
	Maximise opportunities for reuse of rainwater, stormwater, wastewater and groundwater
Resources - Waste & Materials	Minimise waste through the project lifecycle
	Reduce materials consumption
	Consider embodied impacts in materials selection
	Maximise beneficial reuse of spoil
Biodiversity Conservation	Protect and create biodiversity through appropriate planning, management
Heritage Conservation	Protect and promote heritage through appropriate design, planning, and management controls
Liveability	Promote improved public transport patronage by maximising connectivity and interchange capabilities
	Provide well designed stations and precincts that are comfortable, accessible, safe and attractive.
Community Benefit	Make a positive contribution to community health and well-being
	Ensure community and local stakeholder engagement and involvement in the development of the project
	Contribute to the delivery of legacy projects to benefit local communities
	Optimise community benefit of residual land development

# 1.8 Structure of the Guidelines

The Design Guidelines are structured into four sections:

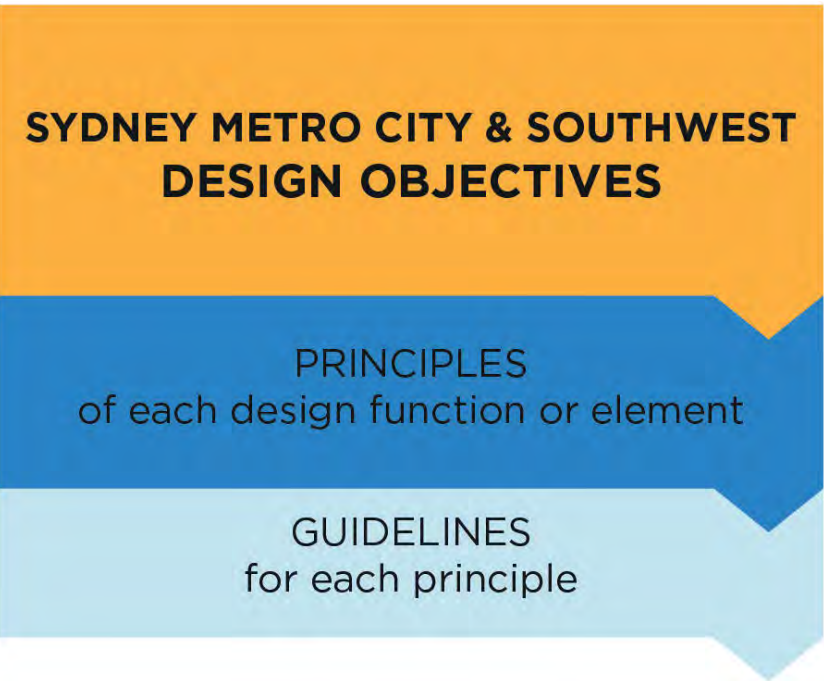
- 1. Introduction (this part)**  
Provides an overview of the Sydney Metro City & Southwest, the project objectives, design principles, an understanding of our customers' needs and the importance of design in meeting those needs.
- 2. Stations**  
Outlines the key contextual factors and design drivers that impact the design of the station and surrounding environment.
- 3. Function & Experience**  
Outlines the principles and design guidelines to be applied to the design strategies for stations and their interface with adjoining areas.
- 4. Elements**  
Outlines the principles and design guidelines to be applied to the elements of the new stations and their interface with adjoining areas.

**Document Structure**  
Sections 3 and 4 are structured to include:

**Relevant Design Objectives** - how each design guideline relates to the project Design Objectives.

**Principle** - of each design element.

**Guidelines** - describes best practice design responses that address the objective.





# 1.9 Application of the Guidelines

## Review of Design

The design of Sydney Metro is subject to ongoing internal review processes to ensure the designs are developed to respond to these Guidelines. This will ensure design quality meets the needs and expectations of Sydney Metro customers and the people of NSW. These Guidelines will be kept under review through subsequent detailed design and procurement stages to ensure that they remain up to date and relevant.

The design of Sydney Metro and implementation of these Guidelines is also subject to independent review by the Sydney Metro Design Review Panel. The objective of the Design Review Panel is to provide independent, high-level design review of the project to support the achievement of Sydney Metro project objectives and ensure quality design outcomes.

The Design Review Panel will be chaired by the NSW Government Architect and be supported by suitably qualified and appropriately skilled professionals from the fields of architecture, urban design, landscape design and heritage architecture. The Design Review Panel will be supported by specialist advisers in the fields of community integration, transport integration, sustainability and cultural heritage, as required.

These panel members will provide independent design review and advice periodically throughout the development of the design. They will maintain an ongoing review role in the design process for the project, ensuring that as the design of individual components develops, it delivers on the principles contained within this document.

## Updating the Guidelines

These Guidelines have been reviewed and updated following exhibition of the Chatswood to Sydenham EIS, in response to public and agency submissions. The Guidelines may be updated from time to time through the project delivery stage, including application of the Guidelines in relevant contracts. It is envisaged that future updates would provide additional detail and guidance as design progresses. The objectives and principles contained in this version of the document would continue to apply in subsequent versions. Updated versions of the Guidelines would be subject to the review and endorsement of the Design Review Panel.



Artists rendering of Waterloo station.  
Source: TfNSW





## Stations

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## About this Section

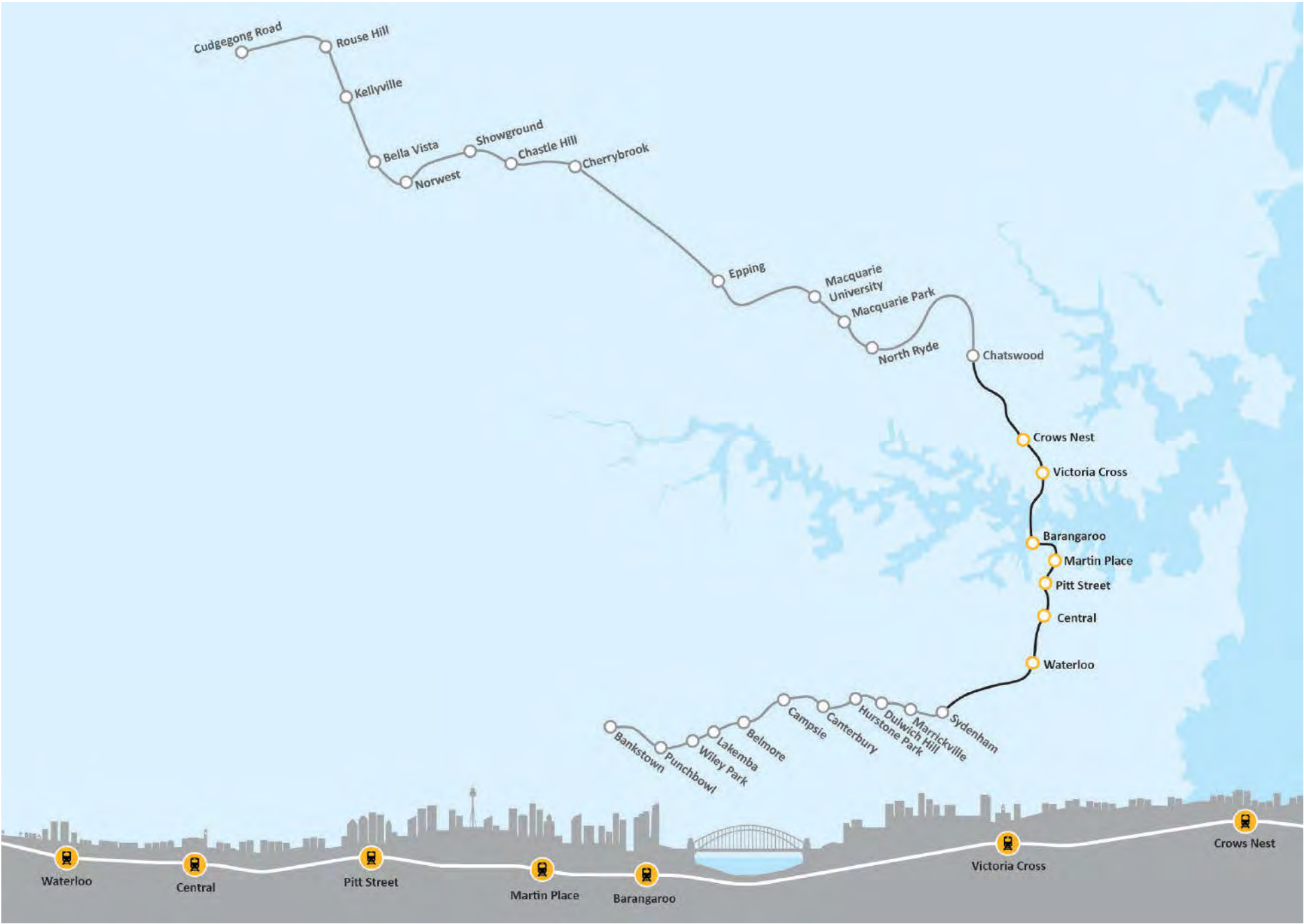
This section describes the context and functional character of the Metro stations. It acknowledges the existing conditions and urban interfaces of each station in order to inform the delivery of contextually responsive and integrated environmental outcomes.

The urban and public domain design must be developed with reference to the existing urban context and infrastructure (including built form and public domain conditions, landscape elements and existing and proposed services) as well as planned initiatives in the locality.

New metro stations are proposed at:

- Crows Nest
- Victoria Cross (North Sydney)
- Barangaroo
- Martin Place
- Pitt St
- Central Station (new underground platforms)
- Waterloo
- Sydenham.

Key descriptors for each station are noted in this section including; centre type, primary function (e.g. origin/destination), catchment type, and Local Government Area. An outline of the transport role and function and geographical catchment of each station, including the key design drivers for the station precinct, are also set out in the following pages.



Sydney Metro alignment map



## 2.1 Crows Nest

**Centre type:** Strategic centre

**Primary Function:** Origin and Destination

**Catchment:** Commercial, residential, leisure

**Local Government Area:** North Sydney

### Context

Crows Nest Station would be located on the western fringe of the Crows Nest village. Access to the station would be from the corner of Clarke and Hume Streets and from the corner of Oxley Street and Pacific Highway.

Crows Nest Station would support the St Leonards strategic centre as a southern gateway to commercial and mixed use activities. The station would also improve access to the restaurants and specialist shops in the Crows Nest village.

Convenient and legible links to employment and mixed use developments around Atchison and Chandos Streets are important aspects of the station context. Oxley Street is important in the urban structure as a north-south link that is relatively level and has good sight lines.

The station would provide access to a new transport mode for the surrounding residential areas. This includes the lower scale Holtermann Estate to the east and medium density and multi-unit developments on the western side of the Pacific Highway.

A service building would be located above the station box on the Pacific Highway. The station design would enable development to be built above the station with frontage to the Pacific Highway.

### Key design drivers:

- Create a new transport focus on the southern side of the St Leonards strategic centre.
- Maximise legibility and connectivity with the local urban structure.
- Integrate the station with local improvement plans and make a positive contribution to the sense of place.



Clarke/Hume Streets, Crows Nest.  
Source: Cox Richardson



Clarke Street, Crows Nest  
Source: Cox Richardson



Willoughby Road, Crows Nest  
Source: Cox Richardson



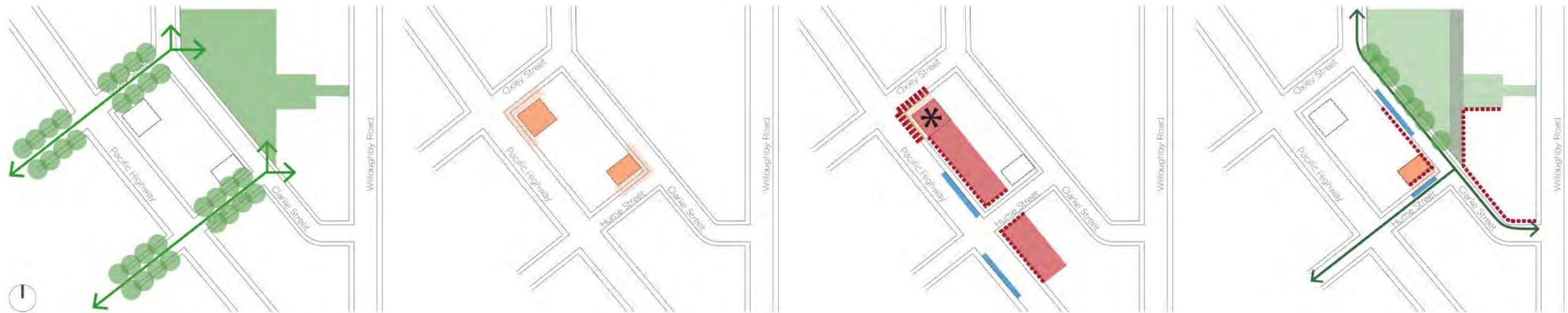
Crows Nest Community Centre  
Source: Cox Richardson





Crows Nest Station Design Drivers





## Urban Design Strategies

### Green Streets

Oxley and Hume Streets are important east-west links in the urban structure.

Crows Nest Station is an opportunity to enhance the amenity and green character of Oxley Street and Hume Street. This could include enhanced pedestrian space, paving upgrades and street trees.

### Visible and integrated entries

The placement of entries on corners maximises their visibility from multiple vantage points.

There is an opportunity to create a seamless entry experience into the station through materiality and extending the character of the surrounding public domain into the station.

### A Pacific Highway landmark

Sydney Metro provides an opportunity for a strong architectural presence along the Pacific Highway. The station entry on the corner of Pacific Highway and Oxley Street can anchor this presence.

The station and associated development above has the opportunity to create a consistent built edge along Pacific Highway, aligned with existing buildings and maximising activation at ground level.

Interchange with buses on the corner of Hume Street reinforces the importance of the metro station on this major transport spine.

### Supporting the vision for Crows Nest Village

Sydney Metro will integrate with the vision for the Crows Nest Village including the planned upgrades to Hume Street Park, Clarke and Hume Streets by North Sydney Council, and connectivity to renewal areas to the north.

The Sydney Metro entry on the corner of Hume and Clarke Streets directly addresses cycle, kiss and ride and taxi access including improved pedestrian crossing of Clarke Street.

This station entry will be scaled to reflect the local fine grained character of the area and accommodate new and existing active transport links.



# 2.2 Victoria Cross

**Centre type:** Global Sydney (North Sydney CBD)

**Primary Function:** Destination

**Catchment:** Commercial, residential, education

**Local Government Area:** North Sydney

## Context

Victoria Cross Station would be located in the northern section of the North Sydney CBD. Access to the station would be from the east side of Miller Street between Berry and Mount Streets.

The Victoria Cross Metro station would support the continued growth of the North Sydney CBD as an integral part of Global Sydney. The new station would improve customer experience at the existing North Sydney Station by relieving demand in peak times.

The North Sydney CBD is characterised by multi-storey commercial developments. A number of educational facilities including high schools and an Australian Catholic University campus are located on the north and western edges of the North Sydney CBD. The area north of Berry Street includes residential and mixed use developments.

The station design would enable development to be built above the station. The future development would have frontage to Miller and Berry Streets.

## Key design drivers:

- Create a new transport focus in the North Sydney CBD.
- Contribute to the attractiveness of the North Sydney CBD by adding to and integrating with the public domain.
- Improve the permeability of the immediate station context.



Miller Street, North Sydney  
Source: Cox Richardson



Miller Street, North Sydney  
Source: Cox Richardson



Entrance to North Sydney station at Brett Whiteley Place  
Source: Cox Richardson

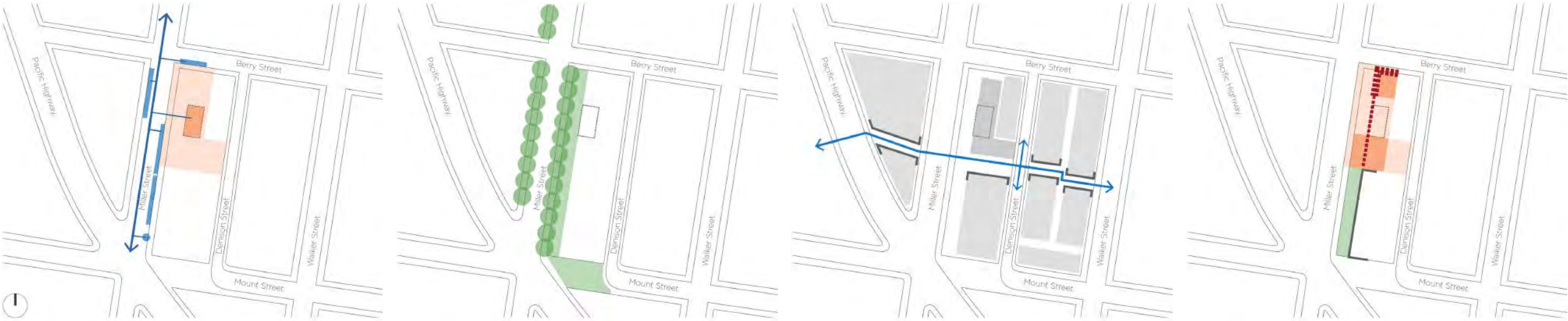


Artist rendering of planned Brett Whiteley Place  
Source: North Sydney Times





Victoria Cross Station Design Drivers



Urban Design Strategies

A Public Interchange Place

Miller Street is North Sydney’s civic street and an important thoroughfare. This new metro station reinforces the transport function of Miller Street, creating a generous “interchange place”.

This place allows for safe and equitable movement between different modes (especially Metro and rail, bus and taxi).

The Miller Street Green Avenue

The landscape character of Miller Street is extended (by new trees further south along this street) and expanded (into the new interchange place in front of the station).

This avenue will provide pedestrian amenity along the length of the block as well as within smaller pockets of activity, including areas for dining, sitting and relaxing. Miller Street will become the main civic space for North Sydney

Mid-Block Connectivity and Access

Metro provides an opportunity to break down the north-south oriented blocks of North Sydney with new east-west pedestrian connections.

This finer grain block structure opens up opportunities to upgrade laneways such as Denison Street to enable greater pedestrian connectivity.

A Focal Point for North Sydney

The Sydney Metro station creates a focus for development and renewal in North Sydney, creating a generous public space and major transport node, as well as the potential for a significant tower development over the station.

There is an opportunity to focus activity on the corner of Miller and Berry Streets, in addition to enhancing the character and pedestrian amenity of Denison Street.



## 2.3 Barangaroo

**Centre type:** Global Sydney (Sydney CBD)

**Primary Function:** Destination

**Catchment:** Commercial, visitor (recreation)

**Planning Authority:** Minister for Planning

### Context

Barangaroo Station would be located on the western side of the Sydney CBD within the Barangaroo Central precinct. Access to the station would be from within the Barangaroo Central development and Barangaroo Reserve.

The Barangaroo station would improve accessibility to Barangaroo and to the Walsh Bay Arts and Culture precinct.

The Barangaroo precinct includes office, retail, residential uses and a new casino, hotel and apartment complex. Barangaroo Central will combine civic and cultural attractions with recreational, retail and commercial uses. At the north end Barangaroo Reserve includes Headland Park, a major new waterfront public open space and new cultural centre hosting events. Barangaroo South will be home to three significant new employment towers.

### Key design drivers:

- Maximise connectivity and legibility to the primary uses within and near the Barangaroo precinct including the Walsh Bay Arts and Culture precinct.
- Ensure legible and direct access to Barangaroo Reserve and surrounding development.
- Integrate with the development plans for Barangaroo.



Barangaroo Master Plan  
Source: Barangaroo South



Barangaroo South under construction & Headland Park  
Source: Cox Richardson

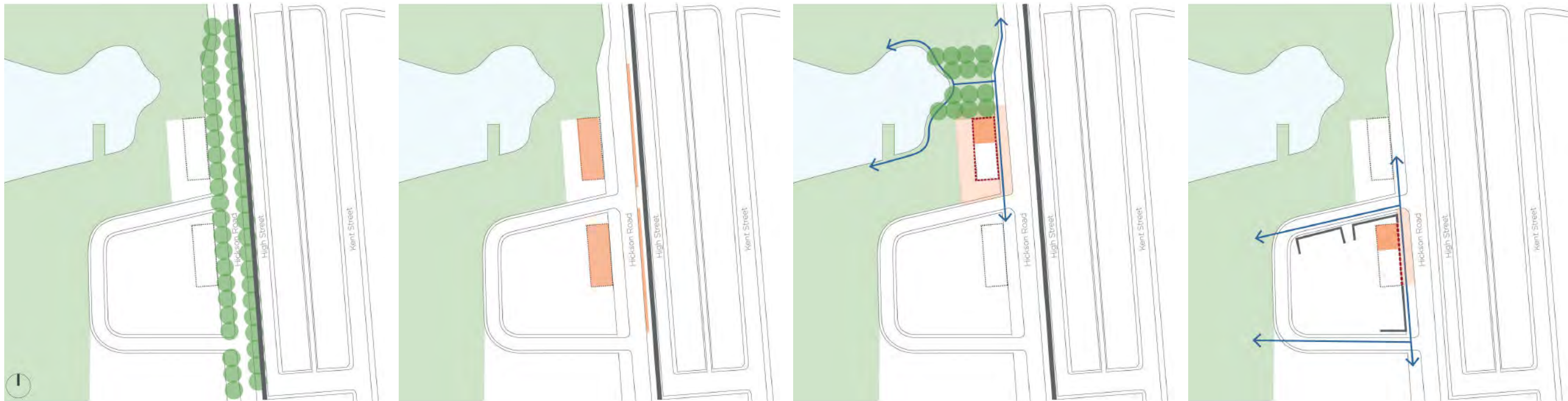


Walsh Bay Arts & Culture Precinct  
Source: Timeout Sydney





Barangaroo Station Design Drivers



### Urban Design Strategies

#### Hickson Road Heritage

The historic street of Hickson Road will become one of Sydney's premier boulevards, with street trees, landscaped median and generous footpaths. The entries to the Metro station will address Hickson Road.

The following principles apply to Hickson Road:

- Provide an exemplary streetscape design integrating station infrastructure, with heritage, street access and circulation, pedestrian amenity, safety and security
- Allow for high quality and safe pedestrian access along both sides of Hickson Road
- Integrate a contemporary urban art program and heritage interpretation strategy (including archaeology) as part of the station and streetscape improvement works
- Maximise consistency with the City of Sydney strategies

#### Infrastructure Integrated into Streetscape

Station infrastructure will be integrated into the eastern edge of Hickson Road. To minimise visual and physical obstruction, the following principles guide the design:

- Consolidate the number of station infrastructure and street elements to achieve a balance between efficiency and visual amenity
- Minimise the height, length and width of station infrastructure in the streetscape
- Locate station infrastructure away from view corridors (eg from the harbourside park between buildings) and from areas of open space (eg adjacent to the Northern Cove)
- Station infrastructure will not be above ground level whenever possible

#### Entry Pavilion on the Park

The northern entry to the Sydney Metro station will be located within the existing park adjacent to the Northern Cove of Barangaroo.

To ensure visual and physical connectivity between Hickson Road and the harbour, this entry will be minimally scaled and highly transparent.

#### Entry Embedded in New Development

The southern entry of the Sydney Metro station will be integrated into the future built form of Central Barangaroo, creating a consistent and activated street edge to Hickson Road and reducing the impact of any associated services.



# 2.4 Martin Place

**Centre type:** Global Sydney (Sydney CBD)

**Primary Function:** Destination and interchange (rail)

**Catchment:** Commercial, retail, civic

**Local Government Area:** City of Sydney

## Context

Martin Place Station would be located between Elizabeth Street, Hunter Street, Castlereagh Street and Martin Place. Access to the station would be from Hunter, Castlereagh and Elizabeth Streets and from Martin Place.

The station would serve Sydney's high-end commercial and financial district, the Macquarie Street civic precinct and the Pitt Street retail zone. A key function of the Metro station would be to facilitate interchange with the existing Eastern Suburbs and Illawarra line platforms at Martin Place station.

Connection to Martin Place is an important aspect of the station's context. Martin Place is one of Sydney's most recognisable civic and public spaces and a primary east-west pedestrian corridor in the city centre.

The design would enable development to be built above the station at Hunter Street and on the south side of Martin Place.

## Key design drivers:

- Reflect the significance of Martin Place and status of the station by designing clear, legible, iconic, integrated entries.
- Provide generous space for customers in a busy pedestrian environment by extending the public domain into the station entries.
- Efficient interchange in the centre of the Sydney CBD through convenient, direct connections to the existing Eastern Suburbs and Illawarra line train platforms.
- Integrate with public domain and transport access improvements.



Hunter Street  
Source: Cox Richardson



9 Castlereagh St, Sydney. The public domain is extended within the building's site.  
Source: Cox Richardson



Martin Place  
Source: TfNSW





Martin Place Station Design Drivers





**Urban Design Strategies**

**Supporting the City’s Public Domain Strategies**  
The City of Sydney’s master plan for the renewal of Martin Place sets a strategic framework for the works at Martin Place.

Sydney Metro can support this plan through the enhancement and activation of the public domain.

**Entries as New Public Spaces**  
The new station entries are visually prominent and envisaged as generous “urban rooms”.  
  
Extending the materiality and character of the public domain into the station creates the opportunity for a seamless experience.

**Flagship Developments Over Stations**  
The entrances to the station provide an opportunity for renewal. Future development above these spaces should sensitively respond to the established built form and positively enhance the locality by providing high quality architecture and complementing the streetscape.

**Direct and Legible Interchange**  
The new Metro station is integrated with the existing Martin Place rail station, allowing for direct subsurface interchange.  
  
Bus stops are located on Castlereagh and Elizabeth Streets, as close as possible to station entries with Martin Place and Hunter Street acting as key connectors to these stops.



## 2.5 Pitt Street

**Centre type:** Global Sydney (Sydney CBD)

**Primary Function:** Destination

**Catchment:** Commercial, retail, residential, civic

**Local Government Area:** City of Sydney

### Context

Pitt Street Station is located in the centre of Sydney CBD within the Town Hall civic precinct. Two entries are proposed - a northern entry on the north side of Park Street to the east of Pitt Street and a southern entry on the south side of Bathurst Street to the east of Pitt Street.

Pitt Street Station would serve the retail centre of the Sydney CBD on George and Pitt Streets north and west of the station, the civic and entertainment uses on George Street south and west and the emerging southern CBD residential developments between Park Street and Belmore Park.

The station would facilitate interchange with Light Rail on George Street and buses on the key corridors along Park, Elizabeth and Castlereagh Streets.

The station design would enable development to be built above the station entries.

### Key design drivers:

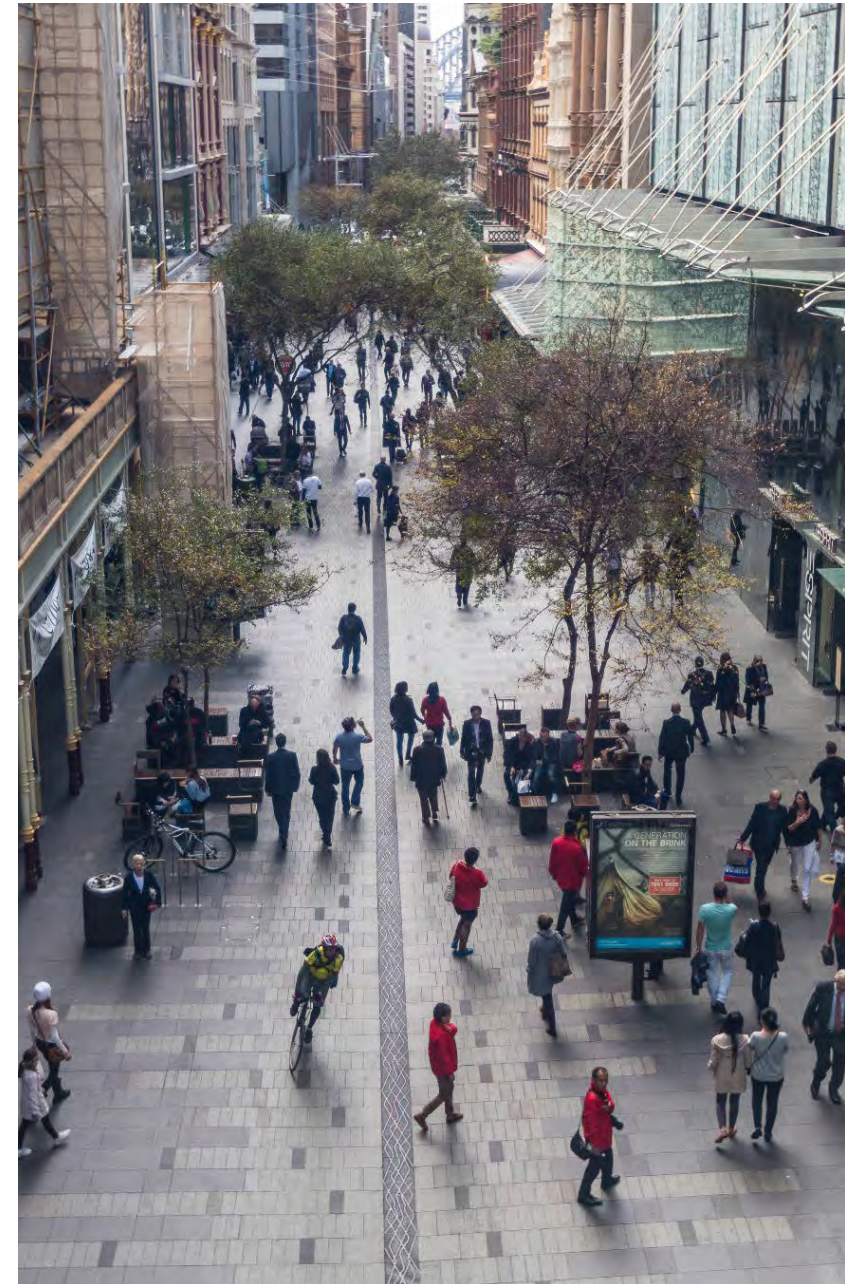
- Provide space for customers in a busy pedestrian environment by extending the public domain into the station entries.
- Integrate with the Sydney City Centre Access Strategy and other CBD planning.
- Anticipate connections to a future Town Hall Square and other nearby developments
- Extend the transport focus along Park Street, near Pitt Street.



Sydney Light Rail, George Street.  
Source: TfNSW



Park Street  
Source: TfNSW



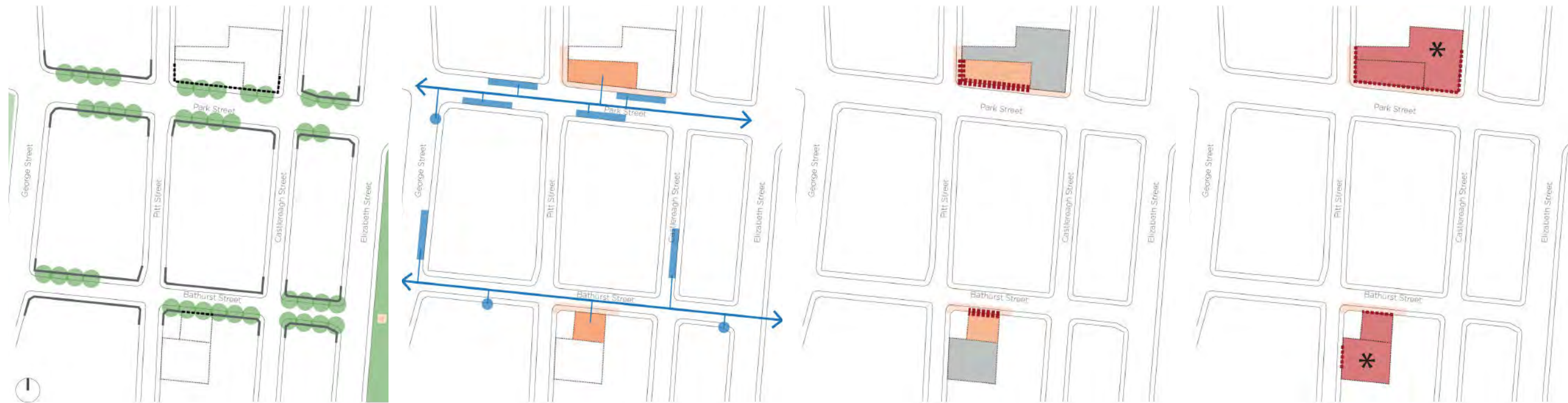
Pitt Street Mall  
Source: TfNSW





Pitt Street Station Design Drivers





### Urban Design Strategies

#### Linking Hyde Park to the Civic Precinct

Park and Bathurst Streets are key east-west connectors in the Sydney city centre, linking the harbour (at Darling Harbour) and green space (Hyde Park) on the edges of the city. These streets run through the heart of the city's civic precinct, which contains Sydney Town Hall, St Andrews Cathedral and the Queen Victoria Building (as well as the planned Town Hall Square).

As increasingly important pedestrian streets, Park Street and Bathurst Street will require public domain improvements.

#### A Street-grid of Interchange

The new Sydney Metro station will be located within a network of public transport services spread over several street blocks. These services include rail (Town Hall and Museum stations), bus (primarily along Park, Castlereagh and Elizabeth Streets) and future light rail along George Street.

The entrances to the new Metro station address Park and Bathurst Streets. These two streets will be key to interchange movements, especially to the bus and light rail services that run along the north-south streets of the city.

#### Frontages to east-west streets

The primary address of both Metro entries will be to the east-west connectors, reinforcing the importance of these streets and facilitating interchange between transport modes.

Extending the materiality and character of the surrounding public domain into the station entries creates the opportunity for a seamless experience.

#### Optimising development over stations

The entrances to the station provide an opportunity to facilitate renewal. Future development above these spaces should reflect the context of the locality and positively contribute to the built form and character of the area.



## 2.6 Central

**Centre type:** Global Sydney (Sydney CBD)

**Primary Function:** Destination and interchange (intercity and suburban rail/bus/light rail/coach services/taxis)

**Catchment:** Commercial, education

**Local Government Area:** City of Sydney

### Context

The proposed Central Metro Station would be located within the existing Central Station precinct. Access would be from upgraded entries at Eddy Avenue, Chalmers Street and the western forecourt.

The station would have a major interchange role with suburban and intercity trains, light rail, buses and coaches.

Central Station would provide access to retail and mixed use precincts in the locality including Haymarket, Chinatown, Central Park and Surry Hills and to educational facilities including the University of Technology Sydney, the University of Notre Dame, Australia and Sydney Institute of Technology.

### Key design drivers:

- Provide an efficient and high quality interchange for customers to connect to other public transport services.
- Respect the heritage significance of the Central Station precinct.
- Integrate with the Sydney City Centre Sydney Access Strategy and Central Station Precinct Plan.
- Support connectivity with major land uses and developments in the locality.



Central Station, view over suburban/city platforms  
Source: TfNSW



Railway Square. Central Station is a major interchange place  
Source: Cox Richardson



Central Station precinct. View over Railway Square looking south.  
Source: TfNSW

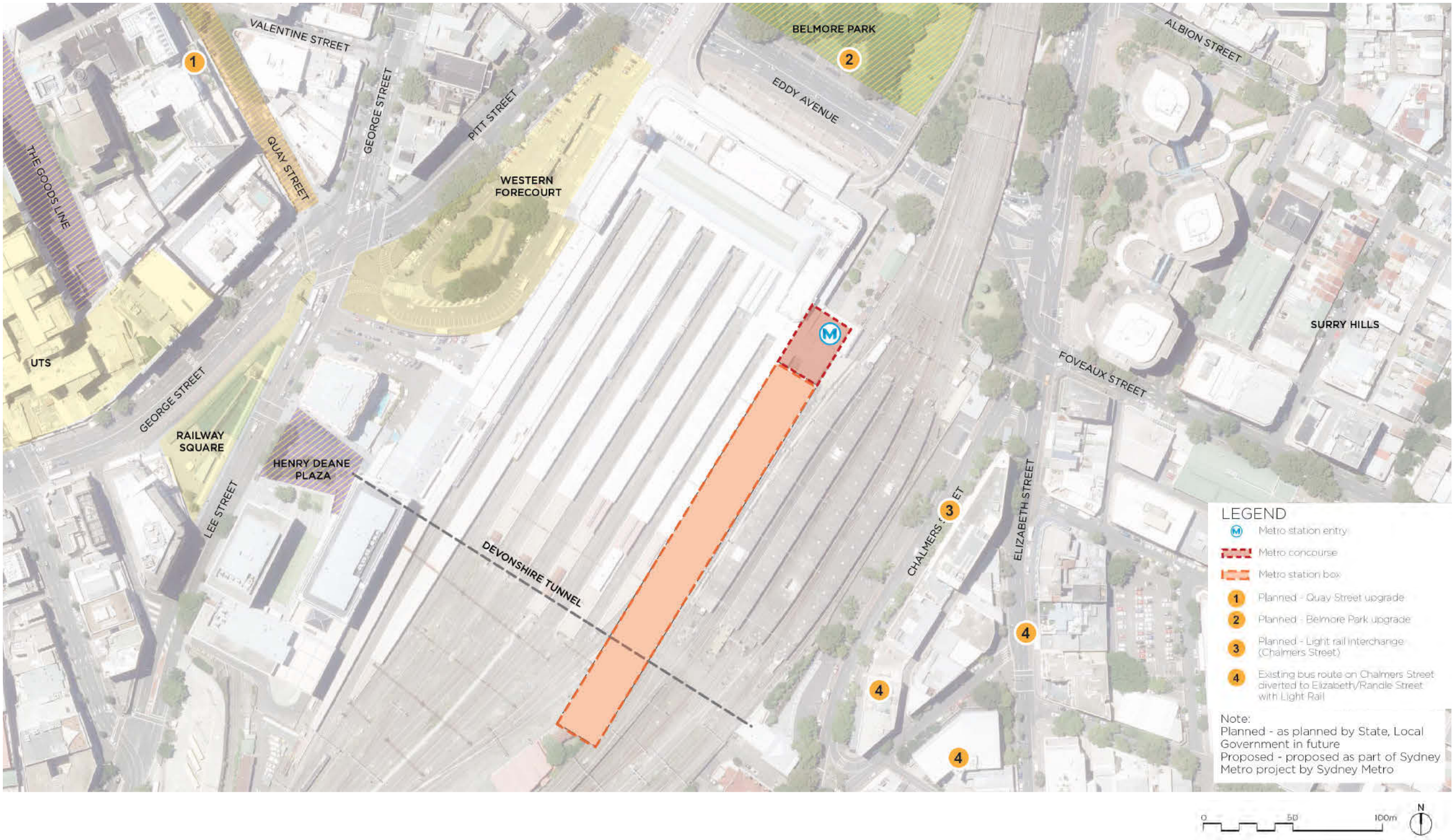
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Central Station Design Drivers



# 2.7 Waterloo

**Centre type:** Global Sydney (Sydney CBD)

**Primary Function:** Origin

**Catchment:** Residential

**Local Government Area:** City of Sydney

**Context**

The proposed Waterloo Station would be located between Botany Road and the Land and Housing Corporation landholdings in Waterloo.

A Waterloo Station would provide the opportunity to catalyse the development and urban renewal of the Land and Housing Corporation landholdings, connect the Australian Technology Park and the residents in the Waterloo/Redfern area with Sydney Metro.

The station design would enable development to be built above the station.

**Key design drivers:**

- Contribute to the sense of place and public domain.
- Create a new transport focus in Waterloo.
- Integrate the station with local improvement plans and make a positive contribution to the regeneration of this new urban community.



Botany Road, Waterloo  
Source: Cox Richardson



Land and Housing Corporation site with Sydney CBD beyond.  
Source: Cox Richardson



Raglan Street, Waterloo  
Source: TfNSW



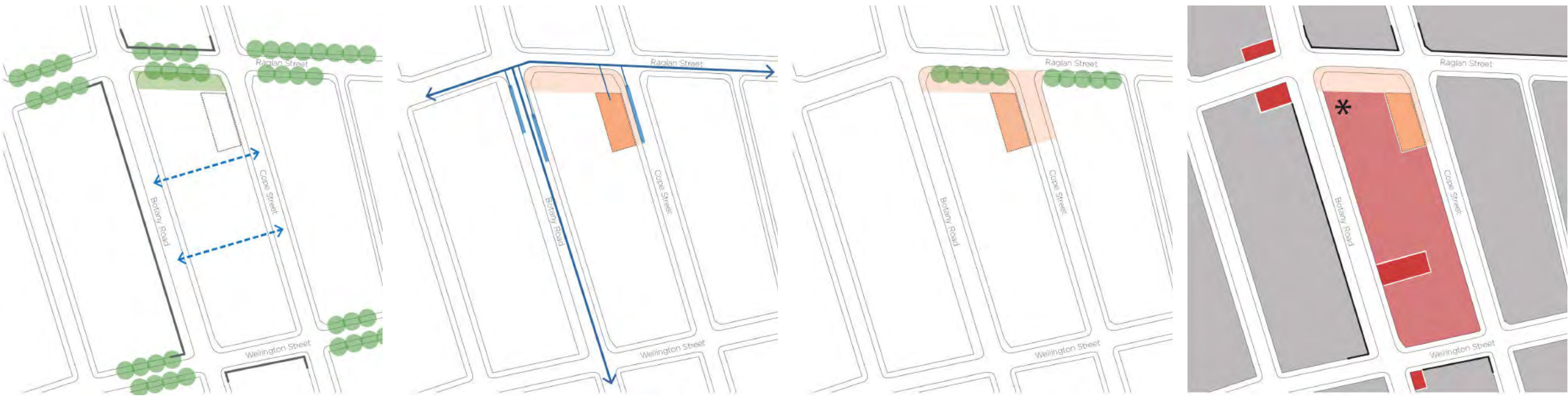
Artists Impression of Raglan Street, Waterloo  
Source: UrbanGrowth NSW





Waterloo Station Design Drivers





Urban Design Strategies

Enhancing East-West Permeability

As the north-south streets of Waterloo (including Regent, Botany and Gibbons) Streets carry significant vehicular movement, east-west streets have greater potential for walking and cycling access. Raglan and Henderson Streets will become a key connector between the new Sydney Metro station, the Australian Technology Park and residential renewal areas to the east.

Opportunities for mid-block connections would enhance pedestrian connectivity and activity around the station site, breaking down the long street block bounded by Raglan and Wellington Streets.

Interchange Close to Station Entry

A number of bus routes run adjacent to the Sydney Metro station, with interchange (to stops on Botany Road, Henderson and Raglan Streets) on the southern side of Raglan Street. The location of bus stops on Botany Road may need to be reviewed to maximise connectivity with the station entry.

There are opportunities for safe and convenient access by cycles, taxi and drop-off to the station entrance from Cope Street.

Public Domain Defined and Activated

The new Metro station provides an opportunity to maximise connectivity, create activity and support growing residential populations through a network of high quality public spaces around the station. This would include spaces for customers to transfer between modes and upgrades to the pedestrian environment along major streets and any new laneway connections between Cope Street and Botany Road.

Support Renewal around the Station

The Metro station will support significant renewal in Waterloo and surrounding residential, commercial and industrial areas.

New buildings and spaces should contribute positively to the surrounding context by enhancing and integrating with existing heritage buildings, creating permeability through smaller development lots, delivering public spaces and public infrastructure, and considering issues of solar access, visual impact and acoustic privacy.

## 2.8 Sydenham

**Centre type:** Local Centre

**Primary Function:** Origin and Interchange

**Catchment:** Residential and light industrial

**Local Government Area:** Inner West Council

### Context

Sydenham Station lies approximately 6km south of the Sydney CBD within the Inner West Council (formerly Marrickville) Local Government Area. The suburb is bounded by St Peters to the east, Marrickville to the west, Enmore to the north and Tempe to the south.

Land use around the station is mixed, with low density residential as well as commercial and industrial areas to the south that generally date from the late 19th century and early 20th century, and later industrial areas to the north.

Sydenham is only two kilometres from Kingsford-Smith Airport and lies directly under the flight path.

Railway Parade and Gleeson Avenue border the station and, with Sydenham and Marrickville Roads, form an important north-south connection for both general traffic and heavy vehicles. Burrows Avenue on the southern edge of the station is a busy local road. There are three high amenity recreational reserves within walking distance of the station: Fraser Park, Sydenham Green and Tillman Park.

### Key design drivers:

- Additional station concourse at Sydenham that caters for the forecast patronage demand and facilitates interchange between Sydney Trains and Metro services
- Deliver an unpaid cross-corridor connection, creating a safe, local pedestrian link from the residential area in the south to the employment and retail areas of Marrickville to the north
- Provide accessible interchange currently missing at Sydenham Station with new entry plazas
- Improve connectivity across the railway corridor



Sydenham Station entry, Gleeson Avenue  
Source: COX/HASSELL



Street art on Marrickville Road, Sydenham  
Source: COX/HASSELL

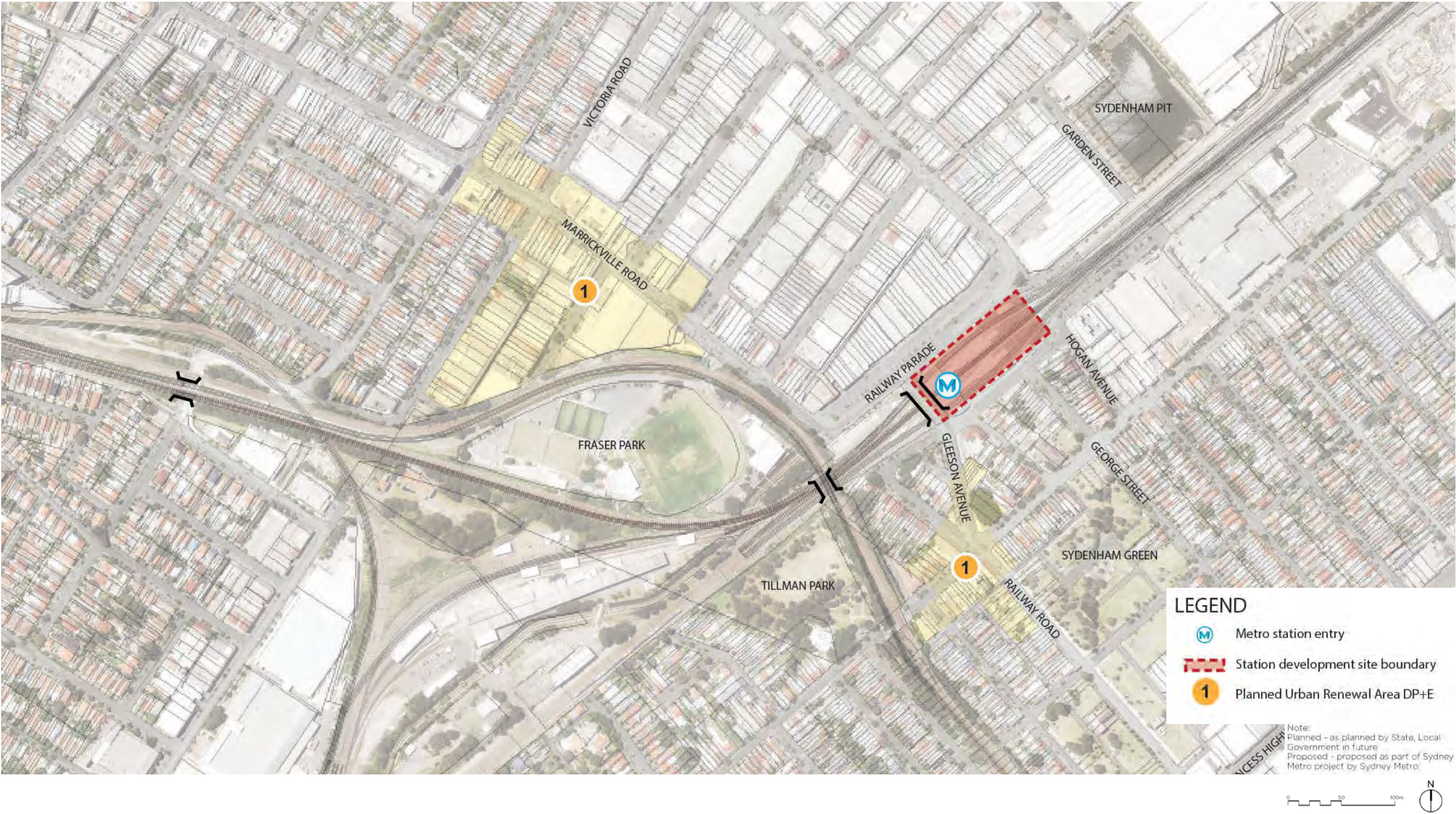


Sydenham Station platforms  
Source: COX/HASSELL



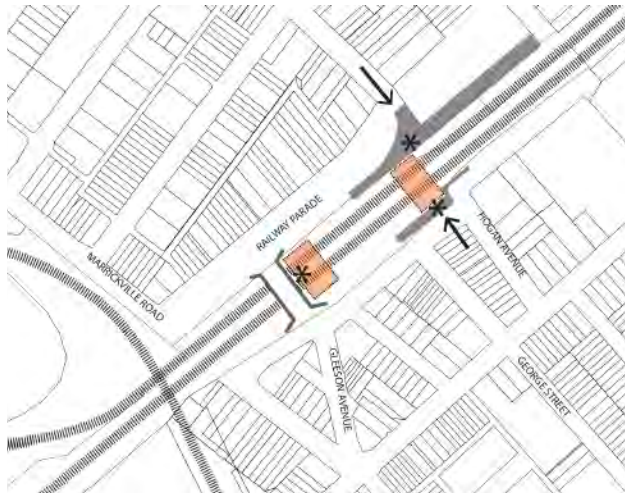
Sydenham Stormwater Storage Pit  
Source: COX/HASSELL





Sydenham Station Design Drivers





## Urban Design Strategies

### Address and Legibility

- Sydenham Station suffers from poor physical and visual connections to the north and south. Blank walls and facades and generally limited visibility restrict legibility of the station from adjacent areas.
- A second station entry and distinctive Metro canopy will open the station up and make it clearly visible from Sydenham Road in the north and local streets to the south.

### Precinct Connectivity

- The station concourse at the eastern end of the station will provide an important cross-corridor link between Sydenham Road, and neighbourhood streets and Sydenham Green in the south.

### Accessible Interchange

- Modifications to Railway Parade including a pedestrian crossing will provide a safe and accessible bus stop adjacent to the northern station entry for southbound bus services.
- An interchange zone on Burrows Avenue will serve northbound bus services and tax and kiss and ride requirements.
- Secure and sheltered bicycle parking will be located in north and south station plazas.

### Public Space and Heritage

- Proposed plazas will widen the public domain at station entries and generally improve pedestrian amenity and safety.
- New street trees, interchange shelters and furniture will enhance the customer arrival and interchange experience.
- Improve public domain along the northern side of the station between Railway Parade and Garden Street, accommodating pedestrians, cyclists and facilitating retail opportunities
- Proposed aerial concourse will provide new views across the station platform buildings which have significant heritage value.



## Function & Experience

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## About this Section

This section provides guidelines for the spatial and functional design of the urban and public domain in each station precinct, as well as the urban form of associated project development. The guidelines are articulated according to a number of core design strategies that guide the planning and design of Metro stations and their precincts. The strategies are grouped under the following family headings:

- Designing for Customers
- Identity
- Connectivity
- Development Opportunities

More detailed design guidelines and key requirements for each of these strategies will be included in the scope and performance documents during the procurement stage.



Chatswood Transport Interchange. Interchange places should be active public spaces that support a range of amenities for all users.  
Architect: CoxDesignInc.  
Source: COX Richardson, Photographer: John Gollings



# 3.1 An Easy Customer Experience

An easy customer experience is central to all aspects of the Sydney Metro design. A high quality customer transport product across the whole ‘door-to-door’ customer journey is critical to the customer experience. Sydney Metro will be a fast, safe, reliable, easy service for all customers.

Sydney Metro will cater to all customers including daily commuters, people with disabilities, families, visitors to Sydney and infrequent users.

The key public transport customer service design principles which underpin customer focused design are provided below.

This part of the document provides guidelines for the following areas of the customer experience:

- Customer Centred Design
- Customer Circulation
- Wayfinding and Legibility
- Customer Safety
- Comfort and Amenity
- Accessibility



Provide an easy experience for a diverse range of customers.  
Source: TfNSW

## Public transport customer service design principles

**Balanced:** Functional performance is balanced with customer service to achieve high levels of customer satisfaction.

**Efficient, assisted service:** A self-service system that is designed for easy, intuitive use. Where assistance may be required, support is available and easy to get.

**Universally accessible:** Meet the needs of all members of the community, accommodate the distinct needs of key customer segments.

**Flexible:** Able to adapt to a range of typical usage patterns and services while delivering a consistent level of service outcomes.

**Legible and consistent:** Reflect a service style and tone that is easily understood and consistent with the experience of an integrated transport system.

**Responsive:** A service system open to feedback from customers, that adjusts over time as needs and preferences change, and continuously improves.



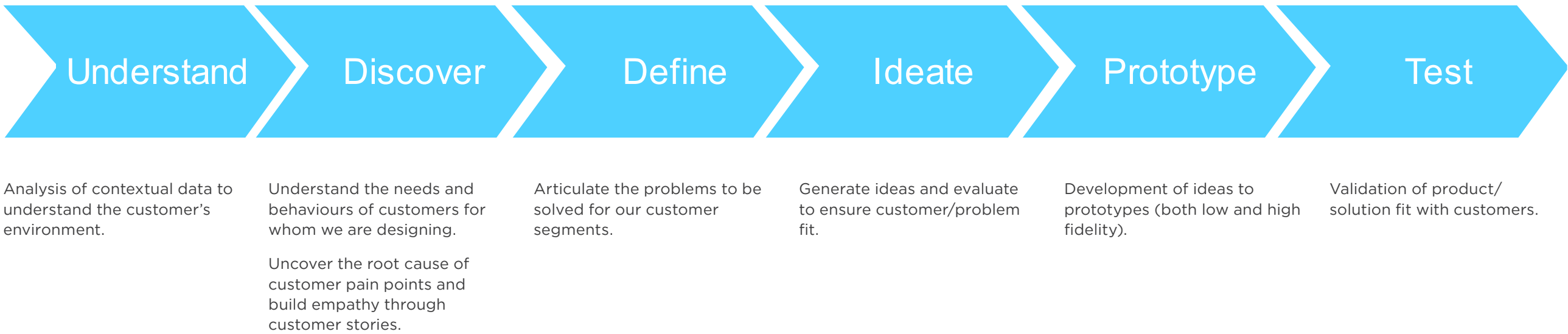
### 3.1.1 Customer Centred Design

**Relevant Design Objectives**

1	Ensuring an easy customer experience
---	--------------------------------------

**Principle**

*Customer Centred Design (CCD) is the process that brings the 'customer to the centre of everything we do'.*



3.1.2 Customer Circulation

Relevant Design Objectives

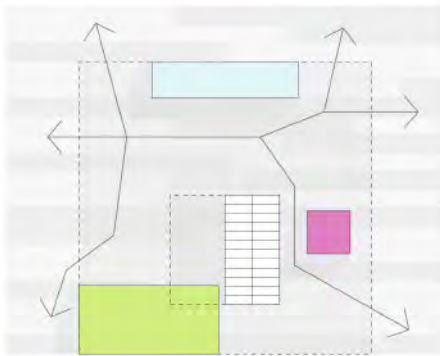
- 1 Ensuring an easy customer experience

Principle

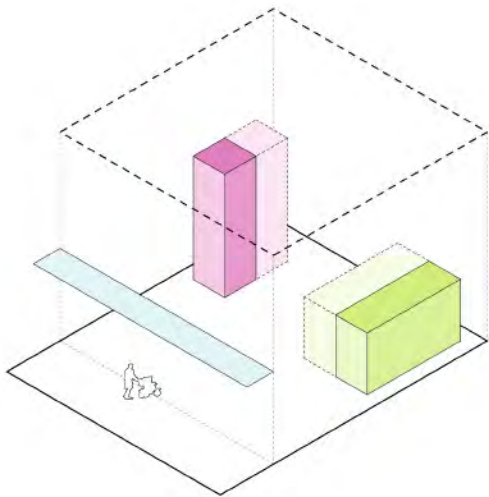
*Provide adequate space to meet customer demands, including during peak periods and long-term patronage demands.*

Guidelines

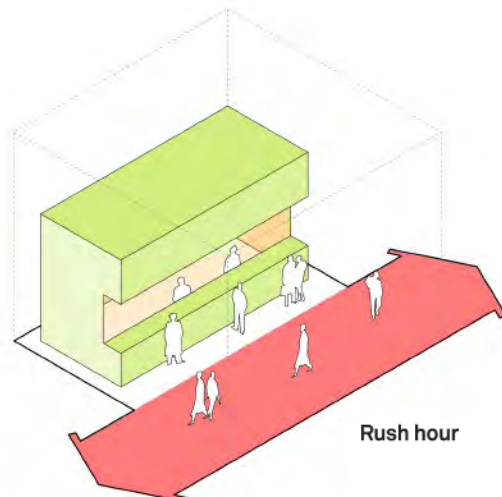
- Each part supports a different range of functions that must be addressed on station opening and in future scenarios.
- The movement capacity, configuration and spatial sequences of each of the Sydney Metro stations is to respond to patronage requirements as defined by a Level of Service (LOS) appropriate to the location and context.
- Pedestrian paths, crossings and spaces adjacent to Sydney Metro stations are to have sufficient capacity to meet potential demand with particular consideration of key decision points (gatelines, entrances, exits, customer queue zones) and information points. Where constrained, this may be met by extending the public domain into the station forecourt.
- The customer circulation paths within the station are to optimise timeliness for customers moving between concourse, platform, and station entries.
- Circulation paths are to be designed for convenience of connections into the station and from surrounding areas and other transport modes. These should reflect pedestrian desire lines as much as possible to enhance the convenience of circulation routes.
- Ancillary development and activities (retail, commercial or residential development, services areas and advertising structures) within Sydney Metro station sites are not to compromise efficient transport operations.
- All areas are to provide sufficient space for emergency access and movements in accordance with relevant design standards and legislation.



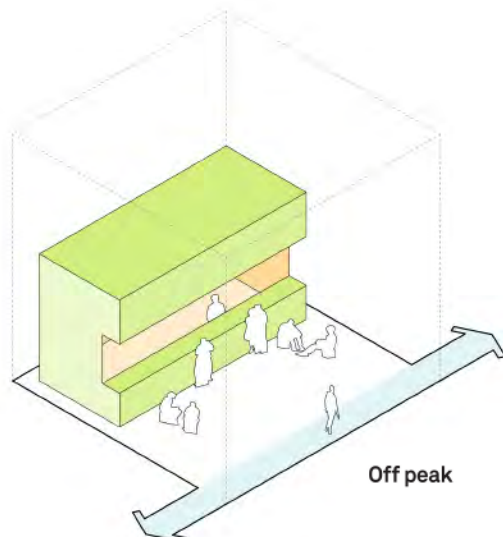
Station elements located to optimise permeability.



The effective space around each element can vary with the changing customer circulation requirements throughout the day.



Station design and capacity is to respond to primary customer flows and circulation during peak and off peak times.





3.1.3 Wayfinding and Legibility

Relevant Design Objectives

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system

Principle

*Provide intuitive, clear and consistent information and signage as well as legible, intuitive spaces to enhance customer journeys through efficient navigation and interchange. Wayfinding is to create a seamless and intuitive customer journey from origin to final destination to support an easy customer experience.*

Guidelines

- Planning for wayfinding and legibility will support all customers to travel independently and easily on Sydney Metro. This is done by:
  - Anticipating the needs of customers
  - Providing the accurate information at the right time
  - Planning and creating predictable and intuitive environments
  - Applying consistent system of signs and information.
- Spaces are to be visually simple and intuitive to negotiate, to contribute to an easy customer experience. This is done by:
  - Providing visibility between station levels where possible
  - Using intuitive design to minimise wayfinding choices and the need for signage
  - Providing safe, legible, efficient, convenient, obstruction free, level, direct and attractive routes for customer access
- Wayfinding signage and information is to be provided in accordance with the TfNSW guidelines. Ensure consistency with TfNSW signage.
- Customers are to be provided with wayfinding and information when they are:
  - Interchanging between services or modes.
  - Connecting to and from public transport by walking, cycling, catching a taxi, being dropped off or picked up in private vehicle or parking in their car.



Town Hall Station. Wayfinding signage enables easy navigation and interchange.  
Source: TfNSW



Macquarie Park Station design provides a high level of visibility between concourse and platform level to aid wayfinding and legibility.  
Architect: Hassell  
Source: TfNSW

### 3.1.4 Comfort and Amenity

#### Relevant Design Objectives

- 1 Ensuring an easy customer experience

#### Principle

*Provide a comfortable customer environment that provides sufficient personal space and amenity and is well lit with effective and appropriate microclimate amenity for all users.*

#### Guidelines

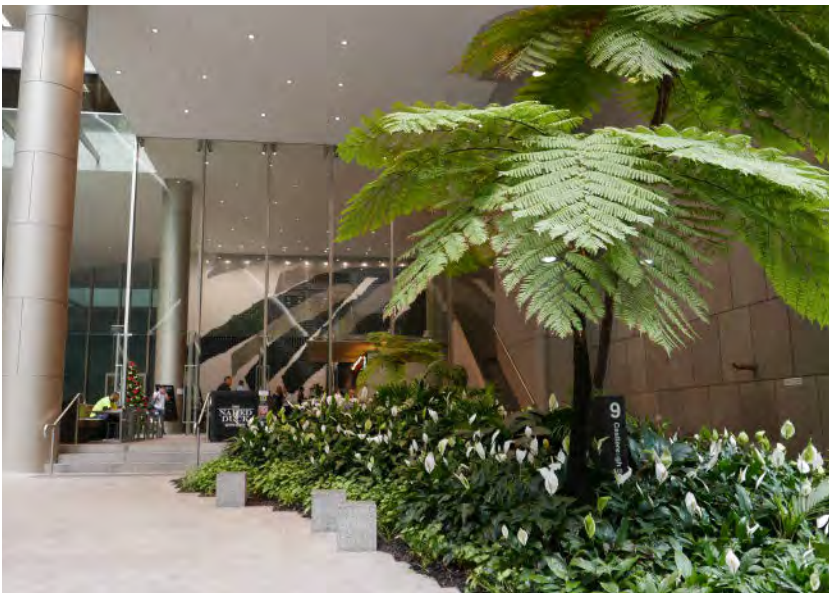
- Station entry orientation and design are to minimise adverse micro climate effects including wind tunnel impacts.
- Customer weather protection outside Sydney Metro stations is to be provided to ensure good levels of customer comfort are maintained and to provide useable spaces at ground level.
- A range of customer facilities and amenities is to be provided to grow patronage by making public transport a more attractive choice.
- A high level of amenity and security in customer waiting areas is to be provided to positively influence patronage and perceptions of the public transport system.
- Waiting areas, pedestrian walkways and cycle ways are to have adequate shade and day and night time lighting, while minimising energy consumption, providing an appropriate balance between sun access in winter and shade in summer.
- Minimise urban heat island effect through light coloured finishes, roofs and pavements, green walls, roofs, plantings and shade trees.



Chatswood Transport Interchange. Waiting and circulation areas outside the station entry are weather protected and have a high level of amenity and customer facilities.

Architect: CoxDesignInc.

Source: Cox Richardson, Photographer: John Gollings



9 Castlereagh Street, Sydney. Landscaped spaces provide shade in waiting areas.

Architect: Harry Seidler & Associates.

Source: Cox Richardson



### 3.1.5 Customer Safety

Relevant Design Objectives

- |   |                                      |
|---|--------------------------------------|
| 1 | Ensuring an easy customer experience |
|---|--------------------------------------|

Principle

*Ensure stations and precincts provide a safe and secure environment for customers and also contribute to the overall public safety of urban places throughout the day and night.*

Guidelines

General

- Safety issues are to be embedded in the design development process and optimised through the application of relevant Crime Prevention through Environmental Design (CPTED) principles and guidelines.
- Operators are to be consulted to advise on issues such as lighting, lines of sight and CCTV, based on their network experience.
- Integrated CCTV systems must be provided at entry and exits, stairways, ramps, bridges, tunnels, lifts, ticket office and vending machines, emergency help points, public telephones, waiting and seating areas in accordance with Australian Standards and Sydney Metro requirements.
- Vandal-resistant fittings and fixtures are to be used throughout.

Public Domain

- An initial CPTED review of station precincts is to assess activity generators, edge effects, movement predictors, conflicting user groups, crime hotspots, the ‘displacement phenomenon’ and building elements
- All public domain areas are to be planned with guidance from CPTED experts, adopt a risk prevention design approach and eliminate entrapment and concealed space opportunities.
- A Crime Risk Assessment audit must be applied to the precinct design to ensure that all precinct areas comply with CPTED guidelines.



Chatswood Transport Interchange, NSW. Design of the public domain enables passive surveillance with clear sight lines through the station areas.  
Architect: CoxDesignInc.  
Source: Cox Richardson

**Stations**

- The station design is to incorporate CPTED strategies:
  - Eliminating hidden spaces, recesses or voids that could provide a person with the ability to conceal themselves or others from general view.
  - Secured stations out of operating hours and during emergencies.
  - Ticket Vending Machines (TVMs) positioned to allow surveillance.
  - Minimising inadvertent or intentional access to hazardous or unauthorised areas of the station.
  - Physical barriers to minimise the risk of trespass or self-harm by station users.
  - Protective screening to elevated walkways and concourse areas particularly where persons traverse above or immediately adjacent to the rail corridor.
  - Glazed lift car and lift shaft enclosures to maximise visibility and safety.
- Station designs are to support visible staff presence as close as possible to customer movement and decision making zones to enhance customer safety.
- The stations are to be designed to minimise obstructions and projections, providing clear routes for customers.
- Station designs are to eliminate crush zones and provide equipment at safe and accessible locations.

**Help Points**

- Help points should be easily identifiable, accessible components integrated into station cladding systems
- Help point enclosures should be integrated with the surrounding wall or equipment cabinet.



Macquarie Park Station, NSW. Glass sided lifts enable passive surveillance and sight lines through to the concourse.  
Architect: Hassell  
Source: Cox Richardson



### 3.1.6 Accessibility

Relevant Design Objectives

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system

Principle

**Ensure the stations and associated spaces are safe, efficient, universally accessible, legible and easy for customers and pedestrians.**

Guidelines

- Stations and precincts are to be easy, safe and accessible for all to use including the elderly, customers with disabilities, young children and those with prams and luggage.
- As far as possible, pedestrian pathways are to be obstacle and step free to maximise access for all customers. Where the use of stairs cannot be avoided, then they must be easy and safe to use.
- Where obstacles to universal access are unavoidable, clearly legible alternative routes must be provided as close as possible to the main travel path.
- Where the use of stairs is unavoidable, clearly legible, alternative accessible circulation routes are to be provided. These alternatives are to be as close as possible and not isolated from the primary circulation route.
- Where lifts and escalators are provided as an alternative to stair access they are not to result in a longer journey than the primary circulation route or compromise the safety of customers who need to use them.
- Ramps may provide opportunities for universal access; however, where possible, seek alternative means of effecting level changes, for example, by altering the path of travel.
- All facilities, furniture and fixings must be designed to be accessible to all customers. Accessible and ambulant toilets must be provided.
- Priority seats and adequate space should be provided in waiting areas and groups of seating to accommodate the elderly and customers with disabilities and prams.

- Information must be provided throughout the customer journey that considers user impairment, culture and language.
- Equivalent service and safety information must be provided for customers with disabilities in their preferred accessible format.
- Public transport information should be provided across a range of multimedia technologies including mobile phones, audio and visual and tactile signage, assisted listening for the hearing impaired and near field technologies to optimise accessibility for all users.
- The use of international icon protocols, colour coding and other graphic devices should also be considered to minimise the use of text-based signage and language difficulties.
- Comply with Disability Standards for Accessible Public Transport.
- All Metro service elements must comply with the Disability Discrimination Act 1992 and associated Public Transport and Premise Standards.



Universal access must be provided to all stations and precinct facilities.  
Source: San Francisco Municipal Transportation Agency



Universal access must cater to customers with a wide range of disabilities.  
Source: TfNSW

## 3.2 Identity

For a project of this importance it is imperative that the design delivers not just on the project objectives but provides an architectural and urban design experience that connects with the city and its diverse communities so that they embrace and identify with the project, the rail line and the opportunities it unlocks.

All of the public transport infrastructure is public space, so internal and external spaces of the stations are public realm. Having a consistent theme binds the internal and external areas integrating paid and unpaid areas and helps the station to integrate within its local context. The station entrances need to engage with their local context to create welcoming landmarks in the urban environment.

A major design objective is the achievement of a 'whole-of-corridor' identity for Sydney Metro. In this respect the design strategies in this section all contribute to the character, appearance, accessibility and function of the stations and their surrounding precincts. A unified approach can be fostered through adherence to common strategies for buildings and structures, finishes, accessibility and legibility that respond to local contexts while forming part of a 'whole-of-corridor' identity.

This part of the document provides guidelines for the following areas of creating a Sydney Metro identity:

- Network and Station Legibility
- Place Making
- Heritage & Archaeology
- Environment & Sustainability
- Art
- Lighting



Southwark Station, London. Station spaces are designed as distinctive, high quality public domain.  
Architect: MPJ Architects  
Source: MPJ Architects

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3.2.1 Network and Station Legibility

Relevant Design Objectives	
1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system
4	Being responsive to distinct contexts and communities

Principle

**Create a line-wide identity for the Chatswood to Sydenham project that is recognisably part of the Sydney Metro network while enabling elements of station design to respond to context, character and environment to create locally distinctive sustainable outcomes.**

Guidelines

- A line-wide identity is to be established through the architectural language and layout of the station types (cut and cover, single cavern, binocular cavern).
- The architectural language and elements of the transport infrastructure and stations are to form a line-wide design that reinforces the Sydney Metro identity within the broader transport network.
- The stations are to maintain a coherent identity with consideration of:
  - Network identity
  - Line-wide identity
  - Station-specific local identity.
- Station buildings, service facilities, public domain elements and component elements are all to form part of the identity and project an image which evokes a modern, contemporary and efficient transport system providing an attractive, comfortable, safe and inspiring customer environment, while also responding to the local context and environment.

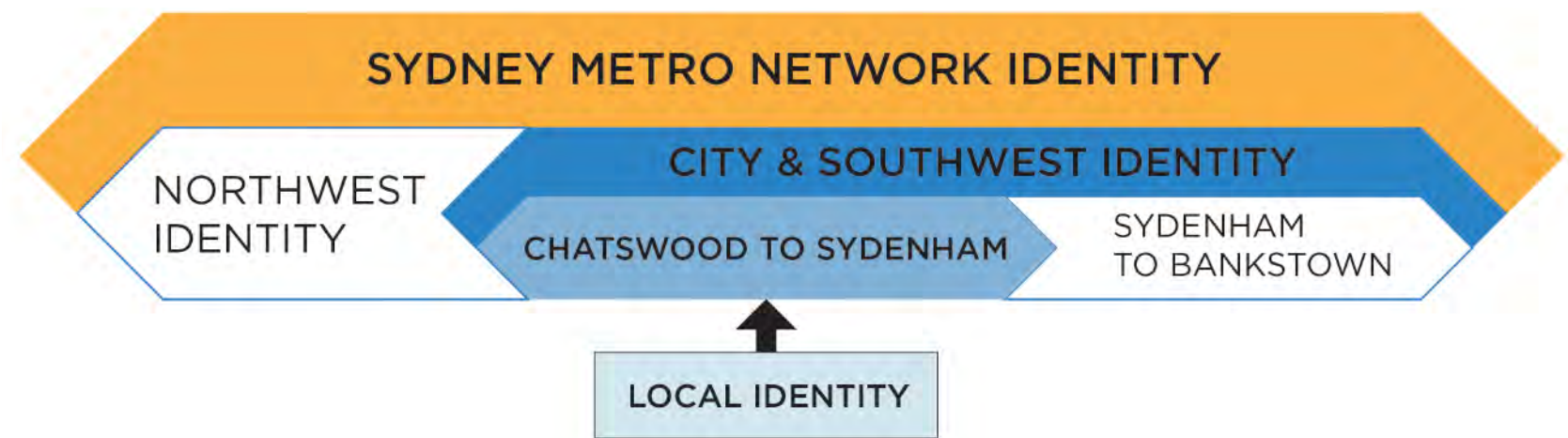


Diagram highlighting the various layers of identity that should be considered in the design.



Kings Cross Station, London. Clear signage contributes to network and station legibility. The architectural quality of the space creates an attractive place for customers with a local identity.  
Architect: John McAslan + Partners  
Source: Cox Richardson

### 3.2.2 Place-making

#### Relevant Design Objectives

- |   |                                      |
|---|--------------------------------------|
| 1 | Ensuring an easy customer experience |
| 3 | Being a catalyst for positive change |

#### Principle

**Create welcoming, secure and well maintained public domain spaces and station buildings with an attractive ‘sense of place’.**

#### Guidelines

- Stations and associated spaces are to promote a welcoming image or identity that reinforces a positive sense of place.
- Station plazas are to be designed as an extension of the internal station environment providing shelter, comfort, safety and security for customers, and contributing positively to customer journey experiences. These spaces are to reflect the local public realm context and character.
- The enhancement of station spaces can be achieved by introducing a range of uses, services and facilities such as retail, food and beverage, shade trees, landscaping and public art.
- Create public spaces which allow for spontaneous uses and activities by their occupants.
- Use opportunities to facilitate active uses and informal recreation.
- Consider opportunities for temporary event, pop ups, retail spaces and the night time economy.
- Station public spaces are to be designed with a consistent hierarchy of landscape treatments. The treatment of these spaces is to reflect local character and context, integrate within their settings, and provide attractive space and streetscapes.
- Fixtures, including furniture and lighting, are to enrich site context and sense of place and contribute to wayfinding.
- A coordinated lighting approach is to create aesthetic consistency across Sydney Metro by defining station address, public domain areas and attracting customer into station forecourts and plazas.
- A positive precinct image is to be developed around the particular heritage values of a place or by the qualities of the existing urban context.



‘Solar Tree’ St John’s Square, London  
Artist: Ross Lovegrove  
Source: Ross Lovegrove



### 3.2.3 Heritage and Archaeology

#### Relevant Design Objectives

- |   |  |
|---|--|
| 4 | Being responsive to distinct contexts and communities    |
| 5 | Delivering an enduring and sustainable legacy for Sydney |

#### 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.**

#### Guidelines

- Sydney Metro is to be fully integrated within, and sensitive to, its heritage context. This includes built and natural heritage, European and Indigenous archaeology and may include places, buildings, works, relics, moveable objects or precincts.
- Where Sydney Metro intervenes in or interfaces with heritage places (such as Central Station or Martin Place), design excellence is to be sought to support inventive, interpretive and contemporary responses to the heritage values of that place.
- Where appropriate, the design of the rail corridor and station precincts are to integrate and conserve existing heritage items and mitigate any negative impacts.
- Actively anticipate the research, site investigation, salvage and culturally appropriate safekeeping of Indigenous heritage uncovered by the Sydney Metro project.
- New work is to be based on an understanding of the heritage significance of heritage items, heritage conservation areas and places and is also to take into consideration:
  - Siting - including urban grain, streetscape rhythm, setbacks, orientation and address of buildings, location of boundary walls, key views, significant natural features and archaeological remains,
  - Scale - including wall and floor to floor heights, modulation and façade rhythms, massing, density, proportions, relationship to ground plane, wall modulation including openings and roof planes,

- Form - including proportion and number of openings, solid to void ratios, roof form, skyline and relationship between internal and external spaces,
  - Materials and colour - giving consideration to characteristic materials, textures, colours, light and shadow,
  - Details - creating complementary relationships between new and old elements to provide visual interest.
- Consideration is to be given to integrating heritage interpretation with Public Art.
  - Retaining or interpreting heritage fabric is to be viewed as a means of defining local identity.
  - For new underground stations, archaeological material, features and deposits may need to be considered.



Newtown Station, Sydney. Heritage interpretation.  
Architect: NSW Government Architects Office/Caldis Cook Group.  
Source: TfNSW



St Pancras Station, London. Heritage building has been enhanced to accommodate new rail requirements.  
Architect: Alistair Lansley  
Source: Visit London

### 3.2.4 Environment and Sustainability

#### Relevant Design Objectives

5 Delivering an enduring and sustainable legacy for Sydney

#### Principle

***Ensure best practice sustainable design solutions are adopted for the public domain, stations and buildings, to minimise environmental impacts and benefit customers and local communities.***

#### Guidelines

- Achieve a high level of performance using sustainable design rating systems.
- Adopt energy efficient and low carbon design solutions that minimise the carbon intensity of the project.
- Incorporate passive design solutions to optimise solar access, introduce daylight, and maximise natural ventilation.
- Harness both direct and indirect daylight to minimise energy consumption in lighting, while creating a light and airy ambience in stations and surface buildings.
- Utilise energy efficient lighting and lighting control systems.
- Ensure resilience to climate change, by incorporating climate change adaptation measures which respond to weather extremes, including flood risk, and temperature increases.
- Provide a positive journey experience in station precincts by protecting users from the potential negative impacts of extreme weather.
- Ensure designs respond to the local microclimate and incorporate opportunities to reduce heat island effects, including (as appropriate) light coloured finishes, roofs and pavements, green walls or roofs, plantings, and shade trees.
- Include integration of renewable energy sources at stations and in the public domain where feasible.
- Consider water efficiency in design, utilising water from recycled sources where appropriate.
- Opportunities for collection, treatment, storage and reuse of rainwater from station roofs, canopies and other surfaces are to be considered where practicable within the urban environment.
- Water Sensitive Urban Design (WSUD) initiatives are to include an integrated and site-responsive range of design solutions, influenced by urban design considerations and be adaptable into the future.
- Minimise materials consumption, and reduce embodied energy and impacts in materials selection.
- Prioritise reuse of materials, use of recycled materials, and selection of materials from sustainable sources.

- Use durable, climate resilient, long life, healthy, low maintenance materials.
- Maximise opportunities for beneficial reuse of spoil in landscape features and other uses.
- Provide noise control measures to ensure appropriate and comfortable acoustic conditions for users.
- Minimise waste through efficient design and material selections.



Central Park, Sydney. Landscaped facade treatment helps cool the microclimate.  
Architect: Jean Nouvel  
Source: Cox Richardson



3.2.5 Art

Relevant Design Objectives

1	Ensuring an easy customer experience
4	Being responsive to distinct contexts and communities

Principle

*Ensure public art is integrated within the design of stations and other corridor structures to aid place-making and to enhance local amenity and celebrate local character.*

Guidelines

- Public art is to be a key feature of the customer experience, bringing joy to customers and adding value to the operation and success of Sydney Metro by contributing to station identity, beauty, amenity, wayfinding, safety, security, community values and the public domain.
- Public art is to be integrated into the station and building designs to enliven and enrich the public realm and contribute to a sense of place.
- Public art is to be integrated but separate from the architecture, budgeted and managed from the architectural scope.
- The design and location of art works is to be coordinated within the broader urban context of city stations and be reflective of the distinctive character of each place.
- Consider the re-installation of artworks present in existing buildings or streets to be changed as part of Sydney Metro works.
- Artworks are to contribute to the cultural identity of precincts and neighbourhoods and are to be developed in consultation with the local community and stakeholders.
- Maximise community involvement/representation/ownership in public art.
- Art works must be located to support the safe intermodal function of precincts around Metro stations.
- In station concourse and precinct areas, appropriate integration is required of permanent artworks with station wayfinding, information and other customer amenities.



Artwork may also be incorporated into the public realm as part of a building element.  
Artist: Bronwyn Bancroft.  
Source: TfNSW



Georg-Brauchle-Ring Station, Munich U-Bahn, Germany. Artwork on the trackside walls gives the station a distinctive identity and facilitates wayfinding.  
Artist: Franz Ackermann  
Source: Wikipedia

### 3.2.6 Lighting

#### Relevant Design Objectives

1	Ensuring an easy customer experience
4	Being responsive to distinct contexts and communities

#### Principle

*Ensure a coordinated approach to lighting that responds to the local context, addresses CPTED and operational requirements and provides feature lighting representative of the Sydney Metro image. Use light to enhance station built form and corridor landscape, whilst delivering functional lighting and creating a safe and high quality experience for all users.*

#### Guidelines

##### General

- Lighting is to integrate with access, wayfinding and public art strategies.
- Lighting is to reinforce the visibility of station entries as safe and welcoming elements within the local context at night.
- Illumination levels are to be appropriate to the task, be it wayfinding, reading tasks and facial recognition, while creating visual interest within the stations.
- Glare and visual discomfort is to be eliminated through appropriate specification and positioning of luminaires.
- The number of luminaires is to be minimised to aid maintenance and sustainable aspirations.
- A coordinated lighting approach is to provide aesthetic consistency across Sydney Metro by defining station address, public domain areas and attracting customers into station precincts.
- Provide market leading energy efficient lighting and lighting control systems.

##### Public Domain

- Lighting at station precincts and facilities must provide a safe, secure, legible and comfortable environment for all operators and users.
- Provide public space lighting to facilitate diverse uses including night time use of public spaces.
- Station precincts are to be defined by the application of an iconic, consistent, multi-functional pole and luminaire system, as for example at Epping to Chatswood Rail Line stations in Sydney.
- To eliminate unnecessary clutter, lighting must be coordinated with all other public domain elements.
- Lighting within station precincts is to celebrate the station address and pedestrian links with lighting systems that are of an appropriate scale, different to that which defines the precinct streets and street frontages.

##### Stations

- Lighting is to complement the architectural design and seek to provide an appropriate balance of artificial and daylight.
- Natural light is to be maximised and artificial lighting is to support natural light levels.
- Protection from intense sun penetration is to be provided.



Britomart Transport Centre, Auckland. Lighting is designed to provide a safe, legible and comfortable environment for customers and users.  
Architects: Mario Madayag & Jasmax  
Source: Opus



Westfriedhof Station, Munich. Coloured light in station platform  
Lighting Designer: Ingo Maurer  
Source: Unframed World



## 3.3 Connectivity

Safe and convenient connections to and from Sydney Metro stations are an important part of an easy customer experience. Connectivity between different transport modes including walking, cycling, rail, light rail, buses, taxis and kiss and ride, must be legible and easy, acknowledging that Sydney Metro is part of an integrated transport system.

A modal hierarchy that prioritises pedestrian connections has been established to guide the Sydney Metro design and ensure the safety and wellbeing of customers and users of the station environs.

The design of the Sydney Metro stations and station precincts must facilitate safe, welcoming intuitive and accessible connections between transport modes. This part provides guidelines for the following:

- Interchange
- Pedestrian Movement
- Bicycle Movement
- Vehicular Interface



Signage supports connectivity between different modes, and provides customer information to assist trip planning.  
Source: TfNSW

### 3.3.1 Interchange

#### Relevant Design Objectives

- |   |   |
|---|---|
| 1 | Ensuring an easy customer experience              |
| 2 | Being part of a fully integrated transport system |

#### Principle

**Provide an efficient, safe transport service that is part of a fully integrated and accessible transport system.**

#### Guidelines

- Station planning and design is to acknowledge Sydney Metro forms part of an integrated transport network that includes a hierarchy of movement modes:
  - Priority 1: Pedestrian, wheelchair and pram movement and access
  - Priority 2: Bicycle movement and access
  - Priority 3: Other primary Public Transport services (including Light Rail and Bus movement and access)
  - Priority 4: Taxi movement and access
  - Priority 5: Kiss and ride movement and access
- Station Precinct planning is to support good access to and between public transport modes for all customers, with connections designed to support efficient and timely interchange for customers.
- Integration of station precincts with the surrounding urban structure is to facilitate cross and through movements, enhancing precinct permeability and access to the transport interchange functions of the locality.
- The stations are to provide a safe, welcoming, intuitive and accessible environment for customers transferring between transport modes.
- Station design is to minimise movement conflicts for customers between key transport modes.
- Station forecourt areas to accommodate adequate customer access and waiting spaces (as relevant), while ensuring that customer confidence, sense of safety and wellbeing are not compromised.
- The varying spatial requirements of different transport modes, including third party operators, are to be accommodated to avoid user conflicts.
- Provide point of decision wayfinding signage to facilitate walking and cycling choices.
- Consider the Sydney City Centre Access Strategy when planning for transport and interchange functions around stations.



Station modal access hierarchy  
Source: TfNSW



### 3.3.2 Pedestrian Movement

#### Relevant Design Objectives

- |   |   |
|---|---|
| 1 | Ensuring an easy customer experience              |
| 2 | Being part of a fully integrated transport system |

#### Principles

***Provide pedestrian connectivity between transport modes that is safe, efficient, accessible, legible and enjoyable.***

***Provide pedestrian movement systems that clearly connect the stations with their surrounding locality.***

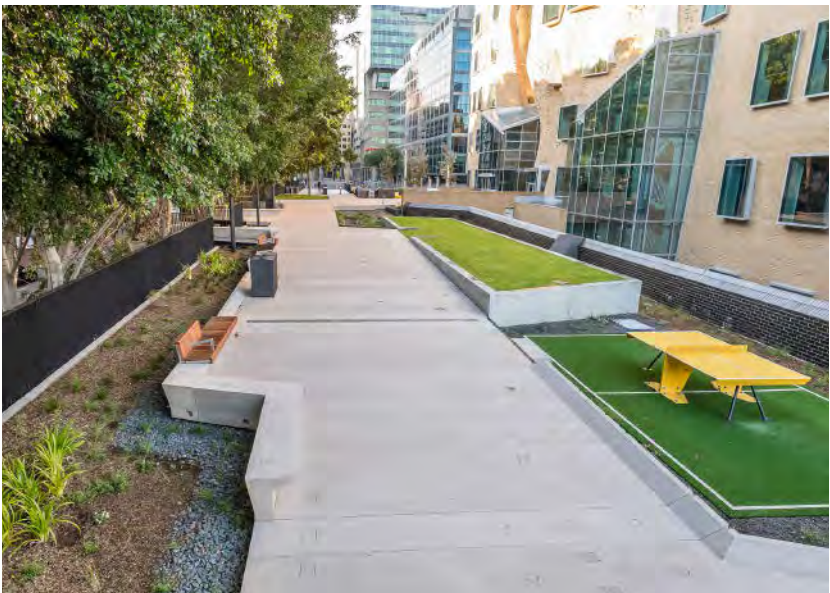
***Ensure the vertical journey is a core element of the station architecture and provides step free access between the street and the platforms as it is integral to the station's design and has a major influence on the function and visual impact of the station environment.***

#### Guidelines

- The station forecourt and associated areas are to adopt a clear hierarchy of movement functions that favour pedestrians ahead of vehicular circulation, thereby promoting opportunities for public transport patronage, walking and cycling.
- Station precincts are to provide pedestrian routes that connect people with places they want to go and provide clear sightlines through open, uncluttered spaces along pedestrian desire lines between key destinations.
- Pedestrian movements are to accommodate an appropriate level of service in all areas of the station. Precinct designs are to optimise the variety of movement functions in order to minimise potential conflicts.
- Circulation systems are to respond to context and reinforce the character of precincts so they are easy and efficient to navigate.
- Design decisions affecting movement planning are to consider varying customer usage patterns including commuters, customers with disabilities, station employees, tourist customers and non-travelling visitors.



Wide, clear footpaths enable people to stop and wait without obstructing pedestrian movement flow.  
Source: TfNSW



The Goods Line, Sydney. Design walkable attractive places with high visual amenity. Circulation systems that respond to context and reinforce the character of precincts should be easier to navigate and therefore more efficient.  
Architect & Landscape Architect: CHROFI & Aspect Studios  
Source: TfNSW

### 3.3.3 Bicycle Movement

#### Relevant Design Objectives

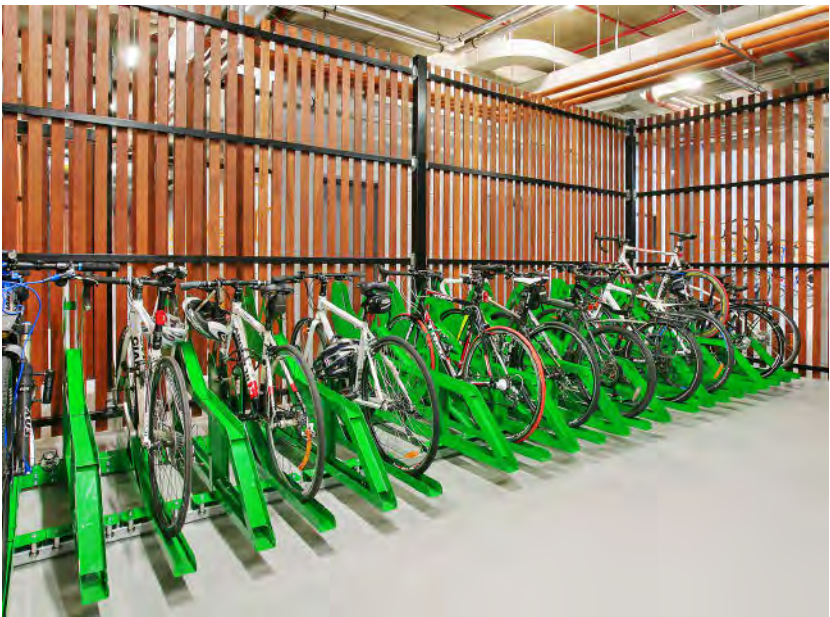
- 2 Being part of a fully integrated transport system

#### Principle

***Prioritise bicycle movement consistent with the modal access hierarchy by providing optimum connectivity and convenient, secure and accessible bicycle parking at stations to accommodate current and future demands.***

#### Guidelines

- Bicycle paths to/from stations are to be connected with regional and local government bicycle networks, existing and future.
- Bicycle infrastructure is to be responsive to the specific characteristics of each station precinct, address the bicycle network and storage requirements, and integrate them into the broader precinct movement networks.
- The design of bicycle paths and routes connecting directly to/from stations is to be legible, with a distinct and identifiable character and be safe for cyclists and other users.
- Access to bicycle networks is to be easy, enabling the comfortable flow of bicycle traffic.
- Conflicts between pedestrians and cyclists at stations are to be designed out, particularly at high activity zones such as station entries and retail areas.
- Provide convenient, safe, secure bicycle storage facilities, with good natural surveillance and weather protection, connected to existing cycle ways.
- Sheltered and secure bicycle parking at stations is to be placed directly adjacent to movement paths to provide clear and legible access, without compromising safe, accessible paths of travel for customers with mobility and vision impairment.
- Design for bicycle facilities is to give priority to bicycle safety at road interfaces.
- Integrate with the directions established in Sydney's Cycling Future.



Attractive, secure, weather protected bicycle storage.  
Source: Sydney Cycleways.



Provide for people with bicycles throughout the intermodal connections.  
Source: TfNSW. Copyright: Glenn Duffus Photography



### 3.3.4 Vehicular Interface

#### Relevant Design Objectives

- 2 Being part of a fully integrated transport system

#### Principle

*Establish a legible hierarchy of safe vehicular streets that respond to the varying customer and operational requirements for vehicular, bicycle and pedestrian movements in accordance with the modal hierarchy.*

#### Guidelines

- The design of stations and associated urban realm is to respond to the character of established streets and variations in carriageway width, on-street parking, existing and planned future cycle ways, street tree planting and pedestrian amenity.
- Modifications to existing roads are to consider:
  - Agreed adjustment of existing roads with relevant authority
  - Number of traffic lanes
  - Length and type of slip lanes
  - Intersection types and configurations Signalling requirements
  - Speed environments, traffic calming measures
  - Kerbside zones
  - Cycling
  - Footpaths
  - Crossings
- Changes to streets, footpaths and bicycle paths are to contribute to the quality and character of the urban area, and will heavily influence customer experience.
- Vehicular traffic planning is to be integrated with the built form and spatial planning of precincts.
- Consider the Sydney City Centre Access Strategy in planning for vehicular movement around stations.
- Provide for bus stops close to the station in accordance with the modal hierarchy, bus movements where buses operate on streets adjacent to station entries and safe and accessible paths to bus stops.
- Consider the need for secure electric bike/scooter and motorbike parking spaces. Consider locker provision at stations to cater for storage of electric scooters, electric bicycles, and batteries, and charging of personal electric transport.
- Taxi and kiss and ride spaces are to be located in accordance with the modal hierarchy.
- Service vehicle access for all precinct functions is to be addressed as part of the broader station precinct movement strategies.

Note - further guidelines on Service Vehicle Access are set out in Section 4.3.7



Sydney. Dedicated bicycle and bus lanes.  
Source: TfNSW



Sydney City. Designated taxi pick up zones.  
Source: AECOM.



# 4

## Elements

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## About this Section

This section provides guidelines for developing the detailed elements of the urban and public domain around and within stations including connecting customer areas through station entries.

The guidelines for the design elements in this part of the document are arranged according to the following three topics:

- Stations
- Urban Realm
- Operational and Services

More detailed design guidelines and key requirements for each of these elements will be included in the scope and performance documents during the procurement stage.



Sculptural plant extraction vents at One Shelley Street, Sydney.  
Artist: Anton James  
Source: TfNSW



# 4.1 Stations

The Sydney Metro stations are part of a wider system requiring consistency between station planning, operations and architecture. Each station will take on a unique identity that relates to its locality, expressed through the station design. The interface between the station and surrounding context is critical in providing an integrated and legible transport system that is easy for the customer to use.

The design of each station must be framed around the benefits to or impacts upon the customer experience. Station entries, platforms and circulation elements must be designed to meet operational requirements while ensuring an easy customer experience. Stations are public buildings and all circulation elements, finishes and fittings must be of a robustness and quality associated with outdoor public spaces as well as suitability for the rail environment.

This part provides guidelines for the following station elements:

- Station Typology
- Station Entries
- Platforms
- Circulation Elements
- Flooring
- Internal Walls and Ceilings



Macquarie Park Station. Clear sightlines and uncluttered spaces provide a safe and welcoming customer environment.  
Source: TfNSW



### 4.1.1 Station Typology

Relevant Design Objectives

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system
5	Delivering an enduring and sustainable legacy for Sydney

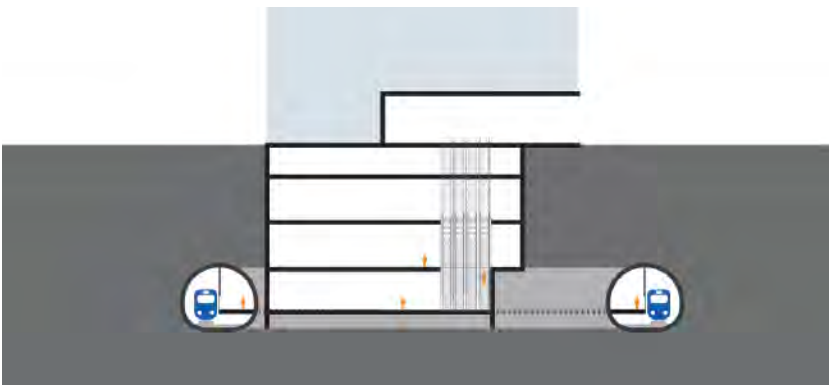
Principle

*The designs are to provide consistency between station planning, operations and architecture across the differing station typologies that will be adopted between Chatswood and Sydenham. There will be three principal typologies that relate to their construction type:*

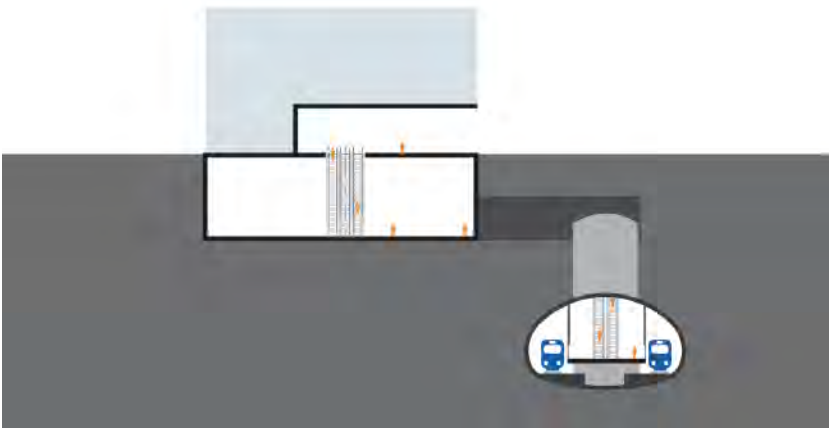
- **Cut and cover**
- **Single cavern**
- **Binocular cavern**

Guidelines

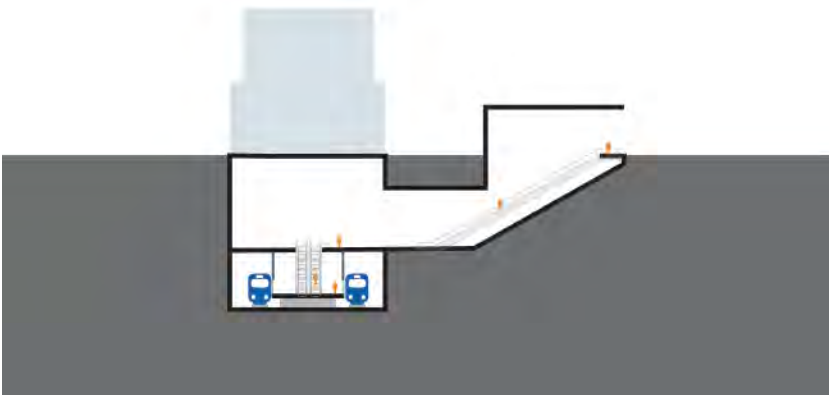
- The stations are to be integrated with the urban design of the adjoining precinct to provide direct and safe accessibility to the station entry.
- The station design is to enable integration with existing and future local development opportunities within adjacent sites as relevant.
- Designs are to provide a legible station entry integrated with public domain.
- Station designs are to provide a seamless transition between transport modes.
- The Sydney Metro stations should maximise consistency in the key functional elements of the architecture.
- Where there is sufficient space and where appropriate, station entries and gatelines are to be located at ground level to provide a line of security at street level.
- Integration of operational and customer facilities is to be consistent across the three typologies providing a high quality and consistent experience for all users.
- Design to minimise level changes between the street and station entries
- Maximise access to natural light and ventilation
- All entries and concourses are to be open and transparent, generous and inviting.
- Design for efficient customer circulation and intuitive wayfinding to and from station entries and platforms.
- Allow for affordable and flexible business premises including pop ups, start-ups, micro and small businesses.
- Consider role of station retail elements in supporting a night time economy, including retail areas, lighting, and use of public spaces by the community.



**BINOCULAR CAVERN STATIONS**  
MARTIN PLACE  
PITT STREET



**SINGLE CAVERN STATIONS**  
VICTORIA CROSS



**CUT AND COVER STATIONS**  
CROWS NEST  
BARANGAROO  
CENTRAL  
WATERLOO

## 4.1.2 Station Entries

### Relevant Design Objectives

1	Ensuring an easy customer experience
4	Being responsive to distinct contexts and communities
5	Delivering an enduring and sustainable legacy for Sydney

### Principle

**Station entries including canopies and concourses are to create a strong and consistent line-wide visual identity to the station environments and be designed as intuitive interchange spaces for customers.**

### Guidelines

#### General

- Entrances to stations including canopies and concourses are to provide a consistent line-wide identity for Sydney Metro and are to be clearly visible from the immediate area.
- Canopies and entrances are to respond to the built form and character of the surrounding context in terms of scale, setbacks and character, as well as heritage context where relevant.
- Station entries are to be legible from the street and public domain and are to minimise long blank walls through articulation of the built form.
- Station entries are to provide active street frontages where possible, prioritising pedestrian activity and amenity at ground level.
- Station entries are to incorporate canopies/awnings as appropriate to provide weather protection for customers, community information, amenities, and ticketing equipment, gateline and appropriate queuing zones.
- Entry concourses should be clutter-free with clear and simple directional signage, simple volumes and flush continuous materials with components that support wayfinding.

- Entry spaces are to be well lit, bright and welcoming to enhance customer experience providing a safe, open environment that has good permeability and clear sight lines from inside and outside the station.
- Where possible, natural light areas should be provided over Vertical Transport (VT) and concourse areas to reinforce intuitive wayfinding.
- Adequate space should be provided to meet patronage demand and to provide clear zones for queuing at Ticket Vending Machines (TVMs) and gatelines, including during special events, separate to paths of travel.
- Columns are to be minimised and carefully positioned not to obstruct key sightlines or pedestrian movement, particularly for the mobility or visually impaired.
- Lighting, communication, wayfinding and information and security systems are to be well integrated with equipment and recessed where possible.
- Unobtrusive maintenance access is to be provided.
- The materials palette is to be of high quality and is to integrate with surrounding high quality public realm context.
- Permanent public art should be integrated within the station architecture. Art should act as a visual cue to enhance wayfinding.

### Canopies and Awnings

- Canopy or awning features are to consider the adjacent character of buildings and should sit comfortably within their context.
- The entry canopy/awning design is to create a recognisable identity for stations along the Sydney Metro line but may not necessarily be common across all types of stations due to the diversity of the built form.
- Entry canopies should be clearly visible in the locality.
- The entry canopies should promote a sense of arrival and offer a weather protected threshold for customers.
- The entry canopy design should contribute positively to the built environment by enhancing the immediate public domain.
- Weather protection to station entry and concourse should be provided as a single integrated element.
- Roof lights should be integrated within the entry canopy and located directly over the customer's path of travel towards the vertical circulation zone to aid intuitive wayfinding.



Canary Wharf Station, London. Natural light over entries and VT enhances wayfinding and creates a welcoming station environment.  
Architect: Foster + Partners  
Source: Cox Richardson



### 4.1.3 Platforms

#### Relevant Design Objectives

- |   |                                      |
|---|--------------------------------------|
| 1 | Ensuring an easy customer experience |
|---|--------------------------------------|

#### Principle

**Platform designs are to maximise efficiency and provide a high level of service and an easy customer experience.**

#### Guidelines

- Platforms are to provide efficient and safe access to the Metro service through good sightlines, generous circulation and open and spacious planning.
- Vertical transport (VT) distribution and position on the platform is to be coordinated with the demand and movement patterns of customers.
- Platforms are to be free of recesses and indentations which could offer hiding places and litter traps, disrupt continuous paths of travel for the visually impaired and hinder CCTV coverage.
- Emergency egress must be provided.
- Platforms should establish a strong relationship with the vertical circulation zone through lighting and material palette selection.
- Platforms should minimise structures and columns to maximise sightlines and customer waiting and circulation space.

Note - design guidelines for platform screen doors are set out in Section 4.1.6.



Canary Wharf Station, London. Example of central columns and fixtures  
Architect: Foster + Partners  
Source: Cox Richardson



Macquarie Park Station. Example of transparent vertical circulation within an open platform that maximises sight lines.  
Architect: Hassell  
Source: Cox Richardson

### 4.1.4 Circulation Elements

**Relevant Design Objectives**

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system

**Principle**

*Enable step free access between the street and the platform via lifts and escalators that are integrated with station design.*

**Guidelines**

- All Sydney Metro platforms are to be served by escalators and lifts. Lifts and escalators are to provide direct access from entry concourse to platform level.
- All circulation elements are to provide a means of safe movement of people in and around the stations.
- Stairs are to be avoided in stations as far as possible as they reduce opportunities for universal access. Where the use of stairs cannot be avoided or provide a secondary means of access, they must be easy and safe to use.
- Where ramps, lifts and escalators are provided as an alternative to stair access they must not result in a longer journey than the primary circulation route.
- Escalators are to enable a safe, fast and efficient method for vertical transportation for customers to and from station entrance level and platform levels.
- Where feasible, provide stairs adjacent to escalators to facilitate increased levels of activity and for when escalators are closed for maintenance.
- Lifts are to integrate into each different station design and be strong architectural elements in their own right to promote the inclusion of customers using step free circulation elements.
- All circulation elements are to incorporate high quality materials that contribute to the Sydney Metro identity.

Note - further design guidelines on accessible pathways are set out in Section 4.2.2.



Chatswood Transport Interchange, NSW. Good example of a glazed lift and shaft  
Architect: CoxDesignInc.  
Source: Cox Richardson



### 4.1.5 Flooring

**Relevant Design Objectives**

1	Ensuring an easy customer experience
4	Being responsive to distinct contexts and communities
5	Delivering an enduring and sustainable legacy for Sydney

**Principle**

*Ensure the safe, efficient movement of pedestrians, including people with disabilities, through high quality and robust flooring design suitable for the station environment.*

**Guidelines**

- Flooring is to provide a safe and robust solution, suitable for the station environments. Types of flooring include those appropriate to public areas and others to areas of the station where special flooring is required.
- Flooring is to form a part of the Sydney Metro line-wide identity and maximise operational efficiencies.
- Flooring selection is to consider long term wear and tear, maintenance, sustainability objectives including dematerialisation and embodied energy, and future replacement as an important consideration in the design process.
- Flooring is to consider the urban realm context of the station, creating a seamless transition between the external and internal station environs.
- Flooring is to provide a clean, attractive and uniform appearance throughout the stations and is to be integrated with the broader internal materials palette to aid wayfinding.
- Flooring pattern and design is to accentuate movement.



Coordinate interior and exterior public domain pavements.  
Source: AECOM.



North Sydney Station, NSW. Example of an open clutter free concourse with directional flooring.  
Architect: Cox Richardson  
Source: Cox Richardson

4.1.6 Internal Walls and Ceilings

Relevant Design Objectives

1	Ensuring an easy customer experience
4	Being responsive to distinct contexts and communities
5	Delivering an enduring and sustainable legacy for Sydney

Principle

*The vision for the design of wall and ceiling elements is the development of a system with inherent flexibility to adapt to the characteristics of individual stations while contributing to the Sydney Metro line-wide identity.*

Guidelines

General

- The appearance and function of the walls is to be suitable for a rail environment and reinforce the Sydney Metro identity.
- Wall systems and details are to respond to their location, function and acoustic environment.
- Ease of access, maintenance and replacement of walls sections is to be considered.
- Robust cladding materials and finishes are to be selected in response to the local environment and conditions.
- Feature walls are to be an identifiable station element used in vertical circulation zones to accentuate the customer pathways and establish a strong architectural language.
- Walls and ceilings over tracks are to be calm and simple and contribute to the high quality station environment and customer experience.
- The materials palette should balance a calm and neutral quality with vibrant materials to aid wayfinding and accentuate movement.
- Use of colour/texture should assist in legibility and wayfinding.
- Wall and ceiling detailing should take into consideration the integration of station assets such as signage, fixtures and machines.

Platform Screen Doors

- Platform Screen Doors (PSDs) are to be minimal and elegant, seamlessly integrating customer information and supporting the station servicing requirements.
- Stations are to integrate the following PSD design considerations:
  - Be full height
  - Run full platform length
  - Integration of the end walls is to be well-considered.
  - Extent of glazing for customer experience is to be well-considered.
  - Security requirements
  - Modularity of units - constructability, repair and replacement.
  - Interface with other wall, floor and ceiling junctions



Copenhagen Metro, Denmark. Good example of full height PSD  
Architect: KHRAS Architects  
Source: Cox Richardson



## 4.2 Urban Realm

The public domain is a significant component of the door-to-door journey for Sydney Metro customers. The design quality of station precincts, forecourts and streetscapes outside station entries will therefore be of paramount importance to the overall public experience and perception of the new system. This has implications for the detailed design stages of the project with a range of architectural and engineering structures, landscaping elements and operational equipment that will need to be coordinated to ensure that coherent and distinctive station environs are delivered.

Each station will take on a unique identity that responds to its locality, expressed through the station design in both precinct urban realm and buildings. The interface between the station and surrounding streetscape needs to be well integrated and functional as part of the provision of robust and legible interchange precincts around Sydney Metro stations.

Key elements of the public realm around Metro stations and the alignment that are considered in this part of the document include:

- Landscaping
- Accessible pathways
- Furniture
- Walls and Fences
- Earthworks and Engineered Structures



The Goods Line, Sydney.  
Architect & Landscape Architect: CHROFI & Aspect Studios  
Source: TfNSW

## 4.2.1 Landscaping

### Relevant Design Objectives

1	Ensuring an easy customer experience
4	Being responsive to distinct contexts and communities
5	Delivering an enduring and sustainable legacy for Sydney

### Principle

***Provide hard and soft landscapes that establish a civic quality to the Sydney Metro project and an attractive customer public realm at stations located within the central city. Reflect the existing urban character along the corridor that is appropriate to local conditions.***

### Guidelines

#### General

- The landscape design is an important component of a positive, high quality and appealing urban realm identity for Metro stations and structures.
- Hard and soft landscaping design, species selection and material palettes are to relate and reflect the existing urban fabric of the city.
- Landscape treatments are to be appropriate to a functional station and related transport operations and address safety-in-design issues relevant to a transport customer environment and adjacent road and public realm networks.
- Landscape treatments are to be designed to provide appropriate scale and comfort to users throughout the seasons, with planting and materials palettes suited to the local microclimate and any surrounding development considerations.
- Integrate water sensitive urban design including permeable pavement.
- Consider reuse of materials from demolition e.g. in public space landscaping.
- Materials are to minimise slips, trips and falls.

#### Hard Landscaping

- The external materials palette is to be durable and establish a strong Sydney Metro identity, consistent with a CBD and inner-urban station environment.
- Materials and finishes are to be high quality, robust, durable and meet all functional requirements such as customer interface, component and services integration.
- A hierarchy of paving types should be provided that are appropriate to function and location.
- Use of colour/texture is to assist in legibility and wayfinding, within the context of the immediate station public realm.
- To optimise the legibility of precinct spaces, paving should consist of simple, linear patterns that relate to the main direction of travel.
- The paving palette is to be developed with reference to relevant local council public domain requirements and materials guidelines.
- Materials are to maximise economies of scale and be designed to ensure safe installation, low maintenance and long term durability to minimise the need for replacement.
- Paving is to be the same on each side of the station gateline and be of the highest quality consistent with the Sydney Metro image.
- As well as satisfying the relevant standards and design codes for visual and tactile contrast, products should be selected in order to complement the design of associated pavement materials.

#### Soft Planting

- Plant species are to be appropriate to local conditions and relate to the character of the urban context - both current and/or planned future context.
- The general planting arrangements and species are to suit the spatial scale of each public domain setting, without compromising pedestrian capacity and circulation outside stations.
- Where appropriate street trees are to provide strong, legible structure planting where appropriate at stations, either to reinforce spatial movement, connectivity with adjacent areas, civic quality, visual continuity or identity and character.
- Depending on orientation and urban enclosure, selected tree species are to provide shade during summer months and good solar access in winter months. Proposed species are to respond to existing council policies and guidelines and character drivers.
- Proposed plants are to be low maintenance and based on minimal water requirements beyond the establishment phase.
- Trees, shrubs and groundcover are to help reduce potential heat island effects and to provide valuable amenity for customers and the broader urban community.
- Screen planting is to be employed to help mitigate the visual impact of retaining structures, noise walls and service facilities as required.
- All planting must maintain clear setbacks and sight lines at road intersections and be offset from other transport infrastructure elements at suitable distances for the selected species.



## 4.2.2 Accessible Pathways

### Relevant Design Objectives

- |   |   |
|---|---|
| 1 | Ensuring an easy customer experience              |
| 2 | Being part of a fully integrated transport system |

### Principle

***Provide pathways to and from station entries and facilities that are accessible, safe and comfortable for all users.***

### Guidelines

- A system of appropriate pathway surfaces, widths and gradients is to provide safe and equitable pedestrian access throughout the public domain and to link transport modes.
- Station precincts must be easy and safe for all to use regardless of physical mobility; able bodied customers, wheelchair users, carers with strollers, the visually and cognitively impaired should all be provided with equal access.
- Stairs are to be avoided as far as possible as they reduce opportunities for universal access. Where the use of stairs cannot be avoided, then they must be short in length, easy and safe to use.
- Where the use of stairs is unavoidable, clearly legible alternative circulation routes should be provided. These alternatives should be as close as possible and not isolated from the primary circulation route.
- Ramps may provide opportunities for universal access; however, where possible, seek alternative means of effecting level changes, for example, by altering the path of travel.
- All alternative means of effecting level changes should be considered, for example by altering the path of travel.
- Selective use of colour, texture, lighting, finishes and customer information to further define paths of travel, circulation spaces and the location of key facilities.
- Tactile Ground Surface Indicators (TGSIs) should be used on paths of travel to warn customers with vision impairment of hazards and assist wayfinding where required.
- Where possible, provide a consistent, clear path of travel for customers with vision and mobility impairments by keeping one side of paths of travel clear of fittings and fixtures.



Design paths and ramps for access for all. All modal connections must be located in convenient, safe, well-lit areas with good natural surveillance.  
Source: AECOM.



Martin Place, Sydney. Carefully locate all street furniture to minimise potential obstructions and maximise use of circulation spaces.  
Source: AECOM.



### 4.2.3 Furniture

#### Relevant Design Objectives

- |   |   |
|---|---|
| 1 | Ensuring an easy customer experience              |
| 2 | Being part of a fully integrated transport system |

#### Principle

***Furniture and fixtures are to provide respite, safety, comfort, services and functionality to public spaces, as well as punctuating the station domain with items of interest.***

#### Guidelines

##### General

- Furniture and fixings are to be robust, high quality and attractive, respond appropriately to context and be representative of the Sydney Metro identity.
- In addition to their functional and amenity value, furniture and fixings are to be used to delineate function zones and restrict or manage pedestrian access.
- Elements in common locations (bins/seating/drinking fountains/bollards) are to adopt a rational layout in order to minimise visual clutter within the public domain and maximise safe and accessible paths of travel.
- All components should be accessible and fully integrated with the station design.
- Modularity of components should retain ability for future enhancement or replacement.
- Robust materials should ensure durability within a rail environment.
- Street furniture should be selected with consideration to facilitating active uses and informal recreation.

##### Seating

- Seating placement should not impede customer flows and be located to provide resting points for the customer journey.
- Provide seating integrated with structures and landscape elements where it does not impede customer flows.
- Seating is to be located along main paths of travel adjacent to entrances, transit shelters, major crossover areas and no more than 60m apart.
- The location and grouping of seating and other elements is also an opportunity to help create meeting places and a sense of place.

##### Handrails and Balustrades

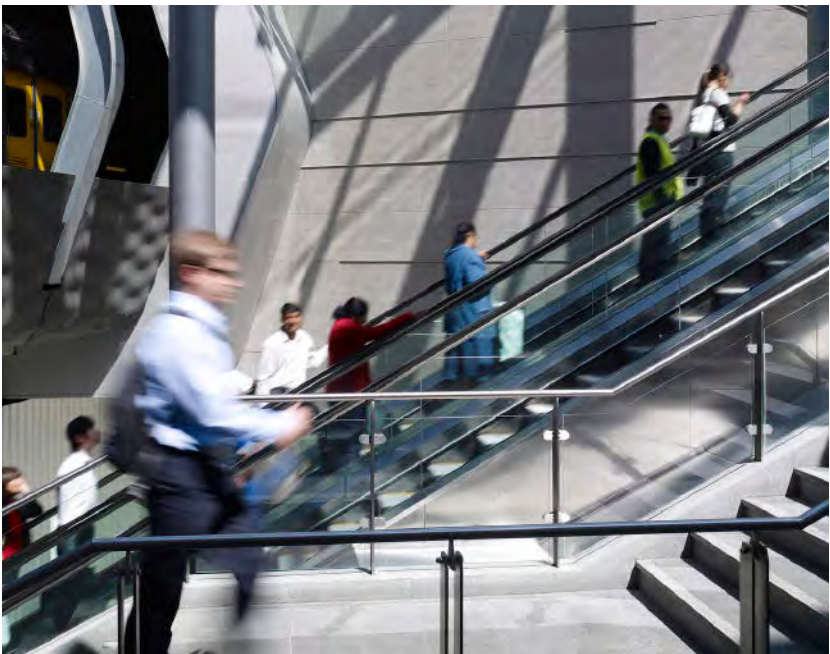
- Handrails and balustrades should guide safe customer movement and be consistent in material and quality line wide.

##### Waste Bins

- Bins should be consistent line-wide, including consideration of the locality and considerations below.
- The station design and management should ensure that, through the placement and maintenance of bins, cleanliness is maintained during operating hours.
- Bins are to be located to minimise the recurrence of litter, whilst considering the ambience and attractiveness of the station precinct.
- Facilitate waste separation and recycling.



Barangaroo, Sydney. The furniture and fixing colour palette should be coordinated with architectural elements, surface finishes and pavements.  
Architect: Tzannes Associates  
Source: TfNSW



Chatswood Station, Sydney, NSW. Example of handrail and stanchion  
Architect: CoxDesignInc.  
Source: Cox Richardson



# 4.2.4 Walls and Fences

## Relevant Design Objectives

1	Ensuring an easy customer experience
4	Being responsive to distinct contexts and communities
5	Delivering an enduring and sustainable legacy for Sydney

## Principle

*The vision for the design of wall and fencing elements is the development of a system which can be applied across the corridor and station sites with a high quality, robust and durable form that is representative of the Sydney Metro image and each station's context.*

## Guidelines

- The appearance and function of external walls and fencing is to be suitable for a rail environment and reinforce the Sydney Metro identity.
- Location, scale and articulation of external walls and fences are important elements of the public realm. Their design is to be an integral part of the urban design of station areas and corridor sites to minimise excessively long unarticulated lengths, inactive, bland and unappealing frontages.
- Wall and fencing systems and details are to respond to their location, function and acoustic environment.
- Ease of access, maintenance and replacement of walls and fencing sections is to be considered.
- Robust cladding materials and finishes are to be selected in response to the local environment and conditions, and sustainability objectives including dematerialisation and embodied energy.
- Feature walls are to be used to accentuate customer pathways and establish a strong architectural language at stations, employing artworks at appropriate sites.
- The materials palette should balance a calm and neutral quality with vibrant materials to aid wayfinding and accentuate movement.
- Use of colour/texture should assist in legibility and wayfinding.



Terracotta louvred facade provides a vibrant wall surface.  
Source: AECOM.



Glazed facades enable transparency and legibility.  
Architect: The Buchan Group  
Source: Apple

## 4.2.5 Earthworks and Engineered Structures

### Relevant Design Objectives

1	Ensuring an easy customer experience
4	Being responsive to distinct contexts and communities

### Principle

**Ensure earthworks and engineered structures such as noise walls, retaining walls and portals are visually integrated into their urban or landscape setting as much as possible, keeping engineered structures to a minimum.**

### Guidelines

#### Earthworks

- Dive structures at Marrickville and Chatswood may require cut embankments as a combination of engineered slopes and low retaining walls, to create an integrated, ‘sculpted’ landform, suited to the rail corridor setting.
- All earthworks are to sit lightly in their context, exhibiting a ‘natural fit’ within their landscape setting wherever possible.

#### Retaining Walls and Portals

- Retaining walls and related elements are to be designed as a unified composition and be integrated with the adjoining landscape (as appropriate) and other components such as fencing, guard rails, steps and other walls.
- The precautionary principle is to be adopted throughout so that retaining walls are only constructed where there is no other alternative.

#### Noise Walls

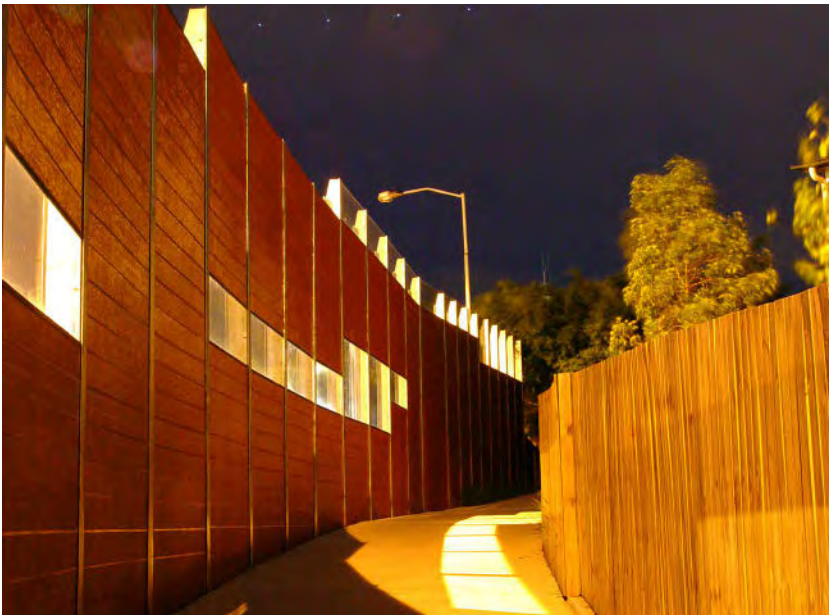
- Noise walls and retaining walls (where required) are to form a coordinated design system.
- Noise wall panels are to be comprised of robust, vandal-resistant materials and be resilient to damage by adjacent planting. Material and system selection to consider sustainability objectives including dematerialisation and embodied energy.
- Any noise walls are to be designed as part of a hierarchy of walls that includes retaining walls, abutments and parapet walls, such that each element appears to be visually coordinated.
- The apparent scale and visual impact of noise walls is to be reduced with careful planting, even when space is limited.

#### Bridges

- Design in accordance with the Bridge Aesthetics Design Guideline prepared by Roads and Maritime Services.



Gore Hill Freeway, Sydney. Provide retaining walls that are topped out by a consistent concrete capping beam.  
Source: AECOM.



When designing noise walls consider their visual impacts from both inside and outside of the rail corridor.  
Source: AECOM.



## 4.3 Operation and Services

The design of project infrastructure must be tailored to meet operational requirements and the transport function and integrity of the Metro system over the longer term. Design should also respond to the management and maintenance obligations that will be a critical part of the success of the Metro over successive generations as the greater Sydney region grows and demands on the transit services increase.

Stations, buildings, external areas and related corridor structures must be suitable for a high capacity passenger rail environment traversing a dense urban setting and a complexity of interfaces. The stations needs to have a consistent, reliable and bespoke series of facilities that assist both staff, servicing and security operations and meet the needs of the customers who will utilise the system on a daily or more infrequent basis.

This part of the guidelines relates to the following elements:

- Wayfinding and Signage
- Ticketing equipment and Fixtures
- Engineering and Services Integration
- Management and Maintenance
- Security
- Emergency Requirements
- Service Vehicle Access



Grand Concourse, Central Station. Transport Information with Passenger Information Display.  
Source: TfNSW



### 4.3.1 Wayfinding and Signage

**Relevant Design Objectives**

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system
4	Being responsive to distinct contexts and communities

**Principle**

*Provide intuitive, clear and consistent information and signage to enhance customer journeys through efficient navigation and interchange, creating a seamless and intuitive customer journey from origin to final destination.*

**Guidelines**

- All customer wayfinding and information signage must enable customers to navigate each station and precinct as part of a cohesive door-to-door journey.
- Information is to include, but not be limited to, information in trip planning; finding the right platform; making connections to another form of transport; destinations in the local precinct; ‘real time’ information for all public transport modes; wayfinding; facilities and amenities.
- A modern public address system is provided that is capable of projecting clear and audible information throughout the station.
- Advertising should not compromise wayfinding. The design and placement of customer information is prioritised as follows:
  - Wayfinding and customer information
  - Customer campaigns
  - Advertising



Circular Quay, Sydney. Signage and wayfinding enables clear sightlines of the interchange precinct.  
Source: TfNSW



### 4.3.2 Ticketing Equipment

Relevant Design Objectives

1	Ensuring an easy customer experience
2	Being part of a fully integrated transport system

Principle

*Provide ticketing equipment and fixtures that are integrated standard products across the Sydney Metro and Sydney Trains network and that contribute to quality and efficient service for customers.*

Guidelines

General

- Common ticketing equipment and fixtures include:
  - Ticket Gates
  - Ticket Vending Machines (TVMs) and Opal Top-up Machines
- Equipment and fixtures are to be high quality, consistent throughout the Sydney Metro network and fully integrated with the station design.
- All components are to be robust and durable, suitable for the rail environment.
- Equipment and fixtures are to be located where they are visible and accessible to customers and station staff for wayfinding, security and maintenance
- Materials and installation must enable ease of access for maintenance and future repairs or replacement

Ticket Gates

- Ticket gates should be standard products used line-wide that contribute to quality and efficient service for customers.
- Opal ticket gates are to be used. Provision should be made for accessible gates and glazed manual wide aisle gates to allow for large equipment and prams.
- The number of ticket gates provided is to be sufficient for peak periods
- Ticket gates are to be located to enable sufficient space for comfortable and safe queuing without interfering with circulation routes.
- Wide aisle gates are to be clearly visible and located on accessible paths of travel.

Ticket Vending and Opal Top-up Machines

- TVMs and Opal Top-up Machines are to be clustered together to provide a legible ticket sales zone within the station entrance, and designed to integrate with interior components, materials and information systems.
- TVMs and Opal Top-up Machines must be publicly accessible and close to the station entrance without interfering with circulation routes.
- TVM and Opal Top-up Machine arrangement are to provide adequate space for queuing and manoeuvring by customers using mobility aids.
- TVMs and Opal Top-up Machines should be proprietary standard items and be DDA compliant.



Sydney Trains Opal Only Gates  
Source: TfNSW

### 4.3.3 Engineering and Services Integration

#### Relevant Design Objectives

- |   |   |
|---|---|
| 1 | Ensuring an easy customer experience                  |
| 2 | Being part of a fully integrated transport system     |
| 4 | Being responsive to distinct contexts and communities |

#### Principle

*The rail engineering and service elements for the stations and service facilities should be integrated into the design holistically, whilst being able to be easily maintained.*

#### Guidelines

##### General

- The station structures and engineering elements are to be designed holistically, fusing architecture and engineering as one cohesive and compelling product.
- The station and station surrounds are to integrate all structural, civil, mechanical, electrical and rail systems to ensure efficient designs.
- Design integrity must be addressed through careful positioning of equipment.
- Minimise the visual impact of engineering components in public areas by concealing all services.
- Station and services design must allow for personnel access and regular maintenance of all engineering elements.
- Dedicated services zones should be integrated into the station designs allowing sufficient space proofing for future requirements.
- Expression of primary structural elements is to be considered.

##### Service Buildings

- Services buildings and facilities should form an integrated solution with the station architecture and precinct taking into account the scale, context and purpose of the structure.
- Similar materials and components as used in the station should be selected where appropriate to support the Sydney Metro identity.
- Opportunities to provide for active uses and frontages should take priority over service related structures.
- Elements in major urban settings need to consider impacts including visual, environmental and acoustic on the streetscape.
- Elements located in public areas of the station and surrounds are to be integrated with other functions such as public facilities, ticketing and information, fire stairs, community facilities or retail to minimise the impact of the services on the station precinct.
- Access for maintenance and replacement of plant and equipment should be considered including personnel access for regular maintenance tasks. Designs should allow for safe access and egress to all areas of services buildings.



King's Cross Square, London. Good example of a well designed vent structure integrated with other functions within an urban setting  
Architect: Stanton Williams  
Source: Getty



Macquarie Park Station. Services are concealed and integrated within the cavern structure, enabling the clean expression of the cavern form.  
Architect: Hassell  
Source: Cox Richardson



### 4.3.4 Management and Maintenance

**Relevant Design Objectives**

2	Being part of a fully integrated transport system
---	---

**Principle**

*Ensure the selection of cost effective, adaptable materials and assets that are durable and easily maintained and fit-for purpose for high traffic rail environments and customer interface.*

**Guidelines**

- Adopt a consistent and coordinated palette of materials, furniture and fixtures within stations and their precincts to promote cost effectiveness and assist in the development of an efficient management and maintenance plan for Sydney Metro.
- Proposed hard and soft landscaping elements within the external urban realm of stations are to comply with the standards of each local council area to facilitate consistent future management and maintenance regimes.
- Public domain elements external to stations, such as pavement materials, wall types, furniture and fixtures are to be consistent with the existing urban context for ease of maintenance.
- Hard landscaped surfaces and structures in some locations may have to be more durable to withstand the larger loads of and vibrations from specialist installation or maintenance vehicles, notwithstanding vibrations from above or below ground trains.
- All signage, street furniture and operational equipment (e.g. Passenger Information Displays (PIDs) and CCTVs systems) in the public domain are to be designed to minimise vandalism and simplify cleaning.
- Placement and detailing of furniture, fixtures and equipment should consider impacts by birds, insects and mammals on operational assets and the customer environment.
- All assets, including paving, lighting, signage and street furniture, are to be of a standardised modular design as far as practical that is readily available and have readily replaceable components.
- Materials, furniture, fittings and fixtures are to be selected and sized in a manner that allows easy installation and repair. All components should meet the required life cycle objectives of Sydney Metro and consider sustainability objectives including dematerialisation and embodied energy.
- Materials and finishes will be able to be easily cleaned and maintained with consideration for graffiti resistance in customer interface areas.

- Furniture, fixtures and fittings are to be robust and durable, with consideration of detailing and placement to resist vandalism.
- The design for each station is to accommodate future maintenance access to all elements, including components that may require the use of heavy or large machinery or structures to be erected for installation of structures and equipment, regular cleaning or repair.
- Stations and station precincts should be designed to facilitate access in a safe environment for operational staff and customers alike. Maintenance considerations are to be integral to the design process from an early stage.



Temporary or ancillary equipment, vending machines or any other structures (i.e. temporary signage) are not be placed in the primary pedestrian paths.  
*Source: Grimshaw.*

### 4.3.5 Security

#### Relevant Design Objectives

- 2
- Being part of a fully integrated transport system

#### Principle

**Ensure adequate security for the rail corridor infrastructure, station assets and their users. Visually integrate security elements such as fencing, security screens CCTV and lighting into the rail corridor, precinct or station design as part of a coordinated whole-of-corridor design.**

#### Guidelines

- Risks to the rail corridor and stations must be regularly assessed during the design phase to ensure adequate control measures can be put in place.
- A public address system is to be provided at emergency egress and risk points, controllable from Station Control Rooms and Operational Control Rooms.
- CCTV must be provided throughout the station.
- CCTV must be provided at all egress points and risk-sensitive areas.
- Security bollards may be provided where necessary but must not impede safe pedestrian movement. Where required, security bollards should adopt a rational layout in order to minimise visual clutter and maximise safe and accessible paths of travel.

#### Fencing and Gates

- Security fencing must be provided along the sections of the rail corridor not in tunnel and include permanent gated access at controlled locations. Fencing and gate locations are to be coordinated with strategic emergency access and egress points.
- The selection and detailing of fencing should be fully coordinated throughout the corridor and consist of modular components.
- Corridor fencing must not only respond to security considerations, but also respond to corridor context, including, for example, the provision for high quality fencing at station precincts.
- Security fencing types must be consistent throughout Sydney Metro and respond to the contextual environmental of the rail corridor, including provision for high quality fencing at station precincts where users experience the fencing close at hand and high security, more robust and utilitarian fencing at rail infrastructure/ facility locations.
- Fencing types must be robust, suitable to the rail environment and consider maintenance and future replacement.
- Fencing throughout the station precincts and public domain areas must avoid creating dead ends or sightline conflicts.

#### Lighting

- Lighting is to consider:
  - Natural daylight.
  - Emergency and exit lighting.
  - Interfaces with wall cladding, soffit systems and other visible services.
  - Consistency in design across all stations and precincts.
  - Ongoing access and maintenance - minimising the number of luminaire and lamp types and considering replacement processes.
  - Sustainability targets and energy usage.
  - Lighting levels sufficient for adequate operation of CCTV.



Homebush, Sydney. Rail corridor security fences should be robust, easily maintained, modular systems that are readily integrated with other urban design elements such as retaining walls.  
*Source: AECOM.*



### 4.3.6 Emergency Requirements

**Relevant Design Objectives**

- |   |   |
|---|---|
| 2 | Being part of a fully integrated transport system |
|---|---|

**Principle**

*Ensure that station precincts, facilities and rail corridors are provided with clearly identified zones for emergency access and egress, eliminating the potential for movement conflicts during emergencies.*

**Guidelines**

- The precincts and rail corridor should provide access for emergency service vehicles and appropriate measures to safeguard all users.
- All station precincts and public domain areas must comply with statutory requirements and emergency procedures and relevant guidelines for fire and safety.
- Emergency requirements are to consider;
  - Effective and clearly signposted station emergency evacuation routes and assembly areas.
  - Adequate zoning and space at emergency assembly points to ensure they are free of clutter and remain accessible at all times.
  - Fire safe refuge areas with CCTV and accessible communication system in underground stations for people who are unable to self-evacuate.
  - Full integration within the relevant station and facilities evacuation plan.
  - Emergency lighting to the immediate station curtilage.
  - The appropriate location of firefighting equipment such as hydrants; all clearly identified and readily accessible.
  - The provision of emergency/security electronic help points.

**Hydrant Enclosures**

- Hydrant enclosures should be easily identifiable, easily accessed modular components integrated into station cladding systems.
- Hydrant enclosures should be integrated with the surrounding wall system to minimise their visual impact.



All station precincts must accommodate station evacuation and emergency procedures.  
Source: AECOM.

### 4.3.7 Service Vehicle Access

#### Relevant Design Objectives

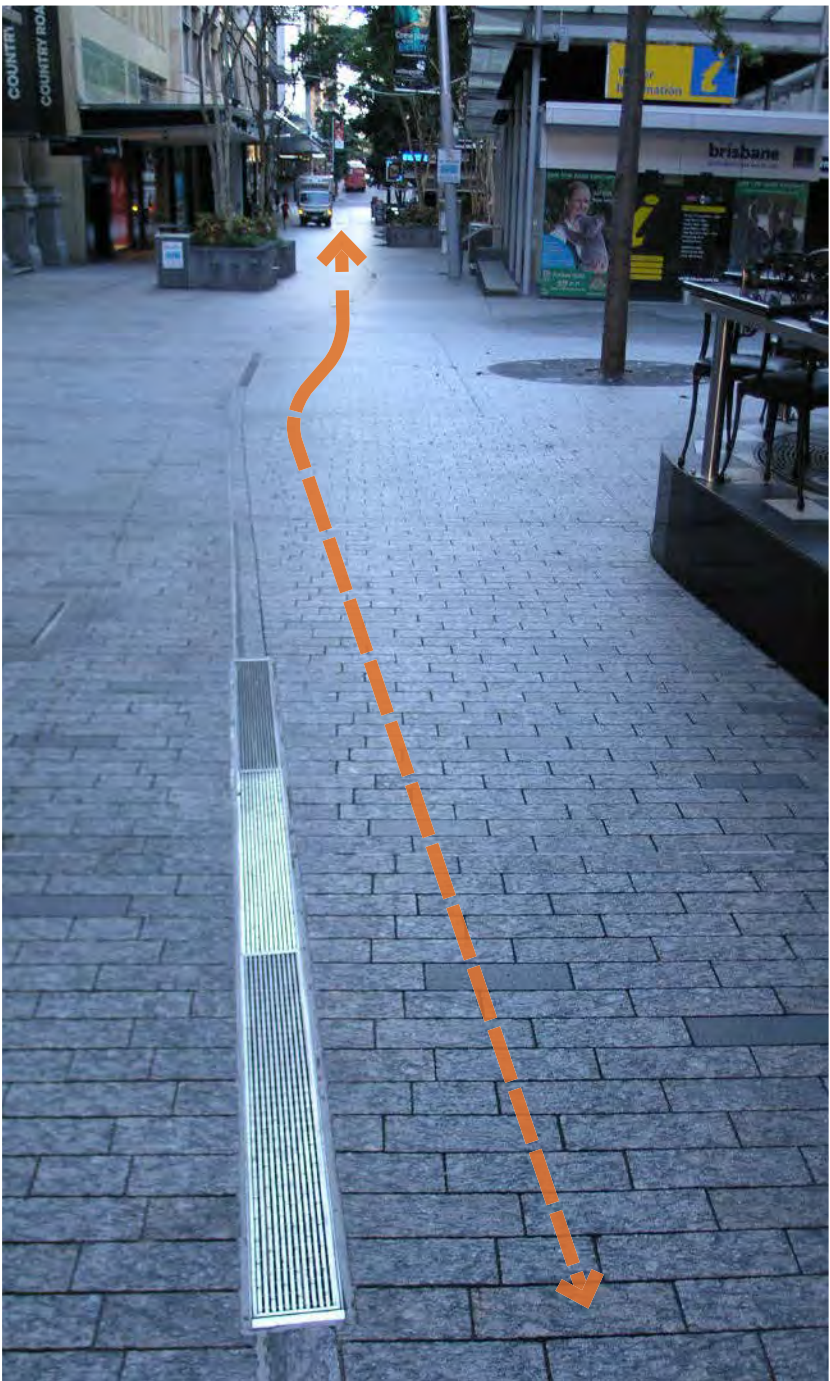
2	Being part of a fully integrated transport system
4	Being responsive to distinct contexts and communities

#### Principle

*Ensure well defined and efficient coordination of service vehicle movements within precincts.*

#### Guidelines

- The station design is to enable access for service vehicles. Service vehicle access is not to compromise the public domain areas of the station forecourt or interchange and connectivity functions.
- Service vehicle access for all precinct functions must be addressed as part of the broader station precinct movement strategies. These strategies must address both the project works requirements and increased movements over the life of the station precincts.
- The operational function and frequency of service vehicles should be considered to determine dedicated zones for daily or frequent access, or shared zones for occasional access within station precincts. Multi-use conflicts in shared zones should be eliminated.



Queen St Mall, Brisbane. Emergency vehicle and service vehicle access through the mall has been provided.  
Source: AECOM.



## 4.4 Specific Elements

There are specific elements along the Sydney Metro corridor that are not adequately addressed in the general design guidelines due to their specialised or sensitive nature. To ensure they meet high quality design outcomes, these elements require additional unique design guidelines which are identified in this section.

A brief description of the context for specific elements is provided, followed by a series of specific guidelines for that element.

Specific elements in the Chatswood to Sydenham project considered in this part of the document include:

- Sydney Yard Access Bridge
- Central Walk
- Sydney Metro Trains Facility - South
- Sydenham Aqueduct



Central Station Clock Tower  
Source: TfNSW

## 4.4.1 Sydney Yard Access Bridge

### Context

The proposed bridge is located off Regent Street, Chippendale, south of Central Station, north of Cleveland Street and to the east of the Mortuary Station, in the southern sector of the Sydney Yard. The bridge will provide vehicular access to the Sydney Yard during the construction of the Sydney Metro station box and as a permanent access solution to Sydney Yard following the removal of the existing vehicular access from Eddy Avenue.

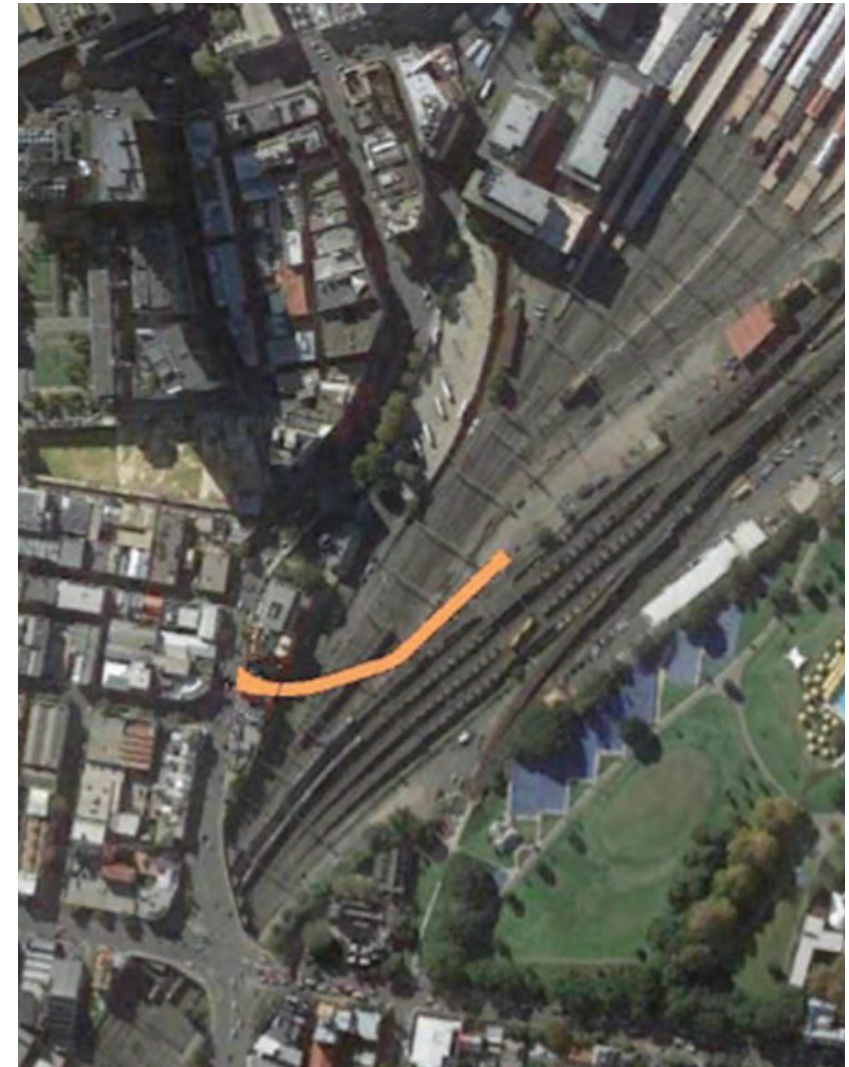
### Principle

***The bridge will be of a high architectural and urban design quality, utilising structures, forms and materials that respond to and respect the industrial rail context and aesthetic of the Sydney Yard and setting of Mortuary Station.***

### Guidelines

- The design shall be visually unobtrusive and minimise adverse impacts on existing views of significant heritage and provide wide and clear spans over the tracks.
- The bridge shall minimise impacts on the heritage values of Sydney Terminal and Central Railway Stations Group, the Chippendale Heritage Conservation Area (HCA), the Mortuary Station or the former Co-Masonic Temple.
- The bridge shall demonstrate best practice in integrated bridge engineering, architectural and urban design and construction.
- The bridge shall have a low profile form with shallow deck and low super-structure; with low profile parapet, edge beams, and traffic barriers.
- The bridge approach to Regent Street shall be designed to integrate with the surrounding context and minimise the visual intrusion onto the streetscape.

- The entry driveway and access site off Regent Street is to ensure pedestrian safety and good sightlines across the vehicular driveway; allowing for a pedestrian pavement that continues across the driveway without a kerb or step.
- Landscape screening of dense hedge planting and/or climbing plants shall be provided to adjacent buildings and vertical surfaces to deter graffiti.
- Low maintenance native landscaping together with medium-sized native trees shall be provided to the residual spaces between the approach ramp and the site boundaries to soften the appearance of the site from Regent Street.
- The abutments shall be sympathetic to the existing surrounding viaducts, with bridge piers incorporated within the envelope of the bridge.
- All screens, balustrades and fences shall be light weight and visually consistent in their aesthetic appearance.
- The bridge shall have no signage or advertising.
- Lighting of the bridge shall be inconspicuous and to minimise spill lighting into the adjacent public domain or Mortuary Station and must also not distract train drivers.



Sydney Yard Access Bridge - indicative location plan



## 4.4.2 Central Walk

### Context

Central Station is a public landmark, heritage building and the largest transport interchange in NSW. Managing the complex heritage values of the place, while providing for the evolving needs of customers and seamless integration into the surrounding precincts, presents a unique challenge and once in a lifetime opportunity.

Central Walk represents a major intervention in Central Station and will fundamentally change the passenger circulation routes and how customers perceive their journey.

It brings major opportunities to improve the functionality of Central Station and to provide a sense of order and space throughout a constant level to better connect between transport modes and the surrounding areas.

Successful implementation of Central Walk will require design solutions that are sensitive to Central Station and its context, responsive to the changing environment and of a quality aligned with the importance of Central Station to Sydney.

### Principle

***Integrate Central Station with its surrounding context with seamless and intuitive connections that reinforce Central as a world class integrated transport interchange and gateway to the city.***

### Guidelines

#### General

- Wayfinding is to be seamless and intuitive, and support an effortless customer experience
- Customer circulation paths are to optimise timeliness for customers moving between concourse, platform, and other transport modes.
- Provide efficient and safe access through good sightlines, generous circulation and open and spacious planning
- Provide sufficient space for emergency access and movements in accordance with relevant design standards and legislation.

- Advertising is not to compromise wayfinding. The design and placement of customer information is to be prioritised as follows:
  - Wayfinding and customer information
  - Customer campaigns
  - Advertising
- All finishes are to be safe and robust, suitable for the station environment.

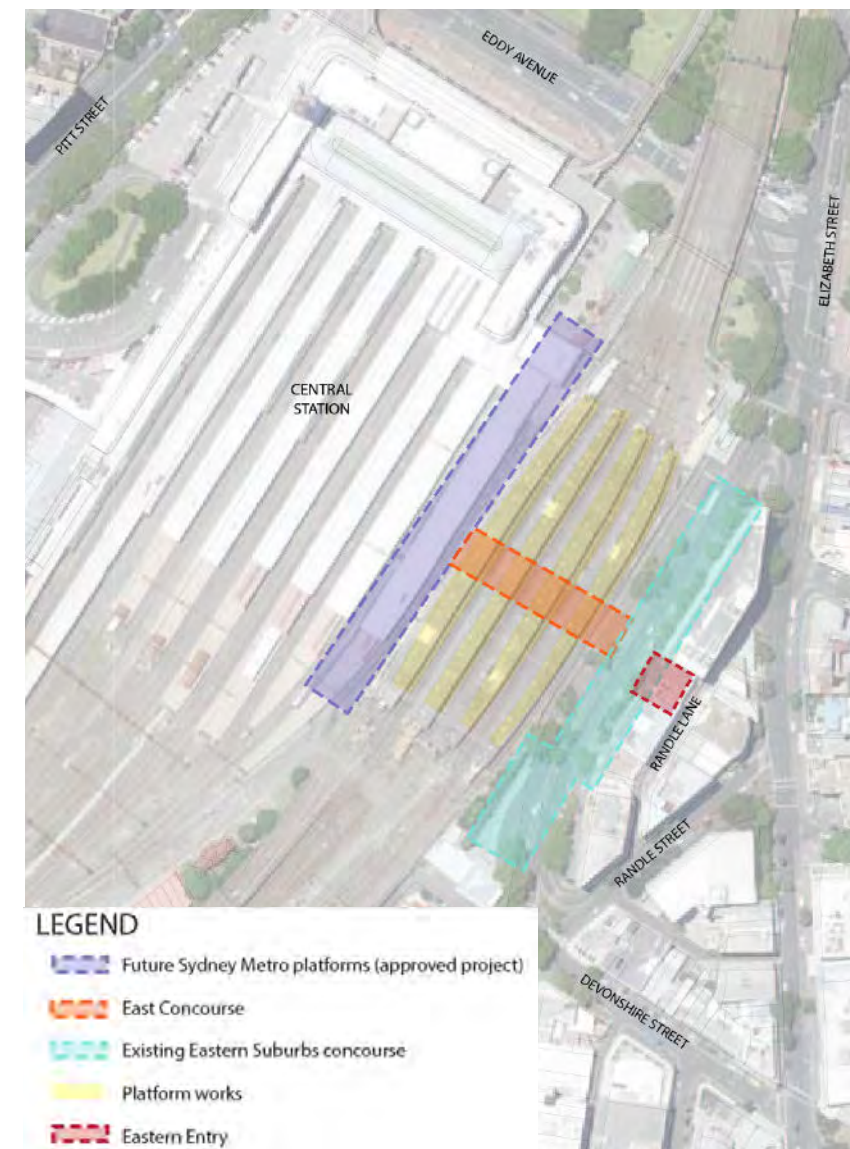
#### Concourse and entry

- Create a sense of place and belonging through welcoming and attractive spaces that enhance pedestrian connectivity and activity
- Be responsive to Central Station and surrounding urban context by respecting the scale and heritage character of existing buildings and structures
- Link the future Metro station with the existing Eastern Suburbs concourse with a contemporary below ground connection.
- Retain the eastern brick boundary wall on Chalmers Street.
- The eastern entry is to allow effective and timely interchange between pedestrians, bicycle users, light rail, suburban and Metro rail services, with pedestrian flow occurring without friction.
- The eastern entry must be clearly identifiable at street level and from approaching pedestrian routes.
- The east concourse design must support visible staff presence as close as possible to customer decision making zones
- The entry paths at street level are to enable safe crossing of the future Chalmers Street cycleway.

#### Suburban platforms

- Ensure platforms are free of recesses and indentations which could offer hiding places and litter traps, disrupt continuous paths of travel for the visually impaired and hinder CCTV coverage
- Minimise structures and columns on platforms to maximise sightlines and customer waiting and circulation space

- Design to enable easy, safe and accessible for all to use including the elderly, customers with disabilities, young children and those with prams and luggage
- Ensure the safety of customers by optimising the space between a barrier and the platform edge where new lifts or escalators are introduced
- Priority seats and adequate space are to be provided around groups of seating to accommodate the elderly, and customers with disabilities and prams



Central Walk - indicative plan

### 4.4.3 Sydenham Aqueduct

#### Context

The Sydenham Pit and Pumping Station are situated approximately 6km south of the Sydney CBD in the Inner West Council (formerly Marrickville) local government area. The pit lies immediately northeast of Sydenham Station and is bordered by the rail alignment on its southern boundary. North, east and west of the Pit land uses are typically industrial and commercial.

The pit infrastructure consists of the stormwater retention reservoir, the Eastern Drainage Channel and the Drainage Pumping Station. New track alignment between the station and the proposed Sydney Metro Stabling Facility clashes with the alignment of the existing Eastern Drainage Channel. It is proposed to replace the channel with a closed aqueduct spanning the southern side of the pit. The aqueduct and a new pumping station will significantly increase the capacity of the drainage system.

The Sydenham Pit and Pumping Station are listed on the State Heritage Register. A design response will be required that is highly sensitive to the heritage values of the Pit and Pumping Station.

#### Principle - Heritage

***The design of new elements must only be undertaken with a full understanding of the heritage values of the site and with reference to the Sydenham Pit and Drainage Pumping Station No. 1 Draft Conservation Management Plan 2004.***

#### Guidelines

- The design of the aqueduct structure should be of a minimalist form, using simple forms and restrained but well resolved detailing.
- The aqueduct balustrade and any necessary vehicle barriers must be as transparent as practicable.
- The location of the aqueduct structure must ensure adequate physical separation from the Drainage Pumping Station so the building and its supporting piers are legible as a discrete structure on the edge of the pit when viewed from the northern and western sides of the site.
- Any required modifications of the pit wall and floor should be sensitively reconstructed to minimise its visual interference with the existing pit.
- The new pumphouse must be designed and sited in such a way that does not diminish the primacy of the original pumping station.
- The new pumphouse must be a simple yet distinctive work of contemporary architecture.

#### Principle - Access and Circulation

***The design of new infrastructure at the Sydenham Pit will safely and efficiently reconcile pit maintenance access and public access and connectivity in the precinct.***

#### Guidelines

- Any maintenance access structures to the pit should be designed and constructed to minimise its visual presence within the surrounding context of the pit.
- The aqueduct design must provide the services required for its use for a range of potential public activities and gathering, such as markets and public performances.
- The design must ensure a safe, attractive and relatively seamless public/pedestrian connection between the aqueduct and the proposed northern Metro entry to Sydenham Station.
- The aqueduct design must ensure accessible pedestrian and cycling connection between Railway Parade and aqueduct (at the higher level) and Garden Street.

#### LEGEND

-  Metro station entry
-  Station development site boundary
-  Sydenham Aqueduct
-  Existing Pumping Station Building
-  Planned Pumping Station Building
-  Access ramp to pit/ top of culvert



Sydenham Aqueduct - indicative plan



## 4.4.4 Sydney Metro Trains Facility - South

### Context

Sydney Metro Trains Facility - South lies approximately 6km south of the Sydney CBD and is located adjacent to the suburb of Marrickville, which falls within the Inner West Council (formerly Marrickville) Local Government Area. The suburb is bounded by Dulwich Hill to the west, St Peters and Sydenham to the east, Enmore to the north and Tempe to the south.

Land use around the proposed Sydney Metro Trains Facility - South is primarily made up of commercial and industrial areas that generally date from the late 19th century and early 20th century, and later industrial areas to the north.

The site is bound by Edinburgh Road and Sydney Steel Road to the north and west, the rail corridor to the west, and the state heritage listed Sydenham Pit to the south.

### Principle

***Provide a stabling facility and adjoining streetscapes that is sensitively integrated with the surrounding context, creating attractive shaded and pedestrian friendly streets, sustainable buildings, and functional staff facilities.***

### Guidelines

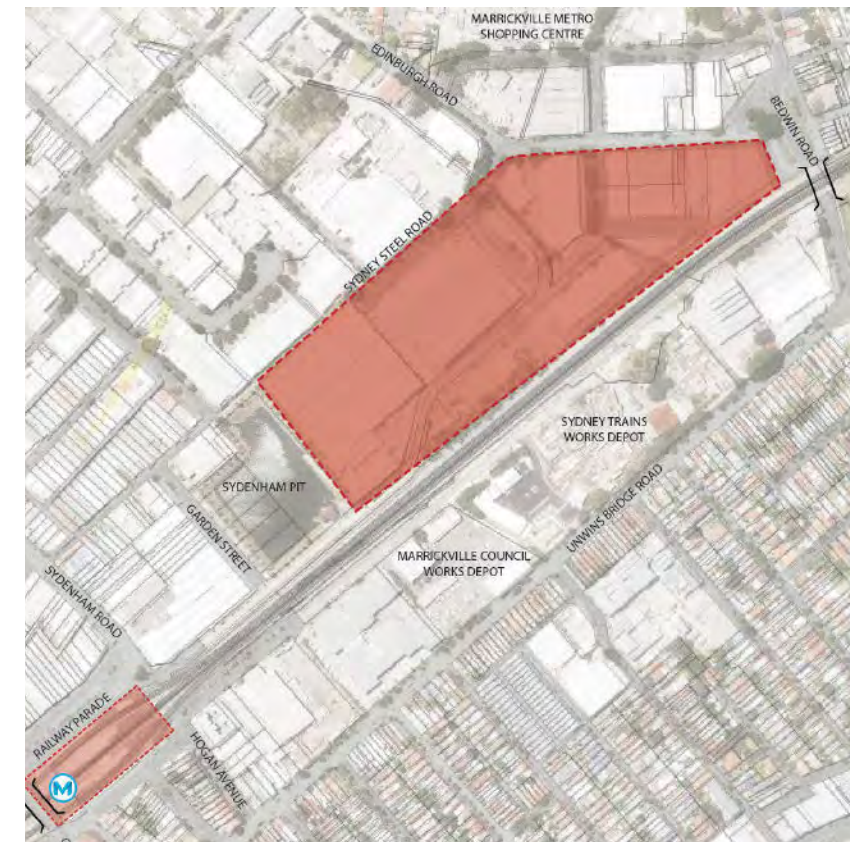
#### Landscape and Public Domain

- The areas of soft landscaping around the Administration building is maximised. The building and hard scape areas around the administration building and carpark must be consolidated as much as possible, maximise the opportunity for soft landscaping. These planted areas are intended to improve visual amenity, provide space for staff function and use, and allow areas for surface water run-off to be directed into.
- The areas of hard surfaces within the stabling facility is to be minimised. This is to reduce heat absorption and the general heat island effect, increase permeable surfaces and reduce water run-off, and improve general amenity within the facility.

- Maximise street trees and landscape verge areas to Sydney Steel Road and Edinburgh Street. A high quality landscape treatment is required to the frontage of the facility to provide general amenity to the streetscape and visual screening of the facility. This is to be achieved through street tree planting, grass and understorey planting to verges areas, and high quality materials to footpaths and pavements.
- Enable pedestrian and cycle connection along the frontage of the stabling facility on Sydney Steel Road and Edinburgh Road, to provide connectivity and access to the wider precinct for pedestrians and cyclists commuting to and from Sydenham Station.

#### Administration Building

- The building must be oriented to maximise daylight into the building, as well as providing operational visibility over the facility. This is so to reduce lighting energy consumption, to enhance office staff enjoyment / comfort levels, and to shield to building from negative solar heat gain.
- Provide on-site low voltage power regeneration via roof mounted photovoltaic cells.
- Achieve water use reduction in the building through rain water harvesting and re-use, and use of water efficient fixtures.
- Mitigate the heat absorption through the inclusion of plantings, permeable or white reflective surfaces around the building.
- Consider the use of recycled materials including recycled concrete where possible.



Sydney Metro Trains Facility, South - indicative location plan





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# **TRAFFIC AND TRANSPORT TECHNICAL INFORMATION**

APPENDIX C





## Traffic and transport technical appendix

### Modelled intersection performance – primary haul route

Peak period	Existing				Approved project				Approved project plus proposed modification			
	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation
<b>Cleveland Street / South Dowling Street**</b>												
Morning	4,286	>100	F	>1.00	4,336	>100	F	>1.00	4,492	>100	F	>1.00
Evening	4,255	>100	F	>1.00	4,289	>100	F	>1.00	4,475	>100	F	>1.00
<b>Cleveland Street / Bourke Street**</b>												
Morning	2,779	22	B	0.83	2,829	22	B	0.84	2,985	23	B	0.87
Evening	3,020	27	B	0.87	3,054	27	B	0.88	3,240	34	C	0.97
<b>Cleveland Street / Crown Street / Baptist Street**</b>												
Morning	3,024	88	F	>1.00	3,074	87	F	>1.00	3,230	87	F	>1.00
Evening	3,101	88	F	>1.00	3,135	87	F	>1.00	3,321	89	F	>1.00
<b>Cleveland Street / Marlborough Street / Young Street**</b>												
Morning	2,565	8	A	0.49	2,615	8	A	0.51	2,771	8	A	0.57
Evening	2,628	11	A	0.53	2,662	11	A	0.53	2,848	11	A	0.60



Peak period	Existing				Approved project				Approved project plus proposed modification			
	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation
<b>Cleveland Street / Wilton Street / Walker Street**</b>												
Morning	2,699	22	B	>1.00	2,749	23	B	>1.00	2,905	22	B	>1.00
Evening	2,655	11	A	0.58	2,689	11	A	0.58	2,875	11	A	0.61
<b>Cleveland Street / Elizabeth Street**</b>												
Morning	3,814	>100	F	>1.00	3,864	>100	F	>1.00	4,020	>100	F	>1.00
Evening	4,091	89	F	>1.00	4,125	88	F	>1.00	4,311	>100	F	>1.00
<b>Cleveland Street / Chalmers Street**</b>												
Morning	4,530	>100	F	>1.00	4,580	>100	F	>1.00	4,737	>100	F	>1.00
Evening	4,278	>100	F	>1.00	4,312	>100	F	>1.00	4,498	>100	F	>1.00
<b>Chalmers Street / Randle Street / Devonshire Street*</b>												
Morning	1,759	15	B	0.73	1,784	15	B	0.73	1,862	15	B	0.73
Evening	1,386	12	A	0.64	1,403	12	A	0.64	1,496	12	A	0.64
<b>Elizabeth Street / Randle Street*</b>												
Morning	2,630	3	A	0.49	2,655	3	A	0.49	2,733	3	A	0.49
Evening	2,902	3	A	0.57	2,919	6	A	0.57	3,012	6	A	0.57

Peak period	Existing				Approved project				Approved project plus proposed modification			
	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation
<b>Elizabeth Street / Chalmers Street / Foveaux Street / Eddy Avenue*</b>												
Morning	4,597	>100	F	>1.00	4,622	>100	F	>1.00	4,700	>100	F	>1.00
Evening	5,222	>100	F	>1.00	5,239	>100	F	>1.00	5,332	>100	F	>1.00
<b>Eddy Avenue / Pitt Street / Rawson Place*</b>												
Morning	3,284	>100	F	>1.00	3,309	>100	F	>1.00	3,387	>100	F	>1.00
Evening	3,701	>100	F	>1.00	3,718	>100	F	>1.00	3,811	>100	F	>1.00
<b>George Street / Lee Street / Pitt Street / Quay Street*</b>												
Morning	4,055	62	E	>1.00	4,080	61	E	>1.00	4,158	61	E	>1.00
Evening	4,469	96	F	>1.00	4,486	97	F	>1.00	4,579	97	F	>1.00
<b>Lee Street / Regent Street*</b>												
Morning	3,054	24	B	0.79	3,079	24	B	0.79	3,157	25	B	0.79
Evening	3,052	21	B	0.83	3,069	21	B	0.83	3,162	21	B	0.83
<b>Regent Street / Kensington Street*</b>												
Morning	2,901	7	A	0.54	2,926	7	A	0.54	3,004	7	A	0.57
Evening	2,913	8	A	0.72	2,930	8	A	0.72	3,023	9	A	0.72
<b>Cleveland Street / Regent Street*</b>												
Morning	6,566	80	F	>1.00	6,641 <sup>w</sup>	>100	F	>1.00	6,719 <sup>w</sup>	>100	F	>1.00
Evening	6,630	>100	F	>1.00	6,681 <sup>w</sup>	>100	F	>1.00	6,774 <sup>w</sup>	>100	F	>1.00



Peak period	Existing				Approved project				Approved project plus proposed modification			
	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation
<b>Cleveland Street / George Street*</b>												
Morning	3,119	9	A	0.62	3,144	9	A	0.62	3,222	7	A	0.63
Evening	3,288	8	A	0.71	3,305	8	A	0.71	3,398	8	A	0.70
<b>Cleveland Street / Pitt Street*</b>												
Morning	3,171	36	C	>1.00	3,196	37	C	>1.00	3,274	38	C	>1.00
Evening	3,313	16	B	0.75	3,330	16	B	0.75	3,423	16	B	0.75

Note: Morning peak hour is 7:30 am to 8:30 am and evening peak hour is 4:30 pm to 5:30 pm

\*Construction vehicles travel through intersection in one direction: Approved Sydney Metro works only = 25 pcu in the morning and 17 pcu in the evening, Central Walk plus Sydney Metro (Central Station works) = 103 pcu in the morning and 110 pcu in the evening

\*\*Construction vehicles travel through intersection in two directions: Approved Sydney Metro works only = 50 pcu in the morning and 34 pcu in the evening, Central Walk plus Sydney Metro (Central Station works) = 206 pcu in the morning and 220 pcu in the evening

<sup>w</sup> includes construction vehicles due to Sydney Metro (Waterloo Station works) = 50 pcu in the morning and 34 pcu in the evening in two directions

## Modelled intersection performance – secondary haul route

Peak period	Existing				Approved project				Approved project plus proposed modification			
	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation
<b>Western Distributor / Bank Street*</b>												
Morning	1,463	40	C	0.91	1,488	45	D	0.95	1,566	79	F	>1.00
Evening	1,250	59	E	1.00	1,267	60	E	>1.00	1,360	>100	F	>1.00
<b>Western Distributor / Pymont Bridge Road / Bank Street*</b>												
Morning	3,451	72	F	>1.00	3,476	72	F	>1.00	3,554	74	F	>1.00
Evening	3,085	>100	F	>1.00	3,102	>100	F	>1.00	3,195	>100	F	>1.00
<b>Pymont Bridge Road / Bridge Road / Wattle Street*</b>												
Morning	3,014	>100	F	>1.00	3,039	>100	F	>1.00	3,117	>100	F	>1.00
Evening	2,761	>100	F	>1.00	2,778	>100	F	>1.00	2,871	>100	F	>1.00
<b>Western Distributor / Harris Street / Fig Street*</b>												
Morning	4,013	>100	F	>1.00	4,038	>100	F	>1.00	4,116	>100	F	>1.00
Evening	4,152	>100	F	>1.00	4,169	>100	F	>1.00	4,262	>100	F	>1.00
<b>Harris Street / Quarry Street*</b>												
Morning	2,686	20	B	0.72	2,711	20	B	0.72	2,789	19	B	0.72
Evening	2,861	26	B	0.80	2,878	26	B	0.80	2,971	28	B	0.80



Peak period	Existing				Approved project				Approved project plus proposed modification			
	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation
<b>Harris Street / William Henry Street*</b>												
Morning	4,062	31	C	0.96	4,087	31	C	0.96	4,165	32	C	0.96
Evening	4,129	27	B	0.83	4,146	27	B	0.83	4,239	28	B	0.83
<b>Harris Street / Macarthur Street*</b>												
Morning	2,501	7	A	0.73	2,526	7	A	0.73	2,604	7	A	0.73
Evening	2,722	23	B	>1.00	2,739	23	B	0.87	2,832	18	B	0.87
<b>Harris Street / Mary Ann Street*</b>												
Morning	2,565	11	A	0.70	2,590	10	A	0.69	2,668	10	A	0.69
Evening	2,849	21	B	0.82	2,866	21	B	0.86	2,959	20	B	0.87
<b>Harris Street / Ultimo Road*</b>												
Morning	2,662	22	B	0.94	2,687	22	B	0.94	2,765	21	B	0.94
Evening	3,199	63	E	>1.00	3,216	63	E	>1.00	3,309	61	E	>1.00
<b>Harris Street / Thomas Street*</b>												
Morning	2,463	11	A	0.87	2,488	11	A	0.87	2,566	11	A	0.87
Evening	2,863	17	B	0.96	2,880	17	B	0.95	2,973	17	B	0.95

Peak period	Existing				Approved project				Approved project plus proposed modification			
	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation
<b>George Street / Harris Street / Regent Street / Broadway**</b>												
Morning	5,179	>100	F	>1.00	5,229	>100	F	>1.00	5,385	>100	F	>1.00
Evening	6,031	93	F	>1.00	6,065	97	F	>1.00	6,251	>100	F	>1.00
<b>Lee Street / Regent Street*</b>												
Morning	3,054	24	B	0.79	3,079	23	B	0.79	3,157	23	B	0.80
Evening	3,052	21	B	0.83	3,069	21	B	0.83	3,162	25	B	0.83
<b>Regent Street / Kensington Street*</b>												
Morning	2,901	7	A	0.54	2,926	6	A	0.54	3,004	6	A	0.52
Evening	2,913	8	A	0.72	2,930	8	A	0.72	3,023	8	A	0.72
<b>Cleveland Street / Regent Street *</b>												
Morning	6,566	80	F	>1.00	6,641 <sup>W</sup>	99	F	>1.00	6,719 <sup>W</sup>	>100	F	>1.00
Evening	6,630	>100	F	>1.00	6,681 <sup>W</sup>	>100	F	>1.00	6,774 <sup>W</sup>	>100	F	>1.00
<b>Cleveland Street / George Street*</b>												
Morning	3,119	9	A	0.62	3,144	8	A	0.62	3,222	8	A	0.63
Evening	3,288	8	A	0.71	3,305	8	A	0.71	3,398	8	A	0.71



Peak period	Existing				Approved project				Approved project plus proposed modification			
	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation
<b>Cleveland Street / Pitt Street*</b>												
Morning	3,171	36	C	>1.00	3,196	36	C	>1.00	3,274	36	C	>1.00
Evening	3,313	16	B	0.75	3,330	16	B	0.75	3,423	16	B	0.75
<b>Cleveland Street / Chalmers Street*</b>												
Morning	4,530	>100	F	>1.00	4,555	>100	F	>1.00	4,633	>100	F	>1.00
Evening	4,278	>100	F	>1.00	4,295	>100	F	>1.00	4,388	>100	F	>1.00
<b>Chalmers Street / Randle Street / Devonshire Street*</b>												
Morning	1,759	15	B	0.73	1,784	15	B	0.73	1,862	15	B	0.73
Evening	1,386	12	A	0.64	1,403	12	A	0.64	1,496	12	A	0.64
<b>Elizabeth Street / Randle Street*</b>												
Morning	2,630	3	A	0.49	2,655	3	A	0.49	2,733	3	A	0.49
Evening	2,902	3	A	0.57	2,919	6	A	0.57	3,012	6	A	0.57
<b>Elizabeth Street / Chalmers Street / Foveaux Street / Eddy Avenue*</b>												
Morning	4,597	>100	F	>1.00	4,622	>100	F	>1.00	4,700	>100	F	>1.00
Evening	5,222	>100	F	>1.00	5,239	>100	F	>1.00	5,332	>100	F	>1.00

Peak period	Existing				Approved project				Approved project plus proposed modification			
	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation	Demand flow (PCUs per hour)	Average vehicle delay (seconds)	Level of Service	Degree of Saturation
<b>Eddy Avenue / Pitt Street / Rawson Place*</b>												
Morning	3,284	>100	F	>1.00	3,309	>100	F	>1.00	3,387	>100	F	>1.00
Evening	3,701	>100	F	>1.00	3,718	>100	F	>1.00	3,811	>100	F	>1.00
<b>George Street / Lee Street / Pitt Street / Quay Street*</b>												
Morning	4,055	62	E	>1.00	4,080	61	E	>1.00	4,158	58	E	>1.00
Evening	4,469	96	F	>1.00	4,486	96	F	>1.00	4,579	90	F	>1.00
<b>Broadway / Chippendale Way*</b>												
Morning	3,157	6	A	0.38	3,182	6	A	0.38	3,260	6	A	0.38
Evening	3,842	10	A	0.71	3,859	10	A	0.71	3,952	10	A	0.71
<b>Broadway / Wattle Street / Abercrombie Street*</b>												
Morning	5,468	>100	F	>1.00	5,493	>100	F	>1.00	5,571	>100	F	>1.00
Evening	5,940	>100	F	>1.00	5,957	>100	F	>1.00	6,050	>100	F	>1.00

Note: Morning peak hour is 7:30 am to 8:30 am and evening peak hour is 4:30 pm to 5:30 pm

\*Construction vehicles travel through intersection in one direction: Approved Sydney Metro works only = 25 pcu in the morning and 17 pcu in the evening, Central Walk plus Sydney Metro (Central Station works) = 103 pcu in the morning and 110 pcu in the evening

\*\*Construction vehicles travel through intersection in two directions: Approved Sydney Metro works only = 50 pcu in the morning and 34 pcu in the evening, Central Walk plus Sydney Metro (Central Station works) = 206 pcu in the morning and 220 pcu in the evening

<sup>w</sup> includes construction vehicles due to Sydney Metro (Waterloo Station works) = 50 pcu in the morning and 34 pcu in the evening in two directions





# **NON-ABORIGINAL HERITAGE TECHNICAL INFORMATION**


APPENDIX E





# Non-Aboriginal heritage technical information

## Sydney Terminal and Central Railway Station Group

Sydney Terminal and Central Railway Station Group	
Image	<p>Sydney Terminal and Central Railway Station Group. Artefact Heritage 2015.</p> 
Significance	State
Description and statement of significance	<p>Central Station is the largest railway station and transport interchange in NSW and is of State significance for its historical, aesthetic, technical values and for its research potential. With its grand sandstone edifices and approaches it is a well-known landmark in Sydney.</p> <p>The site contains the original Sydney Railway Company grant on which the first Sydney Station and yards were opened, in 1855, and so represents over 150 years of railway operations in the same place, making it the oldest and the longest continuously operated yard in Australia.</p> <p>The Sydney Terminal precinct has a high level of historic significance associated with its early government and institutional uses, as well as being the site of Sydney's second major burial ground, the Devonshire Street cemetery. Archaeological evidence of the government and institutional uses is rare and has high research potential.</p> <p>Central Station site contains evidence of the first phase of railway construction in NSW and has been the major hub of rail transportation in NSW since the mid-19th century and has the ability to demonstrate the evolution of changes in the NSW railways and in railway technology over the past 150 years, from steam to electric, reflected in the changes in yard layout and in signalling work practices. The Darling Harbour branch line and associated sandstone Ultimo Railway Overbridge is the only remaining example of railway infrastructure built for the Sydney Railway Company and is the oldest piece of railway infrastructure in NSW. The Prince Alfred Sidings contains some of the oldest remaining workshops in the NSW railway system. The Prince Alfred Substation is part of the Bradfield 1926 electrification works and was designed by Bradfield</p>



### Sydney Terminal and Central Railway Station Group

himself. The site has technical heritage value in such elements as: the Darling Harbour Dive; Central Electrics flyovers; the elliptical arch construction of the Elizabeth Street Viaduct; the western approach ramp underbridge the three pin truss roof of the porte-cochère; the Devonshire Street subway (probably the first of its type in Australia); the underground men's toilets; and the early mail, parcels and luggage subway system.

The main terminus building, accentuated by its clock tower and approach ramps, exemplifies the predominant use of sandstone at the site and it has been sited to dominate its surroundings and to mark the importance of the railway to both the city and the State. The construction of the Sydney Terminus was the largest planned intervention into the urban fabric of Sydney at the time and it was the only major complex of the period where the urban setting was consciously designed to enhance and provide views to and from the main structure. With its multi layered access modes and above ground level platforms, not only was the development extraordinarily innovative but also the largest incursion into the southern part of Sydney prior to World War I.

Some of Sydney's most notable 19th and 20th century architects and engineers have worked on the Central Station site, including: James Wallace and William Randle who together designed and built the first railway from Sydney to Parramatta and the associated Darling Harbour Branch Line; the last serving Colonial Architect, James Barnet (Mortuary Station); the first NSW Government Architect, Walter Liberty Vernon (the main Terminus building and the Parcels Post Office); and the Chief Engineer for the City Underground and Sydney Harbour Bridge, Dr John Jacob Crew Bradfield (Central Electric). Mortuary Station, the main terminus building and the Parcels Post Office were the only designs undertaken for the NSW Railways by the Colonial Architect and the Government Architect within the Department of Public Works.

The main terminus building, constructed primarily in the early 20th century, is enhanced by its Neo-classical architectural features together with the high quality workmanship and materials it contains, from carved sandstone, marble and terrazzo to cedar joinery, acid etched glazing and metalwork balustrades.

The same fine quality in design, materials and workmanship is seen in Mortuary Station, the Railway Institute and also in the Neo-classical Chalmers Street Entrance, the Central Electric Station main façade and the Parcels Post Office, all of which tends to unify these buildings with the main terminus.

The Mortuary Station is a fine and rare example by James Barnet of the Gothic Revival architectural style and is the only remaining example of a mortuary station in NSW. The exemplary Federation Anglo-Dutch architectural style of the Railway Institute is significant and it was as the first institute of its type in Australia, demonstrating 19th century initiatives in railway workers educational and recreational facilities. The Parcels Post Office contains fine brickwork and sandstone detailed facades and documents the association of the site with railway postal services.

The significance of Central Station is widely appreciated by the broad community for its sense of place and theatre; as an extraordinary place of work for employees past and present and their families; and by many specialist transport and heritage community groups.

The Bradfield designed former Lost Property Office was constructed between 1922 and 1926 as part of the electrical upgrades to Central Station. Extending the full width of the concourse, the building was constructed with a reinforced concrete roof, brick sidewalls and sandstone outer wall.

Sydney Terminal and Central Railway Station Group	
Approved project impact	<ul style="list-style-type: none"> <li>▪ New underground metro platforms and concourse below the existing suburban rail service platforms 12, 13, 14 and 15, and associated vertical transport (lifts and escalators)</li> <li>▪ Reinstatement of platforms 12, 13 and 14 over the metro cavern</li> <li>▪ Adjustments to the North Concourse and associated shortening of platforms 9 to 11 at the northern end, and a corresponding lengthening at the southern end</li> <li>▪ New canopies over the reinstated platforms 12 to 14 and between the Central Electric Building and the northern end of platforms 12 to 14</li> <li>▪ A permanent access bridge for maintenance vehicles from Regent Street to Sydney Yard, located between the suburban and intercity rail lines (referred to as the Sydney Yard Access Bridge)</li> </ul>
Assessment of approved project impact	<p>Physical impacts to the station would occur as a result of the excavation of the platforms, impacts to underground pedestrian tunnels including Devonshire Street Tunnel, impacts associated with access and egress from Eddy Avenue, installation of the Sydney Yard Access bridge and use of a temporary worksite in the Sydney Yards.</p> <p><b>Direct impact: moderate to major</b></p> <p>The works are likely to result in moderate to major temporary and permanent visual impacts through the establishment of the staging area, excavation of the platforms, and construction of the Sydney Yard Access Bridge. On completion of the works, the introduction of new infrastructure may have a minor, or negligible, visual impact.</p> <p><b>Indirect impact: moderate to major</b></p>
Proposed modification heritage impact assessment	<p>Additional physical impacts to the station would occur as a result of trenching in platform 4/5, connection of the baggage tunnels to the service route, demolition of portions of the suburban platforms and canopies and removal of original elements (balustrades, stairs), connection to the unused underground platforms for the service route and alteration of eastern suburbs railway concourse, an underground services connection from the Lee Street substation (under construction) below the intercity tracks and to the southern end of the approved project station excavation, an underground services connection from the Chalmers Street substation to the services route and temporary removal of a portion of the eastern brick boundary wall for the excavation for the east concourse.</p> <p>Vibration during excavation of the east concourse and construction of the underground services routes may impact on baggage tunnels, suburban platforms and underground platforms.</p> <p>Views and vistas would be impacted by the modification of canopies and addition of lifts and escalators on the suburban platforms.</p> <p>The following is a detailed breakdown of additional impact to individual items within Central Station.</p> <p><b>Aboveground suburban platforms</b></p> <p><u>Additional impacts of the proposed modification</u></p> <ul style="list-style-type: none"> <li>▪ Excavation within platforms 16-23 for the construction of vertical transport to / from the east concourse</li> <li>▪ Localised impact to canopies for vertical transport from east concourse, including the removal and replacement of overhead wiring</li> <li>▪ Platform refresh / relevelling works</li> <li>▪ Removal of stairs and existing entrances on platforms 16-23, including balustrades and metal folding screens.</li> </ul>



#### Revised assessment of impact

The construction of the east concourse would have moderate impact on the canopies of the suburban platforms, as impact would be limited to the areas where new lift structures are required to extend through the canopy. Similarly, excavation impact to platforms would be largely limited to those areas where new vertical transport is required. The removal of a number of elements that visibly contribute to the heritage significance of the platforms, such as the stairs (excluding the northern and southernmost stairs) and associated metal grills and balustrades at stair openings would result in an adverse impact to heritage fabric and alter the configuration of the platforms. Conversely, the removal of a number of modern elements, and replacement of these elements during platform refresh works, would result in decluttered views and vistas within the platforms themselves.

The heritage impact of the approved project to the suburban platforms was previously assessed as being moderate. The proposed modification would result in additional direct impacts to the suburban platforms, assessed as an item of moderate significance in the 2013 CMP. Overall, the project as modified would result in a major direct impact to the suburban platforms through the additional removal of original fabric and alteration and removal of existing stairs.

#### **Subway passage systems**

##### Additional impacts of the proposed modification

- Removal of portions of existing baggage tunnels through closure of existing access points to the suburban platforms

##### Revised assessment of impact

The heritage impact of the approved project to the subway passage systems was previously assessed as being moderate to major.

The closure of existing access points to the north and south east-west baggage tunnels (stairs and platform connections) through the introduction of the east concourse would result in a minor impact through the removal of fabric. Historically, commuters did not use the baggage tunnels, and they have only been open to pedestrians for a relatively short period of time. The removal of this access would not impact on their historical use. Overall, the project as modified would continue to have a moderate to major impact on the subway passage systems.

#### **Country and interstate platforms**

##### Additional impacts of the proposed modification

- Trenching within platform 4/5, and gantry in the Sydney Yards for the service route

##### Revised assessment of impact

The installation of the proposed services route would require trenching within a portion of platform 4/5, and the introduction of a services gantry in the Sydney Yards to the south of the country and interstate platforms. This would result in the loss of a small amount of heritage fabric of moderate significance. Overall, this is a minor impact to the significance of the country and interstate platforms.

The heritage impact of the approved project to the country and interstate platforms was previously assessed as being major. The proposed modification would result in additional minor direct impacts to the country and interstate platforms. Overall the project as modified would continue to have a major impact on the country and interstate platforms.

### **Underground platforms and Eastern Suburbs Railway concourse**

#### Additional impacts of the proposed modification

- Removal of the ramp, widening of the stairs and introduction of a lift on the Eastern Suburbs Railway concourse
- Connections from the Eastern Suburbs Railway concourse to the eastern entry and the east concourse
- Connections between unused platforms and the temporary and permanent combined services routes
- Temporary use of the unused platforms for machinery and access to east concourse
- Permanent use of the unused platforms for storage of plant and services rooms.

#### Revised assessment of impact

The most substantial impact to the unused underground platforms and Eastern Suburbs railway concourse arising from the proposed works would be the creation of a new connection to the east concourse and eastern entry, the removal of the existing ramp, widening of the existing stairs and addition of a lift to the Eastern Suburbs Railway concourse. These items contribute little to the overall heritage significance of the precinct and, overall, the impacts to the Underground Platforms and Eastern Suburbs Railway concourse would be minor.

A portion of the unused Eastern Suburbs unused platforms tunnel wall would be impacted by the permanent ventilation infrastructure and the temporary services route, with another portion impacted by the combined services route beneath the east concourse. Plant and services rooms would be permanently stored / installed on the unused platforms. This would result in minor direct impacts to the platforms.

The approved project will not impact on the underground platforms and Eastern Suburbs Railway concourse. The proposed modification would result in additional impacts. Overall, the project as modified would have moderate direct impact on the underground platforms and Eastern Suburbs Railway concourse.

### **Devonshire Street tunnel and concourse**

#### Additional impacts of the proposed modification

- Impact to a retail space within the Devonshire concourse through introduction of a shaft for permanent ventilation infrastructure and the temporary services route
- Realignment of existing ticket gateline and removal of existing services room.

#### Revised assessment of impact

The services route (Chalmers Street) and permanent ventilation infrastructure will connect to the unused T4 Eastern Suburbs platforms 26/27 and part of the installation would impact on a small portion of the concourse within the Devonshire Street Tunnel. This would result in the removal of the existing retail / food outlet in this location and a portion of the floor, and the alteration of internal views and vistas through the permanent removal of the retail outlet and introduction of external vent infrastructure. This would result in a negligible heritage impact.

The heritage impact of the approved project to the Devonshire Street tunnel was previously assessed as being major. The proposed modification would result in additional negligible direct impact. Overall, the project as modified would continue to have a major impact on the Devonshire Street tunnel and concourse.



### **Devonshire Street entrance and environs**

#### Additional impacts of the proposed modification

- Introduction of permanent external ventilation infrastructure
- Removal and reinstatement of portion of brick boundary wall including murals
- Introduction of east entry construction site

#### Revised assessment of impact

The eastern entry construction site would be located outside the curtilage of Central Station, and would result in negligible and temporary visual impacts to the eastern Devonshire Street entrance and surrounding environs. Minor impacts to heritage fabric would occur through the temporary removal of a portion of the eastern brick boundary wall during mined excavation for the east concourse. This would be reconstructed on stabilisation of the ground. There are currently a series of air-brushed murals commemorating rail workers attached to the wall. These are assessed as an item of moderate significance in the CMP. As they are detachable the murals would be replaced on the reconstructed wall.

The approved project will not impact on the Devonshire Street entrance and environs. The proposed modification would result in additional direct impacts. Overall, the project as modified would have a minor impact on the Devonshire Street entrance and environs.

### **Sydney Yards**

#### Additional impacts of the proposed modification

- The proposed modification would utilise the worksite established in the Sydney Yards for the approved project
- Services route including gantries (temporary and permanent)
- Underbore (Lee Street).

#### Revised assessment of impact

A services route for an electrical connection from the Lee Street substation would be located approximately 11-12 metres below the intercity tracks, within the Sydney Yards. Vibration impacts to heritage significant structures are not expected.

A new services gantry (part temporary and part permanent) would pass through the Sydney Yards. As the gantry would take on the form of existing vertical structures within the Sydney Yards, the visual impacts of the introduction of the gantry would be minor. Physical impacts resulting from excavation of footings for the gantry, and the inground portion, would result in minor impacts to the Sydney Yards.

The heritage impact of the approved project to the Sydney Yard was previously assessed as being moderate. The proposed modification would result in additional minor impact. Overall, the project as modified would continue to have a moderate impact on the Sydney Yards.

### **Archaeological remains**

#### Additional impacts of the proposed modification

- Mined excavation for the east concourse. These works pass through the area identified as having potential to contain remains associated with the Devonshire Street Cemetery
- Excavation within platforms 16-23 for the construction of vertical transport (lifts and escalators) to the east concourse
- Excavation within Sydney Yards and platform 4/5 for the installation of the service gantry
- Excavation of a shaft adjacent to the entrance to the Devonshire Street Tunnel (likely to have been impacted by excavation of the tunnel and therefore have low archaeological potential) and services route (connections to the Chalmers Street and Lee Street substations).

Sydney Terminal and Central Railway Station Group	
	<p><u>Revised assessment of impact</u></p> <p>It is likely that the majority of burials within the former Devonshire Street Cemetery were exhumed prior to the construction of the Sydney Terminal in the early years of the Twentieth century. Investigation of comparative examples, however, suggests that exhumation processes were often incomplete, leaving partial, and sometimes whole burials, in situ. Therefore, while the potential for encountering remains (intact burials or disarticulated skeletons) is low, it cannot be entirely discounted. In addition, any excavation into historical fill introduced following the decommissioning of the cemetery has potential to encounter disarticulated remains. Excavation works for the east concourse have the potential to encounter archaeological remains associated with the Devonshire Street Cemetery. The impact to these remains would be minor.</p> <p>There is moderate potential that archaeological remains associated with earlier phases of Central Station would be located throughout the study area. Any remains are unlikely to be intact due to alterations and modifications that have taken place within the station precinct and yards throughout its use-life. There is low potential that evidence of earlier platform structures would be located within the fill used in the construction of the current platforms. Unexpected finds, however, cannot be discounted. Works with the potential to encounter the remains of the first and second Sydney Railway Station include, excavation within platforms 16-23, excavation within the Sydney Yard for the installation of a new temporary and permanent services gantry and excavation of a shaft adjacent to the entrance of the Devonshire Street Tunnel.</p> <p>It is possible that portions of early unmapped service lines may be identified during excavation works (note that the South Western Main Branch of the BOOS and Prince Alfred Sewer are outside the Central Walk study area). Works with the potential to encounter remains of this type include excavation within the Sydney Yard for the installation of a new services gantry and excavation of a shaft adjacent to the entrance of the Devonshire Street Tunnel.</p> <p>The heritage impact of the approved project on potential archaeological resources was assessed as being moderate to major. The proposed modification would result in additional moderate to major impact. Overall, the project as modified would continue to have a moderate to major impact on the potential archaeological resources within Central Station.</p>
<b>Additional impacts of the project as modified in relation to heritage significance criteria</b>	<p>Although the project would result in major impacts to certain elements of the Sydney Terminal and Central Railway Station Group, it would retain its State heritage significance as assessed against all relevant criteria.</p> <p>Historical significance of the group would be impacted through demolition of significant fabric such as platforms 12-15, portions of canopies on platforms 16-23, removal of stair access and associated balustrades on platforms 16-23, alterations to the Devonshire Street concourse and closure of some pedestrian subway tunnels. Overall, however, the station would retain historical significance as a working transport hub which has continued its primary use for over 150 years. The Sydney Metro works at Central Station as modified would be the next phase in this evolution.</p> <p>Aesthetic significance would be impacted by construction of the Sydney Yard Access Bridge, introduction of the services gantry and modification of canopies, introduction of lifts and escalators on the suburban platforms 16-23. The aesthetic significance of many of the major structures within the group such as the Main Terminus would not be impacted. Aesthetic impacts to the item overall during the operational phase of the project as modified would be negligible to minor.</p> <p>Technical significance of the item would be impacted through removal of some original fabric which relates to construction and development of the station, such as platforms, canopies, some pedestrian / baggage tunnels and the Devonshire Street Tunnel and concourse. Examples of</p>



Sydney Terminal and Central Railway Station Group	
	<p>technical achievement would remain in many structural elements of the station that would not be impacted.</p> <p>Research significance of the item would be impacted through the removal of any archaeological deposits, especially related to earlier phases of station development or the Devonshire Street Cemetery.</p>
Application of CMP policies	<p>The Central Station Conservation Management Plan (CMP) outlines heritage management policies for the item. Adherence to relevant policies has been discussed below.</p> <p><b>Policy 1 – Overall heritage management of Central Station.</b></p> <p><i>The government agency/ies responsible for the Central Station CMP area should continue to implement a heritage management structure for the CMP area:</i></p> <p>Heritage management has been accounted for during design development for proposed works at Central Station. Design guidelines have also been developed for the approved project and the proposed modification with input from a heritage specialist technical advisor. Detailed design would be informed by the design guidelines and heritage vision.</p> <p><b>Policy 2 – Ongoing use as a Major Transport Complex:</b></p> <p><i>The government agency/ies responsible for the Central Station CMP area should:</i></p> <p><i>Recognise that the continuing and sustainable use of Central Station as a major transport hub in NSW is an essential part of its outstanding heritage value.</i></p> <p><i>Recognise that the outstanding heritage values can be successfully balanced within the need for Central Station to continue as a major transport interchange in NSW including both major change and the management of ongoing minor technical adaptation, maintenance and repair; and</i></p> <p>The project as modified would be part of the continuing evolution of Central Station as a transport hub. The project as modified would introduce a contemporary layer of development, sympathetic to the heritage values of the station, to represent a new phase of use. There are also opportunities to recognise and highlight the heritage values of the station. Heritage interpretation incorporated into the design would draw the public's attention to the heritage values of the station and encourage engagement with its dynamic past.</p> <p><b>Policy 5 – Setting, Views &amp; Landscape</b></p> <p><i>Ensure that the urban setting of Central Station is treated in an appropriate manner which recognises its outstanding heritage values and its listing as a major part of a Special Area in the Sydney LEP 2012.</i></p> <p>Overall the majority of the project as modified would be constructed underground or outside the curtilage of the station and would not impact on setting and views from the majority of the surrounding areas. The character of the station as a major urban transport hub would be maintained.</p> <p><b>Policy 6 – Archaeological management</b></p> <p><i>Excavation in areas of identified archaeological potential will be subject to approval or exemption pursuant to Section 57 (1) of the NSW Heritage Act 1977.</i></p> <p><i>Ensure that archaeological advice is sought at the planning stages of any excavation work in the areas requiring archaeological monitoring and/or archaeological excavation and that the appropriate approval or exemption is obtained prior to work commencing.</i></p> <p>The identification of areas of archaeological potential outlined in this document would facilitate appropriate management of the archaeological resource.</p>

**Sydney Terminal and Central Railway Station Group**

**Policy 7 – Heritage Conservation and Major Works**

*Ensure the following are undertaken for major works within the CMP area:*

*Involvement of appropriate heritage professionals at an early stage including consideration of heritage opportunities and constraints surrounding the works prior to design work commencing;*

Heritage consultants and architects have been involved in design development of the approved project and the proposed modification. Detailed design is being undertaken in consultation with a heritage architect and would be informed by the design guidelines, which have taken into account the CMP.



## Elements and items within Sydney Terminal and Central Railway Station Group

### Aboveground suburban platforms

Aboveground suburban platforms	
<p><b>Image</b></p> 	<p>Original corbelled brickwork to platform support wall and original iron balustrade (L); Aerial view of reinforced concrete awnings (R).</p>
<p><b>History and description</b></p>	<p>Between 1922 and c1926 four new island platforms (platforms 16/17, 18/19, 20/21 and 22/23) were built to the east of the 1906 station platforms, at a higher ground level, to take the new electric trains at Central Electric. The platforms are accessed from the North Concourse, constructed below track level to the west. The platforms were constructed of concrete and concrete rendered brick. Reinforced concrete was used in the platform awnings. Which are supported by steel columns and exposed steel trusses. The original timber formwork for the awnings is discernible in the ceiling behind the trusses. The platforms retain the original metal decorative balustrades and tall metal sign brackets. The platforms are paved with brick pavers over the original asphalt surface, and the level of the platforms has been raised. The original corbelled brick supporting platform walls remain in situ.</p> <p>The platforms contain a number of recent additions including c.2000 metal clad huts at the northern ends of platforms 16/17 and 20/21 for the operating managers, a lift on platform 16/17, and retail tenancies on platform 22/23.</p>
<p><b>Significance</b></p>	<p>The following overview of significance for the aboveground suburban platforms has been reproduced from the 2013 CMP Inventory Sheet for Precinct 5: Central Electric:</p> <p><i>The platforms are significant as evidence of the transition in the 1920s from the traditional use of bricks or stone to concrete; and also for the innovative use of reinforced concrete in the platform awnings. Central Electric was the only station on the new electric system to use reinforced concrete slabs for the platform canopy roofs.</i></p>
<p><b>Approved project impact</b></p>	<p>Excavation works for the metro platforms would result in minor vibration impacts to the closest adjacent, but not directly affected, suburban platform (to the east of the excavation).</p> <p>Construction of new stairs between the Olympic Tunnel and platforms 20-23.</p> <p>Overall, the project as approved would result in minor impacts to the suburban platforms.</p>
<p><b>Additional impact of the proposed modification</b></p>	<p>Direct impact – demolition and construction (new stairs, escalators, canopies, metal screens, balustrades)</p> <p>Potential direct impact – vibration (excavation of concourse and demolition)</p> <p>Indirect impact – views and setting (decluttering, introduction of new lifts and escalators, removal of existing stairs and platform refresh)</p>

## Overview of elements and potential impacts of the proposed modification

Element	Grading	Condition	Impact of proposed modification	Assessment of impact
Aboveground platforms overall	Moderate	Good	<p>The proposed works that would impact on platforms 16-23 include the following:</p> <ul style="list-style-type: none"> <li>▪ The east concourse would be mined below platforms 16 to 23. A number of works would take place on the platforms to facilitate this, and provide new entrances to the east concourse on the existing platforms</li> <li>▪ The platforms would be subject to refresh works and platform raising / levelling</li> <li>▪ Canopies on platforms 16-23 would be impacted in specific locations where new openings would be created for the installation of lifts.</li> </ul> <p>The removal of existing stairs entrances and their associated balustrades and metal folding screens would result in moderate alteration of views at platform level, and alter commuter experience and use of the aboveground platforms. Their removal would also result in the loss of heritage fabric with moderate heritage significance.</p> <p>A temporary services gantry would be installed within the Sydney Yards, to the south of the aboveground platforms. This gantry would be typical of existing vertical elements within the Sydney Yards, and would constitute a negligible impact to views and vistas.</p> <p>This element would experience vibration above the screening criterion as a result of excavation for the concourse and demolition within platforms. This would result in a minor impact.</p>	Major
Platforms and paving	Moderate	Fair	<p>Sections of platforms and paving would be demolished to facilitate the mined east concourse. Surface works on the platforms would include the following:</p> <ul style="list-style-type: none"> <li>▪ Adjustments / replacement of overhead wiring</li> <li>▪ Temporary removal of overhead wiring</li> <li>▪ Demolition of sections of each platform</li> <li>▪ Excavation and piling for concourse roof slab support</li> <li>▪ Piling of escalator and lift openings</li> <li>▪ Demolition of existing stair openings.</li> </ul> <p>On completion of excavation and reinstatement, platform refresh works would include the following:</p> <ul style="list-style-type: none"> <li>▪ Relocation / removal of seating, bins, vending machines</li> <li>▪ Installation of signage and platform furniture</li> <li>▪ New tiles, painting and finishes.</li> </ul>	Moderate



Element	Grading	Condition	Impact of proposed modification	Assessment of impact
			<p>Areas of the platforms not affected by other construction work would be shaved or would have topping applied to achieve a consistent grade and finish. Platform releveling would involve the raising of the platforms to create a slope back to the centre of the platform. A strip drain, connected to existing platform drainage, would be installed in the centre of each platform. The existing brick platform edges would be reinforced as part of this work.</p> <p>A temporary services gantry to carry services from an access shaft would be located immediately south of the aboveground platforms in the Sydney Yards. This would result in a negligible visual impact.</p>	
Corbelled platform walls	Moderate	Good	The existing brick platform edges would be reinforced, but the walls would not be impacted.	Minor
Iron balustrades and sign brackets	Moderate	Good	A number of existing stairs would be permanently removed. The iron balustrades at the top of the stair openings would also be removed.	Major
Metal folding screens	Little	Good	A number of existing stairs would be permanently removed. The metal screens at the top of the stair openings would also be removed.	Major
Wall tiling and number tiles (stairwells)	Moderate	Good	Wall tiling and number tiles would be removed during demolition of existing stair openings.	Major
Stairs to subway tunnels and northern concourse	Moderate	Good	Some of the stair openings between the platforms and existing underground tunnels would be removed.	Major
Concrete platform roofs, columns and trusswork	High	Good	Impacts to canopies would be limited to those areas required for the new lift structures.	Moderate
Central signs/signage and wayfinding	High/little	Good	Some of these would be replaced as part of the platform refresh works.	Moderate
Weather Shelters (southern platform ends)	Moderate	Good	No impact	Neutral
Mid to late 20 <sup>th</sup> century platform sheds	Little	Good	No impact	Neutral
C2000 metal clad platform sheds	Little	Very good	No impact	Neutral

Element	Grading	Condition	Impact of proposed modification	Assessment of impact
C2000 lifts (northern platform ends)	Little	Very good	No impact	Neutral
Introduced services; mechanical, electrical, lighting and data	Intrusive	Good	These would be replaced where necessary.	Minor

### Overview of heritage impact – aboveground suburban platforms


The construction of the east concourse would have moderate impact on the canopies of the aboveground platforms, as impact would be limited to the areas where new lift structures are required to extend through the canopies. Similarly, excavation impact to platforms would be largely limited to those areas where new vertical transport is required. The removal of a number of elements that visibly contribute to the heritage significance of the platforms, such as the stairs, metal grills and balustrades at stair openings, would result in a major impact to heritage fabric and considerably alter the configuration of the platforms. Conversely, the removal of a number of modern elements, and replacement of these elements during platform refresh works would result in decluttered views and vistas within the platforms themselves. Overall, the proposed modification would result in major impact to the above ground platforms.

- Direct impact – major (demolition and removal of original elements)
- Potential direct impact – minor (Vibration)
- Indirect impact – moderate (views and setting at platform level).

The 2013 CMP assessed the aboveground platforms as being an item of moderate heritage significance within the Central Electric precinct. The impacts to the aboveground suburban platforms would not impact on the overall heritage significance of the Central Station precinct.



## Subway passage systems

Subway passage systems	
Image	<p>Views of the subway tunnels. Artefact 2016.</p> 
History and description	<p>Beneath platforms 1-23, the basement level of Central Station contains an intersecting series of pedestrian and service tunnels. The system provides access to the platforms above and to offices, maintenance depots, kitchens and loading docks.</p> <p>Prior to the construction of the current Sydney Terminus, the area now occupied by the Subway Passage Tunnels was occupied by institutional buildings and the Police Barracks from the 1820s throughout the 19th century.</p> <p>The Subway Systems allowed for the transport of luggage, mail and other items without interfering in the public space at platform level. When the Central Electric lines were constructed in 1926, the passage system was extended to service the new platforms. During the Second World War the volume of mail, and fumes from the tractors used to manage it, rendered the tunnels unsuitable.</p> <p>In 1979 the tunnel under the northern portion of the Main Terminus was extended to the Eastern Suburbs Railway Concourse and used as a pedestrian connection.</p> <p>In the late twentieth century much of the subway luggage system was converted into pedestrian subways to create links between the country platforms and Central Electric and in 1994 the southern tunnel was extended to connect to the Devonshire Street Tunnel. Part of the north tunnel was also covered for pedestrian use to link the northern end of Platform 10 to Platforms 16/17, 18/19 and the Eastern Suburbs Railway Concourse.</p>
Significance	<p>The following overview of significance for the subway passage systems has been reproduced from the 2013 CMP Inventory Sheet for Precinct 3: Sydney Terminal:</p> <p><i>The overall Central Station site, through its main terminus building, approach ramps, above ground level upper concourse and subway system in particular, is rare evidence of an innovative and grand urban plan which was without parallel in Sydney at the time of construction. With its multi layered access modes, brought about in large part by the subway system, the site contains technical innovation in design expressed in part by the subway system. The complexity of the design of the subway system is remarkable and rare and also evidence of the collaboration of the innovative skills of two different branches of the Department of Public Works. The passages are in this way associated with Henry Deane (Engineer-in-Chief, Public Works) and Walter Liberty Vernon (Government Architect, Public Works). The subway passage system, albeit modified, continues to define the site and exemplify the railway terminus design ideals of the early 20th Century. The subway system is part of the central core of the site listed in 1999 on the State Heritage Register under Sydney Terminal and Central Railway Stations Group.</i></p>

Subway passage systems	
<b>Approved project impact</b>	The construction of the platforms would cut three branches of the subway passage systems (currently used as pedestrian routes) which are elements of moderate/high significance. The impacts would result in loss of original fabric and a change to the historical alignment and pedestrian flow of the tunnels. This impact was assessed as being moderate to major.
<b>Additional impact of the proposed modification</b>	<p>Direct impact – connection to the service route</p> <p>Potential direct impact – vibration (trenching)</p> <p>Indirect impact – removing pedestrian access to the southern and northernmost (Olympic Tunnel) east-west baggage tunnels</p>

### Overview of elements and potential impacts of the proposed modification

Element	Grading	Condition	Impact of proposed modification	Assessment of impact
Subway passage system overall	Moderate/high	Good/fair	<p>The services route would connect into the baggage tunnel via a section of trenching through platform 4/5.</p> <p>Portions of the underground passages would also be closed to pedestrian access. As the passages were not originally open to commuters, this would be a negligible impact.</p> <p>This element would experience vibration above the screening criterion as a result of trenching for the services route.</p>	Minor
Luggage Tunnels (Platforms 16-23/1-15)	Moderate/high	Good/fair	The services route would also connect into the baggage tunnel via a section of trenching through platform 4/5. These connections would result in the loss of portions of the tunnel walls.	Minor
Platform connections to subways	Moderate	Good	Some entrances to tunnels on the suburban platforms would be closed off to the public.	Minor
Stair connection to platforms	Moderate	Good	Stairs directly impacted by the east concourse, or that provide access to baggage tunnel would be removed.	Moderate
North-south connection	High	Poor	No impact	Neutral
East-west connections	Moderate/high	Good/poor	Pedestrian access to the southern and northernmost (the Olympic Tunnel) east-west baggage tunnels would be removed below the suburban platforms. Tunnels under the intercity platforms would remain and connect to the approved metro concourse.	Neutral
Paving	Little	Fair	No impact	Neutral
Tiling	Moderate	Good	No impact	Neutral



Element	Grading	Condition	Impact of proposed modification	Assessment of impact
Ceilings	Moderate	Good	No impact	Neutral
Applied finished	Little	Good	No impact	Neutral
Introduced services; mechanical, electrical, lighting and data	Intrusive	Good	No impact	Neutral

### Overview of heritage impact – Subway passage systems


The services route would result in minor impacts to the heritage fabric of the east-west baggage tunnel.

The closure of existing access points to the north and south east-west baggage tunnels (stairs and platform connections) from the suburban platforms through the introduction of the east concourse would also result in a minor impact through the removal of fabric. Historically, commuters did not use the baggage tunnels, and they have only been open to pedestrians for a relatively short period of time. The removal of this access would not impact on their historical use.

- Direct impact – minor (connection to combined services route and removal of stair and platform connections)
- Potential direct impact – minor (vibration)
- Indirect impact – negligible (closure of underground passages).

The 2013 CMP assessed the subway passage system as being an item of moderate / high heritage significance within the Sydney Terminal (a precinct of exceptional significance). The impacts to the subway passage system would not impact on the overall heritage significance of the Central Station precinct

## Country and interstate platforms

Country and interstate platforms	
<p><b>Image</b></p>	<p>Typical original awnings on platforms 4-15 (L); Brick hut on platforms 4/5 with covered sky lights to Devonshire Street tunnel to the left (R).</p> 
<p><b>History and description</b></p>	<p>The country and interstate platforms consist of seven double platforms and one single platform servicing a total of fifteen tracks and numbered consecutively from west to east. Prior to the construction of the Sydney Terminus the area currently occupied by the country and interstate platforms north of the Devonshire Street Tunnel was occupied by the Devonshire Street Cemetery. The extension of Platforms 1, 2 and 3 overlaps with the site of the first and second Redfern Station passenger terminal.</p> <p>When the third Central Station Terminus opened in 1906 it consisted of 13 terminus platforms, two horse and carriage platforms and four short dock platforms west of Platform 1 for the loading of parcels, mail and luggage. In 1914 the horse and carriage platforms were converted to Platforms 14 and 15. Platform 1 was extended in 1937 and 1949 as the length of trains terminating at Sydney Terminus increased. The introduction of diesel hauled locomotives resulted in the extension of Platform 1 to its present length of 370 metres, and Platforms 2/3 to 324 metres.</p> <p>The southern end of the platforms originally had skylights and vents, to provide light and ventilation to the Devonshire Street Tunnel (constructed in 1906). The skylights on Platforms 1 and 2/3 were demolished in 1965, and those on Platforms 8/9 and 10/11 were removed prior to the Olympics in the 1990s.</p> <p>Platforms 1 to 15 originally had timber platform awnings clad with corrugated iron. The awnings on Platforms 4-15 are largely original. Platforms 1 and 2/3 were replaced in the 1990s. Platforms 12/13 and 14/15 (which would be impacted by the approved project) have had their awnings truncated through the introduction of escalators in the 1980s.</p> <p>During the 1990s Platforms 8/9 and 10/11 were truncated at the northern end, the original buffer stops were moved southwards and paving and balustrades updated.</p> <p>Many of the goods lifts originally operating between the platforms and the luggage tunnels below were decommissioned in the 2000s and replaced with stair connections coinciding with the opening of the passages for pedestrian use. Men's toilets, constructed in 1906, were originally located below the platform access before being relocated to the Grand Concourse in 2006.</p>



Country and interstate platforms	
<b>Significance</b>	<p>The following overview of significance for the country and interstate platforms has been reproduced from the 2013 CMP Inventory Sheet for Precinct 3: Sydney Terminal:</p> <p><i>Notwithstanding the various extensions and truncations of the Country and Interstate Platforms over the course of a Century, the overall layout of these platforms conforms to their c1906 design. Some of the original fabric of these platforms remains in situ and the platforms document the evolution of the railways since the establishment of the c 1906 third Sydney Station.</i></p> <p>The country and interstate platforms are assessed as having moderate significance within the wider context of the Sydney Terminal precinct, and the Central Railway Station heritage item.</p>
<b>Approved project impact</b>	<p>Changes to the country and interstate platforms would occur as a result of the approved project. Platforms 12 to 15 would be demolished, with platforms 12-14 reinstated. Platform 9-11 would also be lengthened to accommodate changes in the North Concourse to provide sufficient customer circulation. New canopies would be provided above these platforms and on the North Concourse. The form of these canopies is subject to further design development in accordance with Minister's conditions of approval for the project.</p>
<b>Additional impact of the proposed modification</b>	<p>Direct impact – trenching for temporary services route (platform 4/5)</p> <p>Potential direct impact – vibration (trenching and excavation within platforms)</p> <p>Indirect impact – views and vistas at platform level</p>

#### Overview of elements and potential impacts of the proposed modification

Element	Grading	Condition	Impact of proposed modification	Assessment of impact
Country and Interstate Platforms	Moderate	Good	The services route would require trenching within the southernmost extent of platform 4/5. A services gantry would also be located immediately south of the platforms, within the Sydney Yards. The gantry would be typical in form, and be an additional vertical element within the Sydney Yards. However, as the Sydney Yards contain numerous similar elements, the gantry would result in a negligible visual impact. The introduction of new lifts on the suburban platforms would have a minor impact on views and vistas at platform level. This element would experience vibration above the screening criterion as a result of trenching and excavation within platforms.	Minor
Platforms and Paving	Moderate	Good	A section of platforms and paving measuring approximately 300mm wide and 300mm deep would be removed from platform 4/5 during trenching connecting the services route to the underlying east-west baggage tunnel. This section of platform and paving would be reinstated following trenching work. This would result in minor impacts to heritage fabric.	Minor

Element	Grading	Condition	Impact of proposed modification	Assessment of impact
Platforms 1-3 awnings and columns	Little	Good	No impact	Neutral
Platforms 4-7 awnings, skylights, columns and trusswork	High	Good	No impact	Neutral
Platforms 8-15 awnings, skylights, columns and trusswork	Moderate	Fair/good	No impact	Neutral
Lattice screens separating platforms from grand concourse	High	Good	No impact	Neutral
Platform roof connections to platform access	Moderate	Good	No impact	Neutral
Platform goods lifts	Moderate	Fair	No impact	Neutral
Original platform lift mechanism	High	Good	No impact	Neutral
Skylights and brick huts (platforms 4-7)	High	Fair	No impact	Neutral
Brick store (Platforms 8-11)	Moderate	Fair	No impact	Neutral
Information boards, vending machines, signage and wayfinding	Little	Good	No impact	Neutral
Platform furniture	Little	Good	No impact	Neutral
Introduced services; mechanical, electrical, lighting and data	Intrusive	Good	No impact	Neutral
Platform 10/11 clock	Moderate	Fair	No impact	Neutral



Element	Grading	Condition	Impact of proposed modification	Assessment of impact
<b>Platform access area</b>				
Floors and paving	Little	Good	No impact	Neutral
Awning	Little	Good	No impact	Neutral
Cast iron columns	High	Good	No impact	Neutral
Contemporary barriers	Little	Very Good	No impact	Neutral
Decorative lattice metalwork	High	Good	No impact	Neutral
Former sandstone sub-station	High	Good	No impact	Neutral
Stairs to lower toilets	High	Good	No impact	Neutral

### Overview of heritage impact – country and interstate platforms

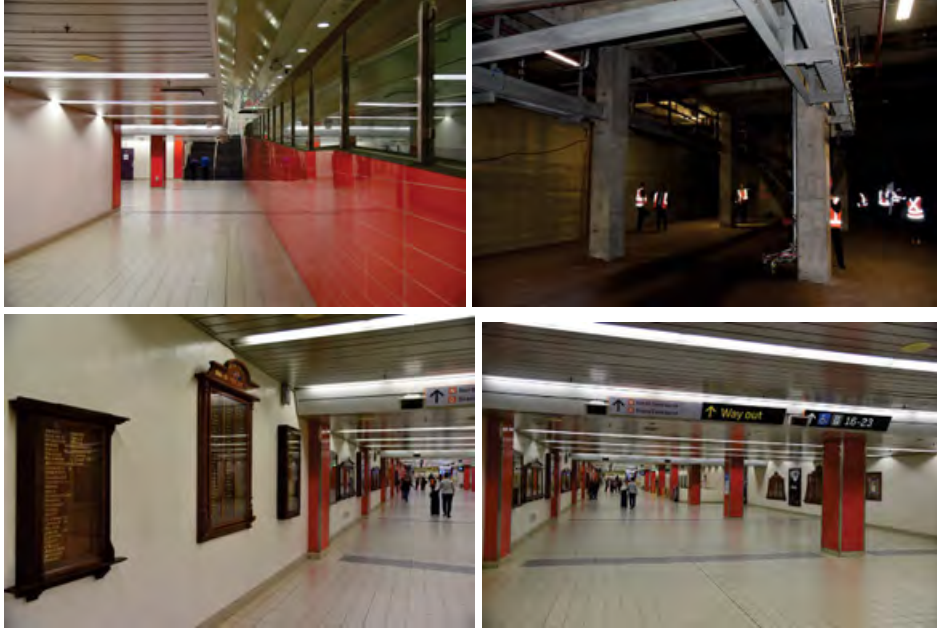
The installation of the proposed services route would require trenching within a portion of platform 4/5, and the introduction of a services gantry in the Sydney Yards to the south of the country and interstate platforms. This would result in the loss of a small amount of heritage fabric of moderate significance. Overall, this would be a minor impact to the overall significance of the country and interstate platforms heritage item.

The introduction of new lifts within the suburban platforms would have a minor impact on views and vistas at platform level.

- Direct impact – minor (trenching in platform 4 / 5)
- Indirect impact – minor (views and vistas)
- Potential direct impact – minor (vibration).

The 2013 CMP assessed the country and interstate platforms as being an item of moderate heritage significance within the Sydney Terminal (a precinct of exceptional significance). The proposed impacts to the country and interstate platforms would not impact on the overall heritage significance of the Central Station precinct

## Underground platforms and Eastern Suburbs Railway concourse

Underground platforms and Eastern Suburbs Railway concourse	
Image	<p>View of stairs and disability ramp to the Eastern Suburbs Concourse; the unused platforms 26 / 27; the war memorial honour boards. Artefact 2016.</p> 
History and description	<p>Work on the Eastern Suburb Railway (ESR) commenced in 1926 but was abandoned due to the onset of the Great Depression. Work recommenced in 1948, however, due to shortages in labour and materials, construction was slow and work was halted during the 1952 recession. Excavation work for platforms 24-27 resulted in several large holes in the ground at Central Electric, adjacent to Chalmers Street and opposite the Dental Hospital. These were eventually in-filled. In 1977 the northernmost east-west baggage tunnel was extended to the Eastern Suburb Railway Concourse, which eventually opened in 1979. As they were deemed redundant, no rail line was ever built to Platforms 26 / 27. A former baggage tunnel has been opened up for access through to suburban platforms 16-19. The main north-south pedestrian access corridor contains the railway war memorial honour boards.</p>
Significance	<p>The following overview of significance for the underground platforms and Eastern Suburb Railway concourse has been reproduced from the 2013 CMP Inventory Sheet for Precinct 5: Central Electric:</p> <p><i>Some significance may be derived from the association of the Underground Platforms and ESR with the political posturing which was associated with their long drawn out planning and construction. The ESR platforms contain original tiles of a colour scheme designed to distinguish these platforms from others on the same ESR line. When completed in the 1970s the ESR had a strong design aesthetic from the period, however, that has largely been obscured.</i></p> <p><i>The Honour Boards relating to the Sydney based railway employees who lost their lives in the First and Second World Wars and which have been on display in the main north-south access corridor (to platforms 24/25 for the Eastern Suburb Railway since the 1970s) are of high significance. .</i></p>
Approved project impact	<p>No impact</p>



Underground platforms and Eastern Suburbs Railway concourse	
<b>Additional impact of the proposed modification</b>	<p>Direct impact – excavation (access shaft); demolition (stairs and ramp); new lift</p> <p>Potential direct impact – vibration (excavation of access shaft)</p> <p>Indirect impact – views and vistas (widening of stairs, demolition of ramp and new lift)</p>

### Overview of elements and potential impacts of the proposed modification

Element	Grading	Condition	Impact of proposed modification	Assessment of impact
Underground platforms and Eastern Suburbs Railway concourse overall	Moderate	Fair	<p>To establish the eastern entry, a shaft would be excavated from street level to the unused platforms of the Eastern Suburbs Line. Roadheaders and other excavation equipment would then be lowered through the shaft to excavate the proposed east concourse (excavated using a mined methodology). Spoil would be moved back up the shaft to the surface.</p> <p>The services route would connect the unused Eastern Suburb Railway platforms to the concourse within the Devonshire Street station entry to facilitate the introduction of services and plant.</p> <p>New connection would be constructed through the concourse walls to the eastern entry and the east concourse.</p> <p>On completion of the east concourse, the existing Eastern Suburbs Railway concourse would undergo modification, including the widening of existing stairs, removal of a ramp and installation of a new lift.</p> <p>The demolition of an existing ramp and widening of a stair, and the introduction of new lift at concourse level, would result in negligible impacts to views and vistas.</p> <p>This element would experience vibration above the screening criterion as a result of excavation. This would result in a minor impact.</p>	Moderate
Platforms, paving and tiling	Moderate	Fair	<p>The unused platforms would be used as an access point for construction equipment during mining of the east concourse, and permanent storage of services and plant. These works would not impact on the fabric of the platforms.</p> <p>The wall of the tunnel would be impacted by the connection to the shaft through the Devonshire Street station entry and for the combined services route under the east concourse.</p>	Moderate
Stairs and escalators to ESR concourse	Little	Fair	The existing stairs would be widened.	Moderate

Element	Grading	Condition	Impact of proposed modification	Assessment of impact
Stairs and ramp to Devonshire concourse	Little	Very good	The works would require the widening of the stairs, and removal of the existing ramp, to accommodate the widened stairs and lift.	Moderate - major
Signage and wayfinding	Little / moderate	Good	These would be replaced where necessary	Moderate
Furniture	Little	Good	No impact	Neutral
Ceiling	Moderate	Fair	No impact	Neutral
Applied finishes	Little	Fair	No impact	Neutral
Introduced services; mechanical, electrical, lighting and data	Intrusive	Good	This would be replaced during the fit-out of mechanical and electrical services in the immediate vicinity of the proposed openings to the east concourse and the eastern entry.	Moderate
Honour boards	High	Good	The honour boards, which have been on display in this location since the 1970s, would be removed and stored during the works, and would be reinstated elsewhere within the station. The boards were originally located in the pedestrian subway to the Eastern Suburbs Railway.	Minor

### Overview of heritage impact – underground platforms and Eastern Suburbs Railway concourse

The most substantial impact to the underground platforms and Eastern Suburbs Railway concourse arising from the proposed works would be the creation of a new connection to the east concourse and eastern entry, the removal of the existing ramp, widening of the existing stairs and addition of a lift to the Eastern Suburbs Railway concourse. The unused platform tunnel wall would be impacted by the connection to the shaft in the Devonshire Street station entry and the connection of the combined services route. The unused platforms would also be used for the permanent storage of plant and service rooms. This would result in minor additional physical impacts to the platforms.


Although the proposed works would result in moderate to major impacts to numerous elements throughout the heritage item, the majority of these items contribute little to the overall heritage significance of the Central Electric precinct. Overall, the impacts to the underground platforms and Eastern Suburbs Railway concourse have been assessed as being moderate.

- Direct impact– moderate to major (excavation, demolition, new elements)
- Potential direct impact – minor (vibration)
- Indirect impact – negligible (views and vistas).

The 2013 CMP assessed the underground platforms and Eastern Suburbs Railway concourse as being an item of moderate heritage significance within the Central Electric precinct. These impacts would not impact on the overall heritage significance of the Central Station precinct.



## Devonshire Street Tunnel

Devonshire Street Tunnel	
Image	<p>Views of the Devonshire Street Tunnel</p> 
History and description	<p>The Devonshire Street Tunnel was the first subway in Australia and an integral part of Henry Deane's grand urban plan for the development of the Central Station site. During the main phase of construction c.1903-06, a section of the original alignment of Devonshire Street was excavated between the resumed Devonshire Street Cemetery and the northern frontage of the previous (second) Sydney Station, following the alignment of Devonshire Street. Large skylights were constructed at the end of the c.1906 platforms, and were designed to flood the tunnels with natural light. Two of these remain closed off at the ends of platforms 4/5 and 6/7.</p> <p>Since its inception, the tunnel interior has been constantly modified and there are no original surface finishes.</p>
Significance	<p>The following overview of significance for the Devonshire Street Tunnel has been reproduced from the 2013 CMP Inventory Sheet for Precinct 3: Sydney Terminal:</p> <p><i>The overall c.1906 Central Station site, with its multi layered access modes, is rare evidence of an innovative and grand urban plan which was without parallel in Sydney at the time of construction. The Tunnel is an integral part of the design, technically innovative in its day and probably the first urban subway in Australia. The Tunnel, albeit modified, continues to define the site, and exemplify the design ideals of the early 20th Century. It is part of the central core of the site listed in 1999 on the State Heritage Register under Sydney Terminal and Central Railway Stations Group. The four remaining skylights demonstrate the concern for fresh air and light of the original Sydney Terminal scheme.</i></p>
Approved project impact	<p>A 45 metre section of the Devonshire Street Tunnel would be removed and rebuilt where it interfaces with the approved metro platform excavation. The impacts would result in loss of original fabric and a temporary change in historical alignment and pedestrian flow. The direct impact was assessed as being moderate to major.</p>
Additional impact of the proposed modification	<p>Direct impact – shaft connection for permanent ventilation infrastructure and part of the temporary service route. The gateline on the concourse would be modified and an existing services room would be removed.</p> <p>Potential direct impact – vibration (shaft excavation)</p>

### Overview of elements and potential impacts of the proposed modification

Element	Grading	Condition	Impact of proposed modification	Assessment of impact
Devonshire Street Tunnel overall	High	Good	<p>A shaft would be excavated for permanent ventilation and temporary services in the position of an existing retail / food outlet. This would require the removal of the outlet, penetrations through the floor of the concourse in this location.</p> <p>Alterations to the existing Devonshire Street concourse ticket gateline and removal of an existing services room.</p> <p>This element would experience vibration above the screening criterion as a result of ventilation shaft excavation.</p>	Minor
Views and vistas	Little	N/A	No impact	Neutral
Alignment, context and setting	High	N/A	No impact	Neutral
Evidence of former skylights	High	Unknown	No impact	Neutral
Connection to Devonshire Street concourse	Moderate	Very good	<p>A shaft would connect into the Devonshire Street concourse in the position of an existing retail / food outlet. The outlet would be removed, and replaced with a wall.</p> <p>The existing gateline would be modified and a service room removed.</p> <p>This would result in minor visual impacts within the concourse.</p>	Minor
Eastern Entry	Moderate	Very good	No impact	Neutral
Western Entry	Moderate	Good	No impact	Neutral
Tiles murals and interpretation panels	Little	Good	No impact	Neutral
Floors and paving	Little	Good	A section of the floor below an existing retail outlet within the concourse would be impacted by introduction of the shaft.	Negligible
Ceiling	Little	Good	No impact	Neutral
Applied finishes	Little	Good	No impact	Neutral
Introduced services; mechanical, electrical, lighting and data	Intrusive	Good	No impact	Neutral



### **Overview of heritage impact – Devonshire Street Tunnel**

The 2013 CMP assessed the Devonshire Street Tunnel as being an item of high heritage significance within the Sydney Terminal (a precinct of exceptional significance).


The installation of a permanent ventilation shaft would impact on a small portion of the concourse within the Devonshire Street Tunnel. This would result in the removal of the existing retail / food outlet in this location and a portion of the floor, and the alteration of internal views and vistas through the permanent removal of the retail outlet.

- Direct impact – minor (removal of a portion of floor)
- Potential direct impact – minor (vibration).

Overall, the elements to be removed contribute little to the significance of the Sydney Terminal precinct, or to the overall heritage significance of Central Station.

## Chalmers / Devonshire Street entrance and environs

The 'Chalmers Street entrance and environs' item, as included in the 2013 CMP, incorporates the Chalmers Street entrance (at the intersection of Elizabeth and Chalmers streets), the eastern boundary of Central Station and the Devonshire Street entrance and forecourt. As the proposed modification would impact on the Devonshire Street entrance and environs only, for consistency of terminology, the item will instead be referred to as the 'Devonshire Street entrance and environs' throughout this assessment.

Devonshire Street entrance and environs	
Image	<p>View of the eastern boundary wall, looking north, with mural and busts to the left of images. Artefact 2016.</p> 
History and description	<p>The eastern boundary of Central Station is demarcated by a brick retaining wall. The entrance and retaining wall are contemporary with the construction of the city rail networks constructed in the 1920s.</p> <p>The wall murals lining the eastern boundary wall represent workers and events in the history of Central Station and were installed as part of the 150th anniversary of NSW Railways in c2005. The Ibero-American Plaza was founded in 1898 to commemorate the contribution of Spanish and Portuguese speaking people to Australia. In c2011 busts were installed in the Plaza to commemorate the significance of those depicted to the Iberian community.</p> <p>Adjacent to the Ibero-American Plaza space is a new glazed pedestrian entrance that links Chalmers Street to the Devonshire Street Concourse and Devonshire Street Tunnel.</p>
Significance	<p>The following overview of significance for the Devonshire Street entrance and environs has been reproduced from the 2013 CMP Inventory Sheet for Precinct 5: Central Electric:</p> <p><i>The Chalmers Street Entrance is an integral part of and documents the first phase of the suburban electrification of the NSW Railway in 1926. It is associated with Dr John Job Crew Bradfield. The Entrance demonstrated aesthetic significance in its Neo-classical architectural features and it is the grandest of entrances on the City Circle Line. The adjacent garden provides open space and enhances the setting of the Entrance. The use of sandstone for the Entrance exemplifies the distinctive and predominant use of sandstone for important public sites in the early 20th century.</i></p>
Approved project impact	No impact
Additional impact of the proposed modification	<p>Direct impact – demolition and reinstatement (brick boundary wall)</p> <p>Indirect impact – views and vistas (eastern entrance and construction site and external ventilation outlet)</p>

### Overview of elements and potential impacts of the proposed modification

Element	Grading	Condition	Impact of proposed modification	Assessment of impact
Devonshire Street entrance and environs overall	High	Good	<p>The majority of work in the vicinity of this item would take place underground and in the vicinity of the proposed eastern entry. Impacts to the Devonshire Street item would therefore be visual (removal of existing building / the construction works / new eastern entry).</p> <p>A portion of the existing brick boundary wall would be removed during excavation and reinstated on completion of the works.</p> <p>The services gantry would be located in the Sydney Yards, immediately west of the Devonshire Street entrance.</p> <p>Permanent ventilation infrastructure (in the form of glass louvres) would be installed near the Devonshire Street station entrance.</p>	Minor
Views and vistas	High	N/A	<p>The proposed eastern entry would be located approximately 100 metres north-east of the Devonshire Street entrance, and opposite the Ibero-American Plaza (included in the item). During demolition and construction, the site of the proposed eastern entry would be visible from the northernmost portion of the item, the Ibero-American Plaza.</p>	Minor
Context and setting	Moderate	N/A	<p>The proposed eastern entry would be located on the eastern side of Chalmers Street, to the north of the Devonshire Street entrance and environs item. This would alter the existing streetscape, and result in minor impacts to its setting. The context of the item, including its railway use, would not be affected.</p> <p>A services gantry to carry services from an access shaft (to be located adjacent to the entrance on its southern side), would be located immediately behind the entrance, in the Sydney Yards. As it would not be visible from Chalmers Street, the temporary services gantry would not impact on the context or setting of the Devonshire Street entrance.</p>	Negligible
Chalmers Street classical sandstone entrance	High	Good	No impact	Neutral



Element	Grading	Condition	Impact of proposed modification	Assessment of impact
Chalmers Street entrance garden and landscape elements	High	Good	No impact	Neutral
Brick wall murals	Moderate	Fair	A portion of the brick wall would be removed during construction. This is required as mining of the connection to the Eastern Suburbs Concourse, and subsequent land settlement, may make the wall unstable. The wall would be reinstated after the ground has settled. An area would be hoarded off while the section of the wall is absent for safety reasons.	Minor
Paving, kerbstones and drainage	Moderate	Fair	No impact	Neutral
Pedestrian shelter	Intrusive	Good	No impact	Neutral
Ibero-American Plaza and landscape elements	Moderate	Very good	No impact	Neutral
Devonshire Street tunnel entry	Little	Very good	<p>The proposed eastern entry would be located on the eastern side of Chalmers Street, to the north of the Devonshire Street entrance . This would alter the existing streetscape, and result in minor impacts to its setting. The context of the item, including its railway use, would not be affected.</p> <p>A temporary services gantry to carry services from an access shaft (to be located adjacent to the entrance on its southern side), would be located immediately behind the entrance, in the Sydney Yards. As it would not be visible from Chalmers Street, the temporary services gantry would not impact on the context or setting of the Devonshire Street entrance.</p> <p>The existing Devonshire Street station entrance consists of a contemporary glass structure. Permanent ventilation infrastructure (in the form of glass louvres) would be installed near the Devonshire Street station entrance. This would result in little visual alteration of the access.</p>	Minor


### **Overview of heritage impact – Devonshire Street entrance and environs**

The eastern entry construction site would result in minor and temporary visual impacts to the Devonshire Street entrance and environs. Minor impacts to heritage fabric would occur through the temporary removal of a portion of the brick boundary wall during mined excavation. This would be reconstructed on stabilisation of the ground.

- Direct impact – minor (demolition and reinstatement)
- Indirect impact – negligible (views and vistas).

The 2013 CMP assessed the Chalmers / Devonshire Street entrance and environs as being an item of high heritage significance within the Central Electric precinct. The impacts would not impact on the overall heritage significance of the Central Station precinct.

## Sydney Yards

Sydney Yards	
Image	<p>View of the Sydney Yards</p> 
History and description	<p>The Sydney Yards are effectively one large railyard which comprises the central portion of the overall site, south of the Devonshire Street subway. The precinct extends south of the Cleveland Street Bridge and lies between the Western Yard and the Central Electric precinct. The Sydney Yards in their original configuration date back to c.1855 and made up the yards of the first two Sydney Termini, south of Devonshire Street.</p> <p>There are a number of structures within this precinct, including a two-storey brick building, with a roof comprising a series of gables aligned east-west, known as the Cleaner Amenities building. This building contains some interesting early 20<sup>th</sup> century specialised vacuum equipment used for the cleaning of carriages and carpet runners. Adjacent to this building is the former Rolling Stock Officer Building, another two-storey brick building with a tiled hipped roof. Both these buildings are located within a small garden with a number of mature trees and garden beds. Immediately south of these buildings is a large open area adjacent to the earl 20<sup>th</sup> century flyovers, and containing the only extant Shunters Hut on the site. The Prince Alfred Sewer, built in 1857, is reputed to cross the yard just south of the Cleaners Amenities building and then runs into the cutting made for the Darling Harbour branch line, in the Western Yard. Another structure within this precinct is a 1960's yard controlled building accessed via a concrete path from end of Platforms 8 and 9.</p>
Significance	<p>The following overview of significance for the Sydney Yards has been reproduced from the 2013 CMP Inventory Sheet for Precinct 4: Sydney Yards</p> <p><i>The Sydney Yards have historical associations with the development of the Sydney rail network and the first, second and third Sydney terminuses. It has been continuously used as a railway yard since the 1850s.</i></p> <p><i>Archaeological resources associated with the first and second Redfern Stations are likely to be disturbed but may contribute some information not available from other sources about the configuration and use of these early railway uses. This information is likely to be fairly limited however, as there are numerous historic plans, photographs and written records that describe the various changes made to the site and its operation over time. Archaeological remans of the early railway uses will have higher historic than research values.</i></p>



<b>Approved project impact</b>	<p>Establishment of the approved Sydney Yard construction site and the approved Sydney Metro services building south of platforms 13 and 14 will require the removal of the following heritage items:</p> <ul style="list-style-type: none"> <li>▪ Garden associated with the former Rolling Stock Officers Building</li> <li>▪ Former Rolling Stock Officers Building</li> <li>▪ Cleaner's amenities</li> <li>▪ Shunters hut</li> <li>▪ Brick store</li> <li>▪ Yard controller building</li> </ul>
<b>Additional impact of the proposed modification</b>	<p>Direct – excavation (excavation within the yard for gantries and the trenched section of the services route)</p> <p>Indirect – views and vistas (introduction of the services route)</p>


### Overview of heritage impact – Sydney Yards

The approved project would remove built heritage items of significance within the Sydney Yards. It would also impact on potential archaeological resources. Additional impacts to the Sydney Yards from the proposed modification would include excavations for the services route, and indirect impacts to views and vistas through the introduction of the services route.

- Direct impact – negligible (excavation)
- Indirect impact – negligible (views and vistas).

The 2013 CMP assessed the Sydney Yards as having significance for its potential to contain archaeological remains, and for its historical association within the development of the Sydney rail network and Central Station. The impacts associated within the project as modified would result in negligible additional impacts to the Sydney Yards, and would not impact on the overall heritage significance of the Central Station precinct.

## Former 'Metro Goldwyn Mayer' building

Former "Metro Goldwyn Mayer" including interior	
Image	<p>View of the Former MGM building prior to conversion to the Bounce Hostel. Source: SHI.</p> 
Significance	Local (criteria A, B, C, F, G)
Description	<p>The former "Metro Goldwyn Mayer" Building (also known as the former MGM building), is a four storey building with a rendered cement façade.</p> <p>The section of Chalmers Street on which No. 20-28 is located formed an extension to Castlereagh Street, which was given its present name in 1905. At the end of the first decade of the twentieth century there seems to have been very little development on the block between Elizabeth and Devonshire streets, although the Dental Hospital was built around 1910 at 14 Chalmers Street and by 1915 there were a number of buildings situated within the block. After resumption for Central Railway Station the title to the site was vested in the Minister for Public Works, but it was subsequently conveyed to a succession of private individuals before being acquired by Metro Goldwyn Mayer Ltd at the beginning of 1932. The building was designed by the prominent architectural firm of Robertson &amp; Marks, was constructed by Stuart Bros., and was only one of several Sydney buildings specifically designed for American film studios during the inter war period.</p> <p>In the 1970s the building was acquired by the University of Sydney's Faculty of Dentistry in response to an increase in the number of undergraduate students. By 1980 the building was under the jurisdiction of the Health Commission of New South Wales and was incorporated into one large title that included it and the Dental Hospital.</p> <p>The entrance to the building is marked by three prominent arched openings, emphasised by decorative quoins, architraves and scrollwork. A remnant of the original tiled roofing, projecting above a heavily bracketed eave, separates the second and third floor levels of the façade. Some original timber framed multi-paned double hung window sashes still remain in place.</p> <p>Some original fabric exists within the building, including decorative terrazzo floor finishes in the ground floor vestibule, hardware on the main entry doors and the stair that is accessed from the vestibule, which includes terrazzo risers and treads and a wrought metal balustrade.</p>
Statement of significance	<p>The following statement of significance has been extracted from the State Heritage Inventory listing for the Former "Metro Goldwyn Mayer" building including interior:</p> <p><i>20-28 Chalmers Street provides evidence of the consolidation and dominance of American film interests in Australia during the 1930 and is one of three purpose designed head office and film</i></p>

Former “Metro Goldwyn Mayer” including interior	
	<p><i>exchange buildings constructed by major American film studios between 1933 and 1941 in the Surry Hills area. However, this level of significance has been diminished by modifications that have been undertaken to its interiors. Nevertheless the original sections of the building façade demonstrate a relatively high standard of architectural quality and resolution, and make a positive contribution to the streetscape.</i></p> <p><i>The building has associations with the prominent and influential architectural firm of Robertson &amp; Marks.</i></p>
Approved project impact	No impact
Additional impact of the proposed modification	Direct impact – complete demolition and cut-and-cover excavation within Randle Lane and Chalmers Street frontages
Revised heritage impact assessment	<p>The Bounce Hostel would be demolished for the proposed modification. Following the demolition of the building, the site would be used as a construction site to support the construction of the eastern entry and east concourse (via the unused platforms of the Eastern Suburbs Railway). On completion of construction works, the site would become the eastern entry.</p> <p>In 2006 the building was converted into the Bounce Hostel. This conversion altered the interiors considerably. The interiors have been altered previously during the period of ownership by the neighbouring Dental Hospital. The SHI listing states that these alterations have “obscured evidence of original use”. It is unclear if those significant internal decorative elements referred to in the SHI listing for the item have been retained. The heritage significance of the building, therefore, is retained in the façade. The SHI listing for the building notes that its level of significance under criteria A “has been reduced by modifications that have been undertaken to interior” and “that only the ground, first and second storey sections of the façade have retained substantial amounts of intact early fabric.” The original sections of the building façade are representative of commercial architecture from the first half of the 1930s (criteria G). Further, the façade demonstrates a relatively high standard of architectural quality and resolution, and makes a positive contribution to the streetscape (criteria C).</p> <p>Demolition of the building would result in the complete removal of this heritage significance.</p> <p>There is high potential that archaeological remains associated with residences associated with the former Railway Place would be located within the footprint of the Bounce Hostel and within Randle Lane. There is also potential that archaeological remains of residences remain within the Chalmers Street frontage / footpath, although these remains are unlikely to be intact (due to the installation of services and excavation for the Eastern Suburbs Railway underground platforms). It is assumed that the current building does not have a basement. While archaeological remains may have been impacted by construction of the Bounce Hostel building and installation and upgrading of service lines, overall, they are likely to be intact. It is also possible that partial and truncated remains may be preserved in the Chalmers Street frontage / footpath.</p> <p>Demolition and excavation for the eastern entry would have a major impact on this archaeological resource, resulting in its complete removal.</p> <p><b>Direct impact – major (demolition and excavation)</b></p>



## Dental Hospital including interior

Dental Hospital including interior	
Image	<p>View of the Dental Hospital. Source: SHI.</p> 
Significance	State (criteria A, B, C, D, F and G)
Description	<p>The Dental Hospital is a nine storey “wedge” shaped functionalist building located at the intersection of Chalmers, Elizabeth and Foveaux Streets. The original Dental Hospital on this site was built in 1910, but by the 1930s it could no longer meet demands. The new Dental Hospital was designed by Stephenson, Meldrum and Turner in 1937 and built by H. G. Whittle, incorporating the earlier buildings.</p>
Statement of significance	<p>The following statement of significance has been extracted from the State Heritage Inventory listing for the Dental Hospital including interior:</p> <p><i>The Dental Hospital is a long standing specialised health care building strategically located at Central Railway. Its continuity of use for nearly sixty years and the changes made to that building demonstrate the evolving needs of the service. It is one of the finest interpretations of functionalist philosophy applied to architecture in Sydney. Uncompromising clean geometric lines and the skilful exploitation of the narrow corner to locate a glass clad stair tower makes the Dental Hospital a landmark element in the Central Railway area. The dramatic wedge-shaped plan responds to the site geometry with the curved northern stairwell addressing the intersection of major city streets, and terminating an important city vista along Elizabeth Street. Its continuity of service to the people of Sydney and NSW on this site from 1910 and in this building from 1937, is of rare social significance.</i></p>
Approved project impact	No impact

Dental Hospital including interior	
<b>Additional impact of the proposed modification</b>	<p>Indirect – setting (removal of the Bounce Hostel (the former MGM Building) and introduction of the proposed eastern entry)</p> <p>Potential direct – vibration (demolition of Bounce Hostel (the former MGM Building) and adjacent excavation activities within Chalmers Street and Randle Lane frontages)</p>
<b>Revised heritage impact assessment</b>	<p>On completion of construction the proposed eastern entry would be located on the site of the Bounce Hostel (the former MGM Building), located south-west of the Dental Hospital. The demolition of the former MGM building while not resulting in direct physical impact to the Dental Hospital, would result in the removal of the historical connection between the two buildings. Although the buildings are no adjacent to each other, the historical connection derives from their relationship as prominent early twentieth century structures. This relationship, however, is not legible from street-level. It is possible that evidence of physical connection between the buildings, dating to the period of ownership of the former MGM building by the University of Sydney's Faculty of Dentistry (1970s) and the Dental Hospital phase of use (1980s), may survive internally.</p> <p>Overall, the historical connection to the former MGM building contributes little to the overall significance of the Dental Hospital, and demolition of the former MGM building would not impact on its significance.</p> <p>The Dental Hospital has aesthetic significance as an excellent example of the Inter-War Functionalist style. The heritage item occupies a prominent location and is a landmark building possessing a unique townscape presence (criteria F). As the building visually dominates views to the south, towards the Devonshire Tunnel entrance to Central Station, the removal of the MGM building from the streetscape would not impact on its significance.</p> <p>The proposed eastern entry would not visually compete with the Dental Hospital in terms of size, form or materials.</p> <p>The closest façade of this item is expected to experience vibration levels above the screening level for cosmetic damage. Shaft excavation and demolition adjacent to the heritage item may result in minor vibration impacts to the heritage item.</p> <p><b>Indirect impact – minor (setting)</b></p> <p><b>Potential direct impact – minor (vibration)</b></p>


## Former 'Railway Institute' building including fence and interior

Former 'Railway Institute' building including fence and interior	
<b>Image</b>	<p>View of the Railway Institute Building from the Sydney Yards</p> 
<b>Significance</b>	State (criteria A, C, D and E)
<b>Description</b>	<p>Constructed between 1891 and 1898 as a social and educational facility for railway employees, the Railway Institute Building remains generally as it was during the 1920s. The stages of expansion which were undertaken in the first thirty years of its operation are evident on its exterior and are defined by architectural style and materials employed for each stage. The Railway Institute Building of 1891 incorporates many distinguishing characteristics of the Federation Anglo-Dutch style, such as red brickwork, flemish gables, shallow pilasters, moulded bricks and picturesque massing. The 1898 section was constructed more simply, although brick type and detailing closely matched the earlier structure.</p> <p>Early twentieth century works associated with the main hall on the first floor of the 1891 building are still apparent. The stair at the western end of the building is visible through the arched window of the former porch, and the first-floor addition over is distinguished by brickwork of a different tone and a flat roof. The access passage and ancillary spaces behind the stage are clad in asbestos cement shingles and have been painted a dark colour to minimise their visual impact on the building.</p> <p>Early photographs show that the Railway Institute Building was enhanced by planting. At the time that the 1899 building was completed, tall shrubs grew behind the palisade fence along Devonshire Street and trees in Prince Alfred park formed a backdrop to the new addition. Planting was still in evidence, in a somewhat altered form, in 1919 when trees grew close to the 1899 addition. Currently, the building is set off by the palisade fence and areas of grass on the Chalmers Street side.</p>



Former 'Railway Institute' building including fence and interior	
<b>Statement of significance</b>	<p>The following statement of significance has been extracted from the State Heritage Inventory listing for the Railway Institute Building:</p> <p><i>The Railway Institute is culturally significant for the following reasons:</i></p> <p><i>It is historically significant as the first Railway Institute building to be erected in Australia, and an important educational facility at the end of the nineteenth and during the twentieth century.</i></p> <p><i>The 1891 section of the building is a rare and fine example of the Federation Anglo Dutch style, demonstrating a high degree of architectural quality and detail, particularly on its exterior. Later additions complement this original portion in scale and quality of materials.</i></p> <p><i>The building is an important and rare known example of the work of architect Henry Robinson.</i></p> <p><i>The building has rare technical significance because it is an outstanding and relatively intact example of a Railway Institute Building and demonstrates the activities which were carried out in association with adult education in the late nineteenth and early twentieth centuries.</i></p> <p><i>The building has representative social significance arising out of its seminal role as a railway institute and is still valued by a section of the community.</i></p>
<b>Approved project impact</b>	No impact
<b>Additional impact of the proposed modification</b>	<p>Indirect impact – setting (ventilation outlet and temporary services route)</p> <p>Potential direct impact – vibration (underbore below building to Chalmers Street Substation)</p>
<b>Revised heritage impact assessment</b>	<p>The former Railway Institute Building is a landmark building within the streetscape of Chalmers Street. Significant view corridors include the views towards the building from the west, over the railway line, where the colour and distinctive architecture of the building stands out across the Sydney Yards. Views from the north and south along Chalmers Street are partially screened by several large trees within the road corridor, and Prince Alfred Park and by the Devonshire Street tunnel entrance.</p> <p>The proposed location of the shaft in the Devonshire Street entry is to the north of the rear of the building, towards the railway line. The area is currently used by railway staff for access to the Prince Alfred Sidings. The services would pass through the shaft, and be attached to a temporary services gantry spanning the southern end of suburban and intercity platforms (with the section spanning the southern end of the suburban platforms removed at completion of construction). Although the gantry would constitute another structure within the railway corridor, it would not be dissimilar in form and material to existing overhead wiring structures in this location. Therefore, the temporary gantry would not significantly affect important view corridors towards the Railway Institute Building across the Sydney Yards.</p> <p>The introduction of louvres as part of proposed permanent ventilation infrastructure would require minor modification of the current Devonshire Street entrance. These additions would be located on the roof, in areas currently constructed of glass, and would not significantly alter the entrance building. This would not result in visual impacts to the Railway Institute Building.</p> <p>The underbore to the Chalmers Street Substation would be below the Railway Institute Building. This may result in minor vibration impacts to the item.</p> <p><b>Indirect impact – negligible (views and vistas)</b></p> <p><b>Potential direct impact – minor (vibration)</b></p>

## Former R. C. Henderson Ltd Factory

Former R. C. Henderson Ltd Factory	
Image	<p>Randle Street elevation (L); Randle Lane elevation (R).</p> 
Significance	Local
Description	<p>Designed in the Federation warehouse style, and constructed in 1912, the factory comprises a building of six storeys, plus basement, constructed of face brick walls with a pitched roof concealed behind a parapet wall along all four elevations. Apart from the replacement of some window frames and other minor modifications to openings, the building has survived largely intact externally. The adaptation of the building to non-industrial uses has retained its overall architectural integrity.</p> <p>Historic records indicate the interiors contained a timber staircase along the south side wall adjoining No. 15, a single room for each of the floors and a boiler room on the roof. The 1993 warehouse and woolstores survey (Howells and O'Donnell 1993) noted further details of the interiors including surviving ironbark columns and beams with iron saddles, timber panelled ceilings and timber floors. Some timber floorboards had been replaced. This survey also noted that the southern timber staircase survived intact with pressed and crimped metal sheeting lining the underside. Internal brick walls were painted. The basement floors were concrete slab with columns on brick piers set into concrete. A lift shaft has been added with two main elevators, one to Randle Street and the other to the basement level on Randle Lane.</p> <p>The original loading bay doors and basement carpark entrance on Randle Lane have been removed or altered.</p>
Statement of significance	<p>The following statement of significance has been extracted from the State Heritage Inventory listing for the Former R. C. Henderson Ltd Factory:</p> <p><i>Built in 1912 for ladies hat manufacturers, R. C. Henderson, this former factory represents the influx of industrial development in Surry Hills during the early decades of the twentieth century, associated with major changes in the suburb including the construction of Central railway station. As R C Henderson's main factory, the building is historically significant for its connection to the Australian production of felt and straw hats, which were sold throughout Australia and exported overseas. Through its original use for millinery from the 1910s-1950s, the building also provides evidence of the formerly widespread textiles and clothing industry in Surry Hills.</i></p>

Former R. C. Henderson Ltd Factory	
	<p><i>The scale of the factory demonstrates the success of this firm and Sydney's millinery industry during the early twentieth century from an era when hats were an important part of women's attire. The cessation of this use for Henderson's in the 1950s demonstrates the retraction of the hat industry, associated with social changes and the emancipation of women during the twentieth century.</i></p> <p><i>The building represents a good example of a multi-storey factory within the inner-city suburbs of the City of Sydney from the Federation period. The building typology markedly differs to the later single-story sawtooth-roofed factories of the inter-war and post war periods located in southern Sydney.</i></p> <p><i>Architecturally, the building demonstrates typical features of the Federation warehouse style including the rectangularity of the facade divided into bays by brick piers, terminated by an entablature and moulded cornice along the parapet wall, heavy masonry construction, vertical emphasis through the three central bays recessed behind the plane of piers at the upper three levels, face brickwork, and ground floor emphasised by projecting bands along the piers and an arched entrance. The regular pattern of vertically-proportioned paired windows with shallow or flat arched lintels, surviving timber double-hung sash windows with delicate central glazing bar and the main entrance accentuated by an arched opening and pronounced keystone are also characteristic of this architectural period. Evidence of the original painted letter signage remains along the entablature. The dichromatic banded brickwork for the recessed central upper bays and framing the entrance are an uncommon example of decorative brickwork for buildings of the Federation warehouse style in Surry Hills.</i></p> <p><i>The building makes an important contribution to the streetscapes of Randle Street and Lane and Elizabeth Street, located in close proximity to Central railway station and the corner of Elizabeth Street. The imposing height of the building for its period of construction, no setback from its two street frontages and irregular building footprint following the non-grid street pattern make the building a distinctive feature in the streetscapes, which is visible from a number of near and distant aspects in the local neighbourhood.</i></p> <p><i>The building may have value to the community of former workers of R.C. Henderson, and to the general community for its connection to the well-known Henderson hats from the 1910s to the 1950s.</i></p> <p><i>The former R.C. Henderson factory forms part of one of the largest known collections of industrial and warehouse buildings of its kind in Australia, which records City of Sydney's past as one of only two historic industrial heartlands in Australia. This collection of buildings provides evidence of Australia's twentieth century transformation through industrialisation when Sydney became one of the largest industrialised cities in the South Pacific.</i></p> <p><i>The former R.C. Henderson factory is of local heritage significance in terms of its historical, association, aesthetic, and representative value.</i></p>
Approved project impact	No impacts
Additional impact of the proposed modification	<p>Indirect impact – setting (removal of the Bounce Hostel (the former MGM Building) and introduction of the proposed eastern entry)</p> <p>Potential direct impact – vibration (demolition of the former MGM building and excavation of the eastern entry)</p>
Revised heritage	The frontage of the heritage item is oriented to the east and Randle Street, and away from the proposed eastern entry. The former MGM building, to be demolished, does not contribute to the setting of the heritage, or the Randle Lane facade.



Former R. C. Henderson Ltd Factory	
impact assessment	<p>The closest façade of this item is expected to experience vibration levels above the screening level for cosmetic damage. Demolition of the Bounce Hostel (the former MGM building) and excavation within Randle Lane may result in minor vibration impacts to the heritage item.</p> <p><b>Indirect impact – negligible (setting)</b></p> <p><b>Potential direct impact – minor (vibration)</b></p>



**HISTORICAL  
ARCHAEOLOGICAL  
ASSESSMENT AND  
RESEARCH DESIGN  
– CENTRAL WALK  
ADDENDUM**

APPENDIX F



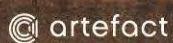




# Central Walk - Addendum Archaeological Research Design

Addendum Archaeological Research  
Design

Report to JAR  
June 2017



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## 1.0 INTRODUCTION

This addendum report constitutes an archaeological research design for Central Walk, a proposed modification to Sydney Metro City & Southwest Chatswood to Sydenham project (the approved project). This report provides a detailed methodology for investigation of potential non-Aboriginal archaeological resources that would be impacted by ground disturbing works for Central Walk at Central Station.

This report has been prepared as an addendum to the Historical Archaeological Assessment & Research Design for the approved project (Artefact, October 2016).

### 1.1 Project Background

Planning approval for Sydney Metro City & Southwest Chatswood to Sydenham project was granted by the Minister for Planning under Part 5.1 of the EP&A Act on 9 January 2017.

On 22 March 2017, the Premier of NSW and the Minister for Transport and Infrastructure announced Central Walk as the first step in revitalising Central Station. Central Walk would involve the construction and operation of a new east concourse and a new eastern entry (from Chalmers Street). Suburban platform works would also be carried out including suburban platform refresh and re-leveling.

Central Walk is being progressed as a proposed modification to the approved Sydney Metro City & Southwest Chatswood to Sydenham project in accordance with section 115ZI of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

An overview of the key elements of the project are summarised in Table 1

**Table 1: Key features of the Central Walk modification**

Component	Description of activities
East concourse	The concourse would provide an accessible connection to the suburban and metro platforms at a common floor level to cater for the growing demands at the station now and in the future. The east concourse would connect the existing T4 Eastern Suburbs Line concourse with the future metro concourse with new escalators and a lift to each of the aboveground suburban platforms.
Eastern entry	A new entry / exit would be provided to Central Station and the east concourse from Chalmers Street. This would provide a direct interchange with light rail services. The eastern entry would be located at the site of the Bounce Hostel. A future connection to Randle Lane and/or Elizabeth Street would be safe guarded.
Suburban platform works	A general upgrade of lighting, signage and finishes and removal of platform clutter, and suburban platform raising / re-leveling to provide a consistent height and finish across the platforms.

Component	Description of activities
Services route	<p>A combined services route would run under the floor of the new east concourse providing a link from the proposed plant and services in the existing unused platforms located above the Eastern Suburbs platforms to the metro basement services level.</p> <p>From the Sydney Metro concourse, the services route would run:</p> <ul style="list-style-type: none"> <li>• Through the services building at the southern end of the metro platforms</li> <li>• On a gantry to the south of the intercity platforms across to platforms 4/5</li> <li>• Through a trench from the south of platform 4/5 and through platform 4/5 to the baggage tunnel</li> <li>• Through a vertical bore through platform 4/5 to the baggage tunnel below.</li> </ul>
Underbore (Lee Street substation)	<p>An underground connection for an electrical connection from the Lee Street substation (currently under construction) to the metro services building to the south of platform 13/14. This would pass beneath the intercity tracks.</p>
Underbore (Chalmers Street substation)	<p>An underground connection for an electrical connection from the Chalmers Street substation (currently under construction) to the proposed plant and services on the existing unused platforms 26 / 27 (beneath the Eastern Suburbs Concourse). This would connect to new electrical equipment within the existing Prince Alfred Substation building (this new equipment is being placed in the Prince Alfred Substation building as part of the Chalmers Street substation project).</p>
Devonshire Street tunnel gateline	<p>Elements within the vicinity of the Devonshire Street ticketing gate would be modified. This includes the demolition of an existing service room and realignment of the current ticket gates.</p>

The proposed construction activities for Central Walk broadly include:

- Demolishing / repurposing of buildings and relocating services
- Excavation works and civil works, including excavation of the east concourse as well as excavation works to establish the eastern entry
- Platform works such as removal or relocation of nominated items and structures, installation of new finishes, fixtures and tiling, modifications to overhead wiring (where attached to canopies), strengthening platform edges, provision of new openings within the platform canopies to enable installation of the proposed lifts, excavation for vertical transport (lifts and escalators) and concourse openings
- Fit-out of the east concourse and eastern entry (vertical transport, services, etc)
- Testing and commissioning
- Temporary ancillary facilities and works, including a temporary services gantry.

Two temporary construction sites would be required to accommodate a site office, amenities, laydown and storage area for materials. These are:

- Sydney Yard – the existing land and other laydown areas within the rail yard would be used concurrently with the Sydney Metro works and accessed primarily from Regent Street via the Sydney Yard Access Bridge, which is to be constructed as part of the approved project
- Eastern entry site – would provide access into the east concourse and eastern entry.



In addition areas located within the station would be temporarily used to store materials and support construction works (including the use of platforms and track areas occupied during rail possessions, and decommissioned stairwell areas).

## 1.2 Previous heritage assessments

This archaeological research design is informed by previous heritage assessments, which have appraised the archaeological potential and significance within the study area as modified. These assessments are:

- Artefact Heritage 2017, Heritage Assessment for the proposed modification
- Artefact Heritage 2016, *Sydney Metro City & Southwest Chatswood to Sydenham – Historical Archaeological Assessment and Research Design*

## 1.3 Study area

The study area of the project as modified is illustrated on Figure 1. This addendum ARD provides management for potential archaeological resources within the Central Walk portion of the study area only, as shown in Figure 2.

The study area is located in the City of Sydney LGA.

## 1.4 Report Authorship

This report was prepared by Duncan Jones (Heritage Consultant). Management input and review was provided by Jenny Winnett (Senior Heritage Consultant).

Figure 1: Study area of the project as modified

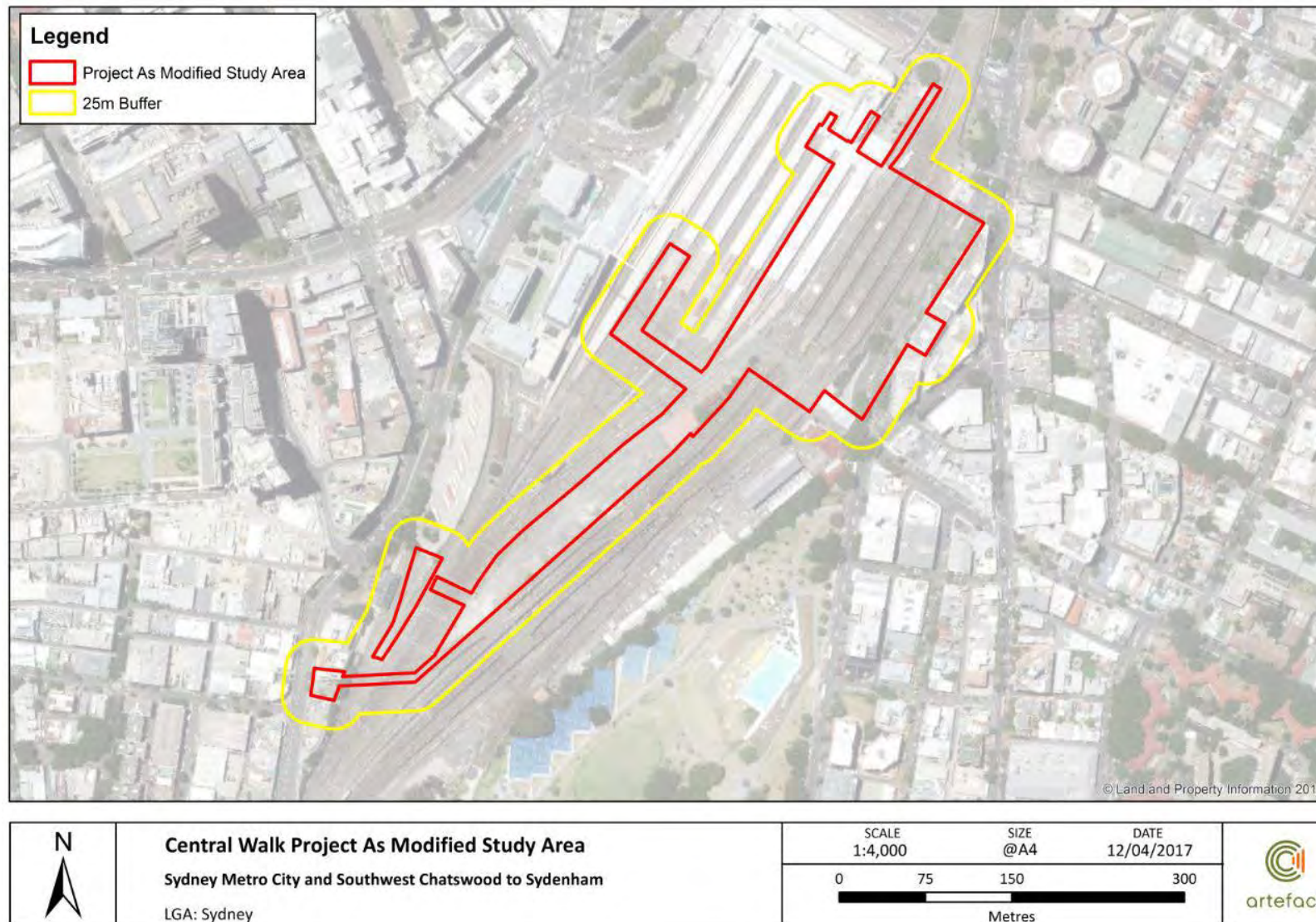
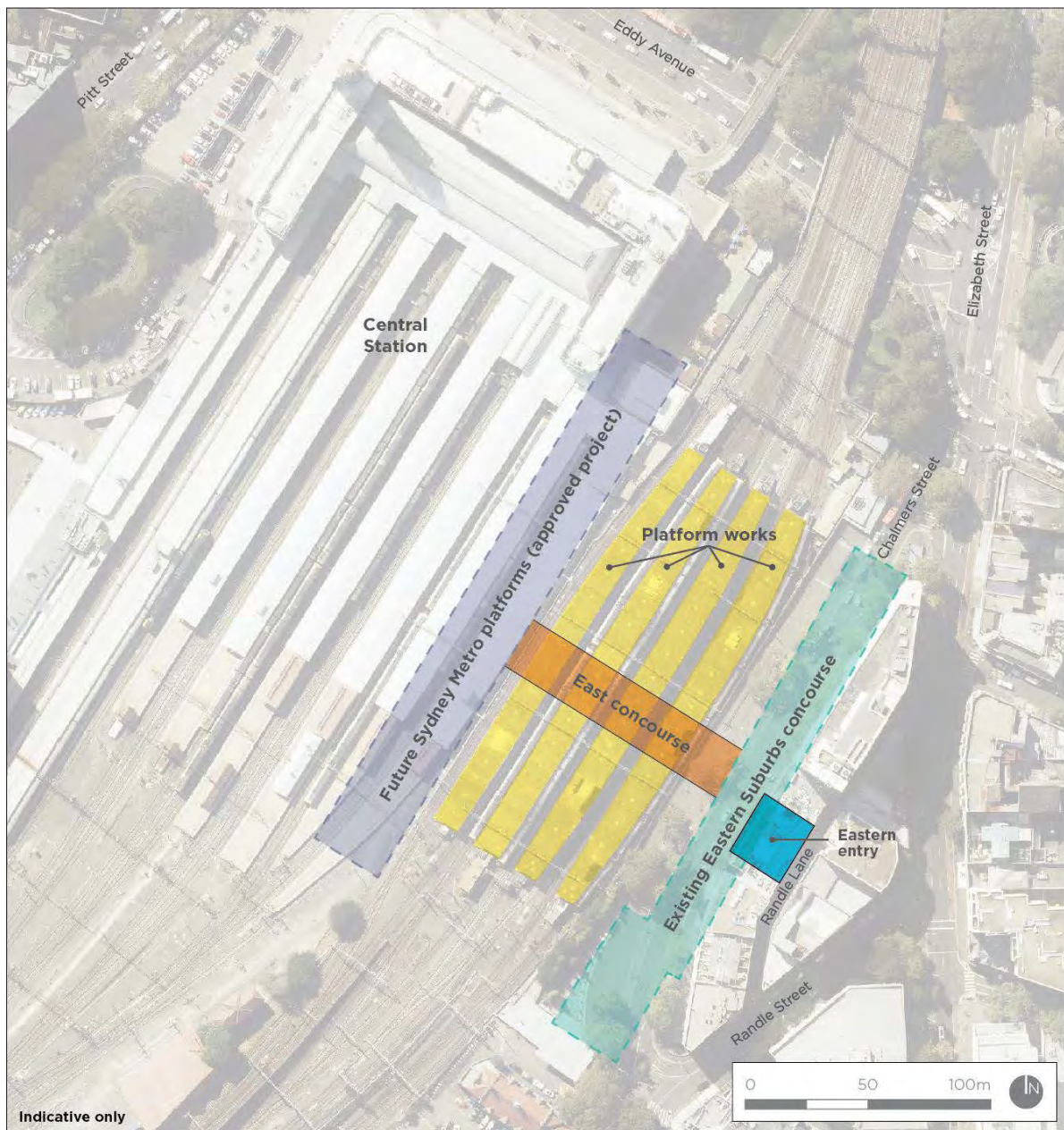




Figure 2: Key features of the Central Walk modification



15021\_Central EIS2 Fig 1-3 & 6-1



## 2.0 OVERVIEW OF ARCHAEOLOGICAL POTENTIAL

Previous assessments have provided historic context and a complete description of archaeological potential in the study area. A summary of the archaeological potential and significance of those remains is provided in Table 2.

**Table 2: Summary of potential archaeological resources and significance**

Potential archaeological resource	Grading of potential	Grading of significance
Devonshire Street cemetery	Low	State
First and Second Sydney Railway Stations	Moderate	Local - State
Earlier phases of Third Central Railway Station platforms and infrastructure	Moderate	Local
Former Railway Place residences	High (former MGM Building footprint) Low (Chalmers Street footpath)	Local
Early service lines (sewerage and stormwater)	High (South Western Main Branch) Low (Prince Alfred Sewer) Moderate (early truncated service lines)	Local

### 2.1 Statements of significance

#### 2.1.1 Devonshire Street Cemetery

The Devonshire Street Cemetery was the second formal burial ground established in the colony in 1820, and continued in use until the 1860s. Despite the exhumation and levelling of the cemetery in 1901 and 1902, the likelihood that deeper burials, or burials that may have been overlooked during the rapid exhumation process, may remain.

Archival records can supply some information on the identities of the people who were buried at the cemetery, however this record may not be complete. Pauper's graves and lacunae within the historical record may mean that some interments are incompletely documented. The division of the burials into separate congregational areas may have material distinctions between the burial evidence of the graves. Forensic, osteological and isotopic analysis of skeletal remains can yield information about the health and diet of the interred, information which is not available from other sources. Burial ornamentation such as tombstones and tomb structures provide valuable symbolic evidence of funerary practices and attitudes towards death. These types of symbolic values are understood for wealthier burials from historic records, however the large number of poor or historically unmentioned people in the early colony are not as clearly understood from archival records. Burials from the period of the early colony at around 1820, particularly during the convict period (before 1840), and up to 1860 when the cemetery closed, are rare and highly valuable archaeological resources.

The heritage significance of potential remains is constrained by the degree of intactness of any deposits. It is likely that most of the graves were exhumed and that the original landscape that they were buried in has been nearly entirely disturbed. However, the possibility of deeper intact deposits remaining below the level of Central Station cannot be discounted. Geotechnical evidence of the soil profile along the rail corridor at Central Station shows that a significant (up to three metres) sand layer is intact below rail ballast and backfill. On the eastern side of the footprint of the former cemetery, geotechnical investigations have shown that the area is largely modern fills overlying Ashfield Shale (Figure 3). This result is consistent with historical records which show that the sand dune on which the former cemetery was located was excavated almost entirely to create a level surface for the construction of the third (current) Central Station. Even if burials in these potentially residual pockets of in situ sand were removed, the location and alignment of grave cuts associated with these interments would provide important archaeological information. Disarticulated remains in unstratified fills would also have research potential.

### 2.1.2 First and Second Railway Station

The first railway station at Central (then Redfern Station) represents the terminus of the second railway in Australia and the first railway in New South Wales. The construction of this railway and station was considered a significant event in the colony at the time. The first railway station building was conceived as a temporary structure and archaeological remains of this structure are likely to be highly significant due to its potential research and technical value, and historical connections with the development of infrastructure in New South Wales.

The second railway station was the central terminus of the expanding railway network in the 1870s. By the 1870s when the second station was constructed, railway networks had been established in rural areas in order to transport goods, particularly wool, to Sydney ports for export. As the terminus point and one of the principal maintenance stations for the goods rail network, archaeological remains associated with the second railway station could have historic, associative, technical values and research potential.

Archaeological remains of the first and second Sydney railway terminals would have historical and associative significance and could have provide information about railway functions and engineering at the advent of the rail industry in NSW. However, whilst these are of historical importance, the potential remains are not expected to be intact due to subsequent ground works associated with the ongoing use and modification of Central Station. As these remains are unlikely to be intact, other values, such as technical or research potential, are lessened. The potential archaeological remains associated with the first and second railway station are of local heritage significance (Criteria A, B and C). Remains of the first station are likely to be of state significance (Criteria A, E and F).

### 2.1.3 Earlier Phases of Third (Current) Central Railway Station

The original Central Station platforms were constructed as brick masonry walls with a vertical profile. In accordance with the Heritage Platforms Conservation Management Strategy, this type of platform design is not recognised as an uncommon or unique material design. Design plans of the original platform configuration for the third Central Station are accessible. However, the sequence of platform modifications since their construction is likely to provide information on the alteration over time of the operation of Central Station. It is likely that portions of these former platform surfaces and walls are significantly intact.

#### 2.1.4 Former Railway Place Residences

The archaeological remains of the former Railway Place residences have the potential to provide information relating to the early development of Surry Hills, as an urbanised suburb near the first and second railway stations and the centre of the city of Sydney. The analysis of remains would provide information related to the preferences and socio-economic standing of the occupants of Railway Place, traditionally considered to have been a 'working-class' area.

The archaeological remains of the former Railway Place residences would have local significance under Criteria A and E.

#### 2.1.5 Early Service Lines (Sewerage and Stormwater)

Early sewerage and stormwater services have technological and representative significance as they were greatly responsible for improving public health, hygiene and living standards for the city's residents from the late 1800s. The South Western Main Branch of the Bondi Ocean Outfall Sewer (BOOS) is representative of engineering construction techniques of the late 1800's and of the city's early infrastructure.

Substantially intact sections of early service lines may have research significance. The drains within Central Station, with the exception of the South Western Main Branch of the BOOS, are unlikely to be intact, and would therefore have little significance.



## 3.0 PROPOSED WORKS

### 3.1 East concourse

The east concourse would be located below the existing suburban platforms (platforms 16 to 23), extending from the future north-south metro concourse, and connecting into the Eastern Suburbs concourse (see **Error! Reference source not found.**). Four escalators and one lift would link from the concourse to each island platform (platforms 16 to 21), and three escalators and one lift would link from the concourse to platforms 22 / 23.

The installation of vertical transport for the east concourse would require the lift shafts to penetrate the existing platform canopies. Minor patching would be required in these locations.

#### 3.1.1 East concourse construction

Construction of the east concourse would use a mined method to minimise the impacts to the platforms and platform canopies and the extent of work required during rail possessions. Construction of the east concourse would involve surface works on the platforms and underground work beneath the platforms.

Surface platform works would include:

- Temporary support for the existing canopies
- Demolition of the existing stair openings from the platforms to the existing underground tunnels, including (as numbered from north to south) the fourth set of stairs on platforms 20-23 and the fourth and fifth sets of stairs on platforms 16-19
- Reinforcing the existing brick platform edges, and supporting and re-arranging existing canopy foundations
- Piling and excavation of the new platform openings for escalators and lifts
- Providing necessary support (likely through pre-cast concrete elements) for the future canopy tube support (during underground works)
- Re-installing platform furniture.

Underground works, supported by the proposed eastern entry construction site and accessed via the unused T4 Eastern Suburbs line platforms 26 and 27, would include:

- Installation of the canopy tube ahead of the excavation works. A canopy tube involves drilling a number of perforated pipes or canopy tubes horizontally above the area to be excavated, which are then injected with grout, to establish a protective cover under which the tunnel can then be excavated. This construction technique is regularly used where there is insufficient ground cover.
- Excavation of the concourse under the tracks and platforms, with ground support
- Final excavation and connection of the future escalator and lift openings

- Progressive construction of the services tunnel with concrete elements to form the services tunnel roof and concrete base slab
- Construction of concourse walls and roof, concourse columns and walls of escalator shafts
- Installation of electrical and mechanical equipment in the services tunnel.

The eastern brick boundary wall of the station would be removed prior to excavation work for the concourse to avoid any damage that may be caused by vibration and subsidence. On completion of works the wall would be reconstructed.

## 3.2 Eastern entry

The new eastern entry would be located at 20-28 Chalmers Street, on the site of the current Bounce Hostel. Three escalators and two lifts would provide vertical transport to and from the new east concourse. A new gateline would be installed at the bottom of the vertical transport. The location and key features of the eastern entry are shown on **Error! Reference source not found.**

The connection of the eastern entry to the Eastern Suburbs concourse would require modifications to the existing concourse including remodelling of an existing staircase, removal of an existing ramp and installation of a new lift.

### 3.2.1 Eastern entry construction

The following activities would be required to construct the eastern entry:

- Excavation of a shaft to form the proposed entry. Excavation works would proceed down to the level unused platforms of the T4 Eastern Suburbs Line. Cut-and-cover excavation works would also be required through Randle Lane and through the footpath and the future cycleway on the eastern side of Chalmers Street
- Civil and structural works (including structural supports for the entrance building on street level)
- Excavation of a new opening through to the unused platforms to provide access for the construction of the east concourse and facilitate the storage plant and installation of services
- Modification of the existing Eastern Suburbs Concourse (including demolition of existing back of house rooms, the existing ramp, widening of the existing stairs and installation of new lift).

## 3.3 Suburban platform works

### 3.3.1 Platform refresh

Platform refresh works would be carried out on the suburban platforms (16-23) to provide a consistent customer experience between the old and the new platform areas. The platform refresh works would include demolition of platform buildings, redundant staircases and services infrastructure; de-cluttering (ie removal of seating, bins and vending machines); new painting; installation of new signage, lighting and tiles; and provision of platform furniture.

### 3.3.2 Platform raising / re-levelling

To achieve a consistent finish and height across the suburban platforms a topping would be applied and the platform coping (edges) would be raised so that there is a slope back towards the centre of the platform. This may also involve localised structural repairs to the existing platform edges. Platform re-levelling would not be undertaken where significant structural works would be required to achieve a consistent height. A strip drain would also be installed in the centre of the platform to collect rainfall which would then connect to the existing platform drainage.

## 3.4 Temporary services route

The location of the permanent combined services route is proposed to be modified as part of Central Walk. This revised route would however, require a temporary services route so that these services would not be impacted by construction for the approved project and Central Walk.

The temporary services route would carry high voltage power, low voltage power, communications and hydraulic services. The temporary services route would be generally to the south of the platforms as shown on Figure 7-3. This route would include the following features:

- An overhead gantry from the eastern side of Central Station (commencing near the Devonshire Street / Chalmers Street intersection) across the suburban rail lines. The gantry structure would be similar to other overhead support structures in this location
- Attached to temporary hoarding adjacent to the Sydney Metro works
- Located in protected conduit along the ground to the south of the Sydney Metro excavation through the Sydney Yard construction site
- An overhead gantry across the intercity rail lines to Platform 4 / 5
- Trenched in the location to the south of Platform 4 / 5 and through Platform 4 / 5 to the baggage tunnel. The trench would be around 300 millimetres wide and 300 millimetres deep
- Through a vertical bored hole through Platform 4 / 5 to the baggage tunnel below.

Following construction, the section of the temporary route to the east of the metro concourse would be removed with the permanent route located beneath the east concourse. As described in Chapter 6 (Modification description – operation), the western portion (to the west of the metro southern services building) would form part of the permanent combined services route.

## 3.5 Ancillary infrastructure and services

### 3.5.1 Service route and electrical infrastructure

#### 3.5.1.1 Service route

A combined services route would run under the floor of the new east concourse providing a link from the proposed plant and services in the existing unused platforms located above the Eastern Suburbs platforms to the metro basement services level.

From the Sydney Metro concourse, the services route would run:

- Through the services building at the southern end of the metro platforms
- On a gantry to the south of the intercity platforms across to platforms 4/5



- Through a trench from the south of platform 4/5 and through platform 4/5 to the baggage tunnel
- Through a vertical bore through platform 4/5 to the baggage tunnel below.

Ventilation would be provided to the east concourse and proposed services and plant in the unused platforms 26 / 27 through an outlet near the Devonshire Street station entry.

#### **3.5.1.2 Electrical infrastructure**

A connection between the Chalmers Street Substation (currently under construction) and the services route and plant in the existing unused platforms 26 / 27 (beneath the Eastern Suburbs Concourse) would be provided as part of Central Walk.

An underground connection for an electrical connection between the Lee Street substation (currently under construction) and the approved Sydney Metro services building to the south of platform 13/14 would also be excavated. This would pass beneath the intercity tracks.

### **3.5.2 Ventilation and life safety systems**

Mechanical ventilation of the east concourse would be required for heat removal, air flow and passenger amenity. The mechanical plant to service the ventilation system would be located within the unused platforms 26 / 27 (beneath the Eastern Suburbs Concourse).

### **3.5.3 Communication systems**

A number of communication systems would be installed within the east concourse. The location and requirements of these communication systems would be further developed in consultation with Sydney Trains.

### **3.5.4 Drainage infrastructure**

#### **3.5.4.1 Surface drainage**

Platform canopy, platform and track drainage catchments impacted by construction would be reinstated and continue to drain through the unaffected pipes. The design of the surface stormwater drainage would maintain catchment areas as close as possible to the existing system.

#### **3.5.4.2 Subsurface drainage**

As part of the east concourse construction, permanent pumped drainage piping would be provided in the combined service route to tie back into the existing station drainage system.

## **3.6 Devonshire Street tunnel gateline**

Elements within the vicinity of the Devonshire Street ticket gate would be modified. This includes the demolition of an existing service room and realignment of the current ticket gates.

## 4.0 IMPACTS TO ARCHAEOLOGICAL RESOURCES

### 4.1 Devonshire Street cemetery

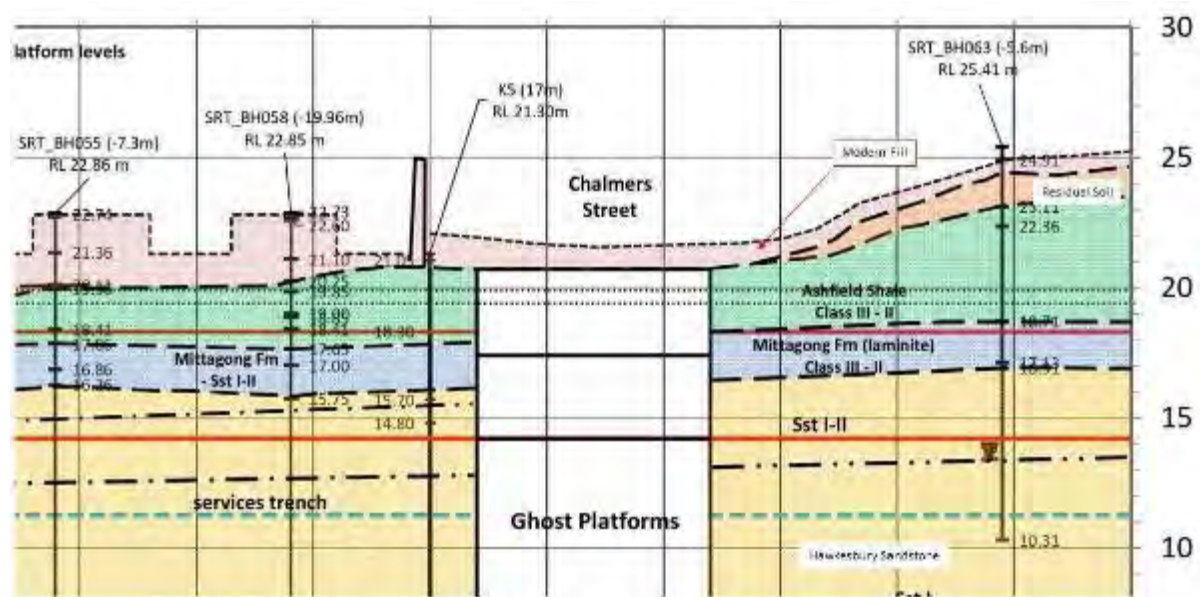
Historical sources indicate that burials within the former Devonshire Street Cemetery were exhumed prior to the construction of the Sydney Terminal in the early years of the Twentieth century. Investigation of comparative examples, however, suggests that exhumation processes were often incomplete, leaving partial, and sometimes whole burials, in situ. Therefore, while the potential for encountering remains (intact burials or disarticulated skeletons) is low, it cannot be entirely discounted.

On the eastern side of the footprint of the former cemetery, geotechnical investigations have shown that the area consists of modern fills overlying Ashfield Shale (Figure 3). This result is consistent with historical records which show that the sand dune on which the former cemetery was located was removed to create a level surface for the construction of the third (current) Central Station. Whilst unlikely, there is some potential that residual pockets of intact sand, with unexhumed burial remains, may exist. Excavation works for the construction of the east concourse would involve horizontal excavation to a depth of up to 6 metres below the Chalmers Street level.

Due to the limited potential for encountering archaeological remains in this area, archaeological monitoring would be undertaken during excavation works. Should potentially intact historic deposits be identified during excavation, the excavating machinery should be removed from the working face of the excavation and the nature and extent of any deposits identified by the Excavation Director. Further archaeological investigation may be required should substantial intact deposits or human bone material be identified.

Further refinement of this archaeological methodology would be required once detailed constructability information is known. These refinements would be included in the AMS for the project as modified.

**Figure 3: Geological cross section of Central Station, detail of Central Walk study area, in the vicinity of the unused Eastern Suburbs Railway platforms.**



## 4.2 First and second Sydney railway stations

Works with the potential to encounter the remains of the first and second Sydney Railway Station include ground-disturbing works associated with the installation of a new temporary and permanent services routes to carry services and excavation of a shaft adjacent to the entrance of the Devonshire Street Tunnel. There is a moderate potential that archaeological remains relating to these phases of the station are located in this area.

Excavation for the access shaft near the Railway Institute building should be archaeologically monitored to ensure any remains associated with the first and second railway stations are not impacted. This methodology should be further refined once detailed constructability information is known and included in the AMS for the project as modified.

## 4.3 Earlier phases of the third (current) Central Railway Station (including remains within platform structures)

There is moderate potential that archaeological remains associated with earlier phases of the third (current) Central Station would be located throughout the study area. Any remains are unlikely to be intact due to alterations and modifications that have taken place within the station precinct and yards throughout its use-life. There is low potential that evidence of earlier platform structures would be located within the fill used in the construction of the current platforms. Unexpected finds, however, cannot be discounted.

The extent to which legible and phase-identifiable platform structures remain in the project area is uncertain. A program of archaeological monitoring should be conducted during excavation works on platforms to identify and record any archaeological remains. This methodology should be further refined once constructability information is known and included in the AMS for the project as modified.

## 4.4 Early service lines (sewerage and stormwater)

It is possible that portions of early unmapped service lines may be identified during excavation works (the South Western Main Branch of the BOOS and Prince Alfred Sewer are outside the Central Walk study area).

Works with the potential to encounter remains of this type include excavation within the Sydney Yard for the installation of a new temporary and permanent services route and excavation of a shaft adjacent to the entrance of the Devonshire Street Tunnel. Archaeological monitoring should be conducted during these excavation works. This methodology should be further refined once constructability information is known and included in the AMS for the project as modified.

## 4.5 Former Railway Place residences

There is high potential that archaeological remains associated with residences associated with the former Railway Place would be located within the footprint of the Bounce Hostel building and within Randle Lane. There is also potential that archaeological remains of residences remain within the Chalmers Street frontage / footpath, although these remains are unlikely to be intact (due to the installation of services and excavation for the Eastern Suburbs Railway). It is assumed that the current building does not have a basement. While archaeological remains may have been impacted by construction of the Bounce Hostel building and installation and upgrading of service lines, overall, they are likely to be intact. It is also possible that partial and truncated remains may be preserved in the Chalmers Street frontage/footpath.



Demolition and excavation for the eastern entry would have a major impact on this archaeological resource, resulting in its complete removal. A program of archaeological open area salvage excavation should be enacted to appropriately manage the archaeological resource.

The ground slab of the Bounce Hostel building should be removed under archaeological supervision, following the demolition of the standing structure of the building. Following the removal of the ground slab, open area salvage should be conducted. This methodology should be further refined once constructability information is known and included in the AMS for the project as modified.

## 5.0 SUMMARY OF ARCHAEOLOGICAL IMPACTS AND MANAGEMENT

A summary of impacts and the recommended archaeological management strategies are shown in Table 3.

**Table 3: Archaeological impacts and management strategies in the study area**

Potential archaeological resource	Significance	Archaeological potential	Proposed impact	Archaeological Management
Devonshire Street cemetery	State	Low	<ul style="list-style-type: none"> <li>Mined excavation of eastern concourse</li> <li>Minor impact to archaeological resources</li> </ul>	<ul style="list-style-type: none"> <li>AMS</li> <li>Monitoring</li> <li>Exhumation Policy applies</li> </ul>
First and Second Sydney Railway Stations	Local	Moderate	<ul style="list-style-type: none"> <li>Excavation within the Sydney Yard for the installation of the services route</li> <li>Minor impact to archaeological resources</li> </ul>	<ul style="list-style-type: none"> <li>AMS</li> <li>Monitoring / Salvage if required significant finds identified</li> </ul>
Earlier phases of Third Railway Station platforms and infrastructure	Local	Moderate	<ul style="list-style-type: none"> <li>Removal of portions of platforms for introduction of elevators and lifts</li> <li>Trenching within platform 4/5 for permanent services route</li> <li>Minor impact to archaeological resources</li> </ul>	<ul style="list-style-type: none"> <li>AMS</li> <li>Monitoring</li> </ul>
Early services	Local	Low	<ul style="list-style-type: none"> <li>Excavation within the Sydney Yard for the installation of the services route</li> <li>Minor impact to archaeological resources</li> </ul>	<ul style="list-style-type: none"> <li>AMS</li> <li>Monitoring / Salvage if required significant finds identified</li> </ul>
Former Railway Place residences	Local	High (former MGM Building footprint) Low (Chalmers Street footpath)	<ul style="list-style-type: none"> <li>Demolition of Bounce Hostel building</li> <li>Excavation of shaft for eastern entry and to support mined excavation of east concourse</li> <li>Total impact to archaeological resources</li> </ul>	<ul style="list-style-type: none"> <li>AMS</li> <li>Monitoring demolition</li> <li>Archaeological Salvage</li> </ul>

## 6.0 RESEARCH DESIGN

### 6.1 Historic themes

Historical themes are a way of describing important processes or activities which have significantly contributed to Australian history. Historical themes are described at a national and state level. The Heritage Council of NSW has prepared a list of state historic themes relevant to the demographic, economic and cultural development of the state (Heritage Council 2006). The use of these themes provides historical context in order to allow archaeological items to be understood in a wider historical context.

#### 6.1.1 Devonshire Street Cemetery

Historic themes relevant to the Devonshire Street Cemetery are outlined in Table 4.

**Table 4: Historic themes for Devonshire Street Cemetery**

Australian theme	NSW theme	Explanatory Notes	Comments
3. Developing local, regional and national economies	Environment – cultural landscapes	Activities associated with the interaction between humans, human societies and the shaping of their physical surroundings	The former sand dunes in the east of the study area were largely removed when the Devonshire Street Cemetery was exhumed. The sloping land on the western side of the study area was built up to level the site for the construction of Redfern (now Central) station.
8. Developing Australia's cultural life	Religion	Activities associated with particular systems of faith and worship	The Devonshire Street Cemetery was divided into several different portions for the interment of people of different faiths. Denominational differences may be reflected in their burial remains.
9. Marking the phases of life	Birth and death	Activities associated with the initial stages of human life and the bearing of children, and with the final stages of human life and disposal of the dead	The Devonshire Street Cemetery was the second public cemetery in the town of Sydney, consecrated in 1821. Intact archaeological remains would be of high research potential.

#### 6.1.2 First and Second Sydney Railway Stations

Historic themes relevant to the First and Second Sydney Railway Stations are outlined in Table 5.



**Table 5: Historic themes for First and Second Sydney Railway Stations**

Australian theme	NSW theme	Explanatory Notes	Comments
3. Developing local, regional and national economies	Industry	Activities associated with the manufacture, production and distribution of goods	Redfern (now Central) Station was a significant industrial site for the manufacturing of locomotive engines, carriages and infrastructure throughout the 19 <sup>th</sup> century.
3. Developing local, regional and national economies	Technology	Activities and processes associated with the knowledge or use of mechanical arts and applied science	Redfern (now Central) Station was the first locations for the introduction of steam locomotive and railway technology in New South Wales.
3. Developing local, regional and national economies	Transport	Activities associated with the moving of people and goods from one place to another, and systems for the provision of such movements	Redfern (now Central) Station was the terminus of New South Wales' first railway line. It remains the central hub of the New South Wales railway system.

### 6.1.3 Earlier Phases of the Third Railway Station Platforms

Historic themes relevant to the earlier phases of the third railway station platforms are outlined in Table 6.

**Table 6: Historic themes for earlier phases of the third railway station platform**

Australian theme	NSW theme	Explanatory Notes	Comments
3. Developing local, regional and national economies	Transport	Activities associated with the moving of people and goods from one place to another, and systems for the provision of such movements	Redfern (now Central) Station was the terminus of New South Wales' first railway line. It remains the central hub of the New South Wales railway system.

### 6.1.4 Early Water and Sewerage Services

Historic themes relevant to the early water and sewerage services are outlined in Table 7.

**Table 7: Historic themes for early water and sewerage services in the study area**

Australian theme	NSW theme	Explanatory Notes	Comments
4. Building settlements, towns and cities	Utilities	Activities associated with the provision of services, especially on a communal basis	The Prince Alfred Sewer was constructed in the late nineteenth century to expand the developing sewerage infrastructure in south Sydney

### 6.1.5 Former Railway Place Residences

Historic themes relevant to the former Railway Place residences are outlined in Table 8.

**Table 8: Historic themes for former Railway Place residences**

Australian theme	NSW theme	Explanatory Notes	Comments
3. Developing local, regional and national economies	Industry	Activities associated with the manufacture, production and distribution of goods	Historical records show that residences on Railway Place housed workers associated with the former Devonshire Street cemetery in the 1860s (stone masons, carpenters, cartwrights); while in the 1880s these residences were largely occupied by railway workers. Early industries may have been practiced at these residences, of which archaeological remains may survive.
4. Building settlements, towns and cities	Accommodation	Activities associated with the provision of accommodation	Terrace housing on Railway Place was the residence for a working class community associated with nearby industries. Archaeological remains may provide information on the occupants of these terraces.
8. Developing Australia's cultural life	Domestic life	Activities associated with creating, maintaining, living in and working around houses and institutions	Terrace housing on Railway Place was continuously occupied by working class residents from the 1860s until the land was resumed for the expansion of Central Station in 1900. Archaeological remains may provide information on the domestic lifestyles of these occupants

## 6.2 Research questions

Archaeological resources within the proposed modification area have the potential to answer a number of research questions. Additional research questions may be added if the archaeological resource allows for further, or more in-depth, investigation. The following research questions have been provided to guide the archaeological investigative program.

### 6.2.1 Devonshire Street Cemetery

- Is the sand deposit located below the present rail corridor an *in situ* remnant of the former Devonshire Street Cemetery, or is it landscaping or infill?
- If it is infilled but still local Quaternary sand, does it bear artefacts or remains relating to the Devonshire Street Cemetery, even if they are potentially out of context?
- Did landscaping associated with the development of the third Central Station building remove all evidence of burials?
- Were all the graves exhumed from the Devonshire Street Cemetery?
- If graves were not exhumed, who were the people who were interred in them?

- What was the health and diet like of individuals buried in the Devonshire Street Cemetery?
- Are remnants of the outer and denominational walls still extant?
- Are there any intact tombs and tombstones in the Devonshire Street Cemetery?

#### 6.2.2 First and Second Sydney Railway Station

- Are there intact remains of the first and second Sydney railway stations below the rail corridor? Are these remains legible?
- Has the development of Central Station over time, particularly construction works associated with the building of the third (current) station, completely remove earlier archaeological deposits associated with the first and second stations?
- Can archaeological evidence of former structures from the first and second railway stations be discriminated from later post-1906 building adaptations?
- Is there archaeological evidence before 1906 of the changes in use of former carriage sheds and workshops if they were converted into other types of station buildings?

#### 6.2.3 Earlier Phases of the Third (Current) Railway Station Platforms

- Is there any evidence of former platforms located below or within the present-day station platforms?
- Can platform remnants provide information on design and construction techniques at Central Station which have not been previously recorded?
- Can original fabric of former platform remnants be identified, or are former platform remains heavily truncated or impacted by the developing use of the station over the last century?

#### 6.2.4 Early Water and Sewerage Services

- Natural water courses in the Central Station area were enclosed in culverts to form the early stormwater drainage system of the area. Can any enclosed natural drainage lines be discerned in the study area?
- Are there remains of the original fabric of the Prince Alfred Sewer? To what extent has the 1850s-era drain been replaced with new infrastructure?
- Do nineteenth century water and sewerage infrastructure demonstrate unique architectural features or construction techniques?



#### 6.2.5 Former Railway Place Residences

- Are archaeological remains of mid-nineteenth century terrace housing intact within the project area? Are the remains legible?
- Former nineteenth century housing was resumed and built over in the study area in 1900. To what extent has subsequent development (former MGM building construction, road and utility service works) impacted any archaeological remains?
- Are there archaeological remains associated with any intact artefact bearing deposits, such as yard scatters or potential underfloor deposits? Are cisterns, cesspits, tanks or wells intact, and are they artefact-bearing?
- Historical records from the 1860s show that the occupants of terraces on Railway Place were largely employed in industries related to the adjacent burial ground (stone masons, carpenters, cartwrights). To what extent were these occupations practiced at their residences? Does archaeological evidence of these trades remain?
- Historical records from the 1880s show that the occupants of the residential terraces were largely railway workers, reflecting the growth of industry surrounding the second railway station after it was constructed in 1874. Can railway worker occupations be recognised from domestic archaeological remains in the study area? Can the change in occupations of the occupants show a material signature?
- How do residential sites in the study area compare with other excavated working class residential sites, both in Surry Hills and the wider Sydney region?

## 7.0 ARCHAEOLOGICAL METHODOLOGY

### 7.1 Introduction

A complete series of archaeological methodologies for the approved project has been previously produced in the Archaeological Research Design (Artefact Heritage 2016, chapter 12). The following methodology section includes relevant sections of those archaeological methodologies for managing archaeological resources for the Central Walk.

### 7.2 Heritage induction

Archaeological heritage would be included in the general project induction for all personnel. At a minimum, this would include an overview of the projects obligations and archaeological management zones, the role of the archaeological team and the unexpected finds procedure.

### 7.3 Archaeological investigation

Archaeological investigation refers to active archaeological involvement in the construction program. It is undertaken to manage and mitigate archaeological impacts. It refers to:

- Monitoring and recording
- Test excavation
- Test/Salvage excavation
- Salvage excavation.

Each construction site has specific, or a combination of, archaeological investigation methods appropriate to the level of impacts and construction methodology.

### 7.4 Excavation director

Archaeological investigations would be managed by a suitably qualified Excavation Director with experience in the historical archaeology of Sydney and identification of human remains. The Excavation Director should meet the NSW Heritage Division criteria for State significant archaeological sites.

### 7.5 Work Stage-Specific Archaeological Method Statements

The detailed construction methodology for the approved project, and for the project as modified, will be determined by the construction contractor engaged for the works. As such, a Work Stage Specific Archaeological Method Statement (AMS) would be produced to clarify archaeological management requirements once the detailed construction methodology is known. The AMS would be prepared for prior to construction works with potential to impact archaeological resources. Staged construction programs may require more than one AMS to be prepared for each site. An AMS would generally include all archaeological management requirements including Aboriginal archaeology and its relationship to historical archaeology.

In regard to historical archaeology the AMS preparation would include the following:

- Review available basement and geotechnical data, and existing services surveys if required
- Review detailed design, scope of works, construction program and methodology
- Reassessment of potential for impacts to significant archaeological resources based on construction methodology and program
- Review of contamination reports and archaeological mitigation requirements during any remediation program
- Identify opportunity for in situ conservation of archaeological remains, such as altering construction methodology to avoid impacts, where possible
- Confirm appropriate archaeological investigation methodology to mitigate various impacts
- Provide additional archaeological research questions if required
- Provide environmental sampling and sieving strategies where appropriate
- Provide details of Aboriginal archaeological investigation if required at a particular construction site.

## 7.6 Salvage excavation

Archaeological salvage generally refers to open-area archaeological excavation under the control of the Excavation Director. Salvage includes the archaeological excavation of the entire historical archaeological site. It is undertaken following demolition and prior to bulk excavation.

It involves removal of modern fills and disturbance to the top of archaeological layers by machine under archaeological supervision. The archaeological remains are then cleaned by hand, investigated (excavated) and recorded in detail by the archaeological team. In urban archaeological sites, careful machine excavation may also be employed to assist the detailed archaeological excavation process.

Salvage excavation would be undertaken prior to construction impacts for the eastern entry, following demolition of the existing former MGM building. This area has been identified as an area of moderate to high potential for archaeological remains of local significance. Construction works would not proceed until the salvage excavation is completed and the Excavation Director has provided clearance.

## 7.7 Monitoring

Archaeological monitoring is where an archaeologist is in attendance and supervising construction excavation work with potential to expose or impact archaeological remains. Monitoring is generally undertaken where there is low or low-moderate potential for significant archaeological remains and/or where minor excavation work is in an area of archaeological sensitivity.

If archaeological remains are identified during archaeological monitoring, they would be recorded and assessed to determine if further investigation is required. Localised stoppages in the construction work would be required to facilitate this process. Works would not recommence until the monitoring archaeologist has completed the recording and is satisfied that further investigation is not required.

If significant archaeological remains are identified, then further investigation such as archaeological testing or salvage would be required prior to construction impacts.



## 7.8 Archaeological recording

The archaeological archival recording would be undertaken in accordance with best practice and NSW Heritage Division guidelines. The level of recording detail would be in accordance with the significance of the archaeological remains. The recording methodology includes the following:

- Significant archaeological structural remains, deposits and features would be recorded on context sheets
- A photographic record of the archaeological works and details of significant archaeological remains made
- Detailed survey and/or measured drawings would be prepared and include location of remains within the overall site
- Significant artefacts would be collected by context for later analysis
- Building material, soil and pollen samples would be collected for further analysis (as appropriate)
- Registers of contexts, photos, samples and drawings would be kept.

## 7.9 Underfloor deposits

Underfloor deposits may be present within the former MGM building. Underfloor deposits may provide particularly useful archaeological information in the context of domestic or industrial / manufacturing spaces.

Intact underfloor deposits would be excavated in a grid system, either 50 centimetre or 1 metre depending on extent of deposit. Excavation would be by context if stratigraphic layers are identifiable. If the deposit is homogenised excavation would proceed in 5 or 10 centimetre spits. Excavated material would be wet or dry sieved.

The range and percentage of archaeological material collected would be in accordance with a sieving strategy developed by the Excavation Director.

## 7.10 Artefacts

Artefacts are likely to be uncovered during archaeological investigations. Artefacts from secure or in situ contexts would be collected and recorded (by context). Retrieval of artefacts should focus on diagnostic pieces and other items whose analysis would contribute to the research questions for this site are retained.

Should diagnostic or significant artefacts be present within the fill layers (out-of-context), a sample would be retained as part of the archaeological record.

Retained artefacts would be cleaned processed, catalogued and analysed by an archaeologist experienced in historical artefact assemblages. Artefact analysis would include production of a database in accordance with best practice archaeological data recording. The resulting information would be included in the final excavation report.

Artefacts recovered from the archaeological investigations would be the property of Transport for NSW and would be securely stored by them following completion of post-excavation analysis.

## 7.11 Unexpected Finds Procedure

Unexpected archaeological finds would be managed under the Sydney Metro Unexpected Heritage Finds Procedure. The procedure is included in Appendix A. Unexpected finds would also apply to the identification of intact sand deposits during excavation works.

## 7.12 Exhumation Management Plan

If human skeletal remains are found during the project, works would cease immediately in that area. The NSW Coroner's Office and the NSW Police would be notified. A forensic anthropologist would be consulted to determine the nature of the remains.

Certain construction works for Central Station are within the former Devonshire Street Cemetery. Though exhumed in the early 1900s there is some potential for skeletal remains. If human skeletal remains are identified any archaeological investigation would be undertaken in accordance with the Skeletal Remains: Guidelines for Management of Human Skeletal Remains (Heritage Council of NSW, 1998).

Human remains would be managed under the Exhumation Management Plan produced as per the Conditions of Approval for the approved project. The policy has been included as Appendix B.

## 7.13 Preliminary results reporting

Interim or preliminary archaeological findings reports would be prepared following completion of archaeological investigation stages. This report would outline the main archaeological findings, post-excavation and analysis requirements, and could also include any further archaeological investigation requirements for a particular site or future construction task.

## 7.14 Post-excavation analysis and final report

Following the completion of on-site archaeological works, post-excavation analysis of the findings would be undertaken. The document would be issued as a single report incorporating the findings of the project as modified. This would include artefact analysis, environmental and building material sample analysis, stratigraphic reporting and production of Harris Matrices, production of illustrations and detailed site plans interpretation of site plans and illustrations final excavation report detailing the archaeological program and results would be prepared. It would include photographs and plans, catalogue and analysis of artefacts, and also respond to the research questions. The report would also include a reassessment of archaeological significance based on the investigation results. The report would be prepared in accordance with the standard conditions of archaeological permits issued under the Heritage Act.

## APPENDIX A: UNEXPECTED FINDS PROCEDURE



# Sydney Metro Unexpected Heritage Finds Procedure

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Supporting Document – Applicable to:

Quality Management System

Status:

Division:

Version:

Date of issue:

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Document owner:

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## 1. Purpose

This procedure has been developed in response to Critical State Significant Infrastructure (CSSI) Condition of Approval (CoA) E19 that requires Sydney Metro City & Southwest Program to provide a method for managing unexpected heritage items (both Aboriginal and non-Aboriginal) that are discovered during construction.. An 'unexpected heritage find' can be defined as any unanticipated archaeological discovery, that has not been previously assessed or is not covered by an existing approval under the *Heritage Act 1977* (Heritage Act) or *National Parks and Wildlife Act 1974* (NPW Act).

In NSW, there are strict laws to protect and manage heritage objects and relics. As a result, appropriate heritage management measures need to be implemented to minimise impacts on heritage values; ensure compliance with relevant heritage notification and other obligations; and to minimise the risk of penalties to individuals, TfNSW and its contractors. This procedure includes TfNSW's heritage notification obligations under the Heritage Act, NPW Act and the Coroner's Act 2009 and the specific requirements of the conditions of approval(CoA) issued by NSW Department of Planning and Environment for CSSI 15-7400.

Note that a Contractor may create their own Unexpected Finds Procedure or modify this document, however its use will be subject to compliance with the following:-

- CSSI CoA E17 requires consultation with the Heritage Council of NSW (or its delegate)
- CSSI CoA E19
- Prior approval from the nominated Excavation Director, as required under CSSI CoA E18
- Prior approval from the Environmental Representative (CSSI Condition of Approval A24
- Prior approval from Sydney Metro.

### Legislation that does not apply

The following authorisations are not required for Sydney Metro approved Critical State significant infrastructure (and accordingly the provisions of any Act that prohibit an activity without such an authority do not apply):

- Division 8 of Part 6 of the *Heritage Act 1977* does not apply to prevent or interfere with the carrying out of approved State significant infrastructure.
- An approval under Part 4, or an excavation permit under section 139, of the Heritage Act 1977,



- An Aboriginal heritage impact permit under section 90 of the National Parks and Wildlife Act 1974,

This document provides relevant background information in Section 3, followed by the technical procedure in Sections 6 and 7. Associated guidance referred to in the procedure can be found in Appendices A-H.

## 2. Scope

Despite appropriate and adequate investigation, unexpected heritage items may still be discovered during maintenance and construction works on a Sydney Metro site. When this happens, this procedure must be followed. This procedure provides direction on when to stop work, where to seek technical advice and how to notify the regulator, if required.

**This procedure applies to construction activities for the Sydney Metro Program as approved under Section 115ZB of the Environmental Planning and Assessment Act 1979 for Critical State Significant Infrastructure, Application No. SSI 15-7400.**

This procedure **applies to**:

- the discovery of any unexpected heritage item, relic or object, where the find is not anticipated in the Archaeological Assessment Design Report (AARD)

This procedure must be followed by all Sydney Metro staff, contractors, subcontractors or any person undertaking works for Sydney Metro. It includes references to some of the relevant legislative and regulatory requirements, but is not intended to replace them with the exception S139 of the NSW Heritage Act 1977

This procedure **does not apply to**:

- The discovery and disturbance of heritage items as a result of investigations being undertaken in accordance with the Office of Environment and Heritage's (OEH) *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW 2010*<sup>1</sup>; an Aboriginal Heritage Impact Permit (AHIP) issued under the NPW Act; or an approval issued under the Heritage Act.
- the discovery and disturbance of heritage items as a result of construction related activities, where the disturbance is permissible in accordance with an AHIP; or an approval issued under the Heritage Act; All new Construction Environment

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<sup>1</sup> An act carried out in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* as published by the Department in the Gazette on 24 September 2010 is excluded from the definition of **harm** an object or place in section 5 (1) of the NPW Act.

Management Plans (CEMPs) must make reference to and/or include this procedure (included as a heritage sub-plan, refer to CSSI CoA C6(g)).

Note that this procedure does not supersede the requirements of CSSI CoA CSSI CoA E10 and E26:

- E10 The Proponent must not destroy, modify or otherwise physically affect any Heritage item not identified in documents referred to in CoA A 1.
- E26 This approval does not allow the Proponent to harm, modify, or otherwise impact human remains uncovered during the construction and operation of the CSSI, except in accordance with the Exhumation Management Plan (CoA E27).

### 3. Definitions

All terminology in this procedure is taken to mean the generally accepted or dictionary definition with the exception of the following terms which have a specifically defined meaning:

Term	Meaning
<b>AHIP</b>	Aboriginal Heritage Impact Permit
<b>Aboriginal object</b>	An Aboriginal object is any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains. An Aboriginal object may include a shell midden, stone tools, bones, rock art, Aboriginal-built fences and stockyards, scarred trees and the remains of fringe camps.
<b>CEMP</b>	Construction Environmental Management Plan
<b>CoA</b>	Conditions of Approval
<b>CSSI</b>	Critical State Significant Infrastructure
<b>EP&amp;A Act</b>	NSW <i>Environmental Planning and Assessment Act 1979</i>
<b>Heritage Act</b>	NSW <i>Heritage Act 1977</i>
<b>NPW Act</b>	NSW <i>National Parks and Wildlife Act 1974</i>
<b>OEH</b>	Office of Environment and Heritage

Term	Meaning
<b>Relic (non-Aboriginal heritage)</b>	<p>A relic means any deposit, artefact, object or material evidence that:</p> <ul style="list-style-type: none"> <li>a) relates to the settlement of the area that comprises NSW, not being Aboriginal settlement, and</li> <li>b) is of State or local heritage significance.</li> </ul> <p>A relic may include items such as bottles, utensils, remnants of clothing, crockery, personal effects, tools, machinery and domestic or industrial refuse.</p>
<b>TfNSW</b>	Transport for New South Wales – Infrastructure and Services Division
<b>Work (non-Aboriginal heritage)</b>	<p>Archaeological features such as historic utilities or buried infrastructure that provide evidence of prior occupations such as former rail or tram tracks, timber sleepers, kerbing, historic road pavement, fences, culverts, historic pavement, buried retaining walls, cisterns, conduits, sheds or building foundations, but are subject to specific assessment by the Excavation Director</p>

## 4. Accountabilities

The Principal Manager Sustainability Environment & Planning (Program) is accountable for this procedure including authorising the document, monitoring its effectiveness and performing a formal document review.

## 5. Types of unexpected heritage items and corresponding statutory protections

The roles of project, field and environmental personnel (including construction contractors) are critical to the early identification and protection of unexpected heritage items. **Appendix A** illustrates the wide range of heritage discoveries found on transport infrastructure projects and provides a useful photographic guide. Subsequent to confirmation of a heritage discovery it must then be identified and assessed by Excavation Director as required under CSSI CoA E20. An 'unexpected heritage item' means any unanticipated discovery of an actual or potential heritage item, for which Sydney Metro (refer to CSSI CoA E10 and E26) does not have approval to disturb<sup>2</sup> and/or have an existing management process in place.

These discoveries are categorised as either:

<sup>2</sup> Disturbance is considered to be any physical interference with the item that results in it being destroyed, defaced, damaged, harmed, impacted or altered in any way (this includes archaeological investigation activities).



- (a) Aboriginal objects
- (b) historic (non-Aboriginal) heritage items
- (c) human skeletal remains.

The relevant legislation that applies to each of these categories is described below and is also addressed in the Sydney Metro Exhumation Management Plan (refer to CSSI CoA E26 and E27).

## **5.1. Aboriginal objects**

The NPW Act protects Aboriginal objects which are defined as:

*“any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non Aboriginal extraction, and includes Aboriginal remains”<sup>3</sup>.*

Examples of Aboriginal objects include stone tool artefacts, shell middens, axe grinding grooves, pigment or engraved rock art, burials and scarred trees.

### **IMPORTANT!**

**All Aboriginal objects, regardless of significance, are protected under law.**

If any impact is expected to an Aboriginal object, an AHIP is usually required from OEH<sup>4</sup>. Also, when a person becomes aware of an Aboriginal object they must notify the Director-General of OEH about its location<sup>5</sup>. Assistance on how to do this is provided in Section 7 (Step 5).

CSSI CoA E23, E24 and E25 for management of Aboriginal Heritage Applies to the Sydney Metro Chatswood to Sydenham Project

## **5.2. Historic heritage items**

Historic (non-Aboriginal) heritage items may include:

- archaeological ‘relics’
- other historic items (i.e. works, structures, buildings or movable objects).

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<sup>3</sup> Section 5(1) NPW Act.

<sup>4</sup> Refer to CSSI CoA E23 & E25.

<sup>5</sup> This is required under section 89(A) of the NPW Act and applies to all TfNSW projects.

### 5.2.1. Archaeological relics

The Heritage Act protects *relics* which are defined as:

*“any deposit, artefact, object or material evidence that relates to the settlement of the area that comprises NSW, not being Aboriginal settlement; and is of State or local heritage significance”<sup>6</sup>.*

Relics are archaeological items of local or state significance which may relate to past domestic, industrial or agricultural activities in NSW, and can include bottles, remnants of clothing, pottery, building materials and general refuse.

#### **IMPORTANT!**

**All relics are subject to statutory controls and protections.**

If a relic is likely to be disturbed, a heritage approval is usually required from the NSW Heritage Council<sup>7</sup>. Also, when a person discovers a relic they must notify the NSW Heritage Council of its location<sup>8</sup>. Advice on how to do this is provided in Section 7 (Step 5). Check

Construction in the vicinity of the discovery must not recommence until the requirements of the ARMP have been implemented, in consultation with the Excavation Director. The Sydney Metro must notify the Secretary of the Department of Environment & Planning in writing of the outcome of consultation with the Heritage Council of NSW. (CSSI CoA E20)

### 5.2.2. Other historic items

Some historic heritage items are not considered to be ‘relics’; but are instead referred to as works, buildings, structures or movable objects. Examples of these items that may be encountered include culverts, historic pavements, retaining walls, tramlines, rail tracks, timber sleepers, cisterns, fences, sheds, buildings and conduits. Although an approval under the Heritage Act may not be required to disturb these items, their discovery must be managed in accordance with this procedure.

As a general rule, an archaeological relic requires discovery or examination through the act of excavation. An archaeological excavation permit under section 140 of the Heritage Act is required to do this. In contrast, ‘other historic items’ either exist above the ground surface

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<sup>6</sup> Section 4(1) Heritage Act.

<sup>7</sup> Refer to CSSI CoA E20,

<sup>8</sup> This is required under section 146 of the Heritage Act and applies to all TfNSW projects however also refer to foot note 8.

(e.g. a shed), or they are designed to operate and exist beneath the ground surface (e.g. a culvert).

Despite this difference, it should be remembered that relics can often be associated with 'other heritage items', such as archaeological deposits within cisterns and underfloor deposits beneath buildings.

### **5.3. Human skeletal remains**

Refer to Sydney Metro Project Exhumation Management Plan

Human skeletal remains can be identified as either an Aboriginal object or non-Aboriginal relic depending on ancestry of the individual (Aboriginal or non-Aboriginal) and burial context (archaeological or non-archaeological). Remains are considered to be archaeological when the time elapsed since death is suspected of being 100 years or more. Depending on ancestry and context, different legislation applies.

As a simple example, a pre-European settlement archaeological Aboriginal burial would be protected under the NPW Act, while a historic (non-Aboriginal) archaeological burial within a cemetery would be protected under the Heritage Act. For a non-Aboriginal archaeological burial, the relevant heritage approval and notification requirement described in Section 3.1 would apply. In addition to the NPW Act, finding Aboriginal human remains also triggers notification requirements to the Commonwealth Minister for the Environment under section 20(1) of the Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Commonwealth).

#### **IMPORTANT!**

**All human skeletal remains are subject to statutory controls and protections.**

All bones must be treated as potential human skeletal remains and work around them must stop while they are protected and investigated urgently.

However, where it is suspected that less than 100 years has elapsed since death, the human skeletal remains come under the jurisdiction of the State Coroner and the *Coroners Act 2009* (NSW). Such a case would be considered a 'reportable death' and under legal notification obligations set out in section 35(2); a person must report the death to a police officer, a coroner or an assistant coroner as soon as possible. This applies to all human remains less than 100 years old<sup>9</sup> regardless of ancestry (i.e. both Aboriginal and non-Aboriginal remains). Public health controls may also apply.

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<sup>9</sup> Under section 19 of the *Coroners Act 2009*, the coroner has no jurisdiction to conduct an inquest into reportable death unless it appears to the coroner that (or that there is reasonable cause to suspect that) the death or suspected death occurred within the last 100 years.



Guidance on what to do when suspected human remains are found is provided in **Appendix E**.

## 6. Legislative Requirements

Table 1 identifies some of the relevant legislation/regulations for the protection of heritage and the management of unexpected heritage finds in NSW. It should be noted that significant penalties exist for breaches of the listed legislation as a result of actions that relate to unauthorised impacts on heritage items. Further, it is noted that heritage that has been assessed and is being managed in accordance with relevant statutory approvals(s) is exempt from these offences.

To avoid breaches of legislation, it is important that Sydney Metro and its contractors are aware of their statutory obligations under relevant legislation and that appropriate control measures are in place to ensure that unexpected heritage items are appropriately managed during construction. Contractors/Alliances will need to ensure that they undertake their own due diligence to identify any other legislative requirements that may apply for a given project.

**Table 1 Legislation and guidelines for management of unexpected heritage finds**

Relevant Requirement	Objectives and offences
<b><i>Environmental Planning and Assessment Act 1979 (EP&amp;A Act)</i></b>	Section 115ZB Giving of approval by Minister to carry out a project
<b><i>Environmental Planning and Assessment Act 1979 (EP&amp;A Act)</i></b>	Requires heritage to be considered within the environmental impact assessment of projects.  This guideline is based on the premise that an appropriate level of Aboriginal and non-Aboriginal cultural heritage assessment and investigations and mitigation have already been undertaken under the relevant legislation, including the EP&A Act, during the assessment and determination process. It also assumes that appropriate mitigation measures have been included in the conditions of any approval.

Relevant Requirement	Objectives and offences
<b>Heritage Act 1977 (Heritage Act)</b>	<p>The Heritage Act provides for the care, protection and management of heritage items in NSW.</p> <p>Under section 139, it is an offence to disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed, unless the disturbance or excavation is carried out in accordance with an excavation permit issued by the Heritage Division of the OEH.</p> <p>Under the Act, a relic is defined as: <i>'any deposit, artefact, object or material evidence that: (a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and (b) is of State or local heritage significance.'</i></p> <p>A person must notify the Heritage Division of OEH, if a person is aware or believes that they have discovered or located a relic (section 146). Penalties for offences under the Heritage Act can include six months imprisonment and/or a fine of up to \$1.1million.</p>
<b>National Parks and Wildlife Act 1974 (NPW Act)</b>	<p>The NPW Act provides the basis for the care, protection and management of Aboriginal objects and places in NSW.</p> <p>An Aboriginal object is defined as: <i>'any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains'.</i></p> <p>An 'Aboriginal place' is an area declared by the Minister administering the Act to be of special significance with respect to Aboriginal culture. An Aboriginal place does not have to contain physical evidence of occupation (such as Aboriginal objects).</p> <p>Under section 87 of the Act, it is an offence to harm or desecrate an Aboriginal object or place. There are strict liability offences. An offence cannot be upheld where the harm or desecration was authorised by an AHIP and the permit's conditions were not contravened. Defences and exemptions to the offence of harming an Aboriginal object or Aboriginal place are provided in section 87, 87A and 87B of the Act.</p> <p>A person must notify OEH if a person is aware of the location of an Aboriginal object.</p> <p>Penalties for some of the offences can include two years imprisonment and/or up to \$550,000 (for individuals), and a maximum penalty of \$1.1 million (for corporations).</p>

## **7. Unexpected heritage finds protocol**

### **7.1. What is an unexpected heritage find?**

An 'unexpected heritage find' can be defined as any unanticipated archaeological discovery that has not been identified during a previous assessment or is not covered by an existing permit under the Heritage Act. The find may have potential cultural heritage value, which may require some type of statutory cultural heritage permit or notification if any interference of the heritage item is proposed or anticipated.

The range of potential archaeological discoveries can include but are not limited to:

- remains of rail infrastructure including buildings, footings, stations, signal boxes, rail lines, bridges and culverts
- remains of other infrastructure including sandstone or brick buildings, wells, cisterns, drainage services, conduits, old kerbing and pavement, former road surfaces, timber and stone culverts, bridge footings and retaining walls
- artefact scatters including clustering of broken and complete bottles, glass, ceramics, animal bones and clay pipes
- Archaeological human skeletal remains.

### **7.2. Managing unexpected heritage finds**

In the event that an unexpected heritage find (the find) is encountered on a Sydney Metro site, the flowchart in Figure 1 must be followed. There are eight steps in the procedure. These steps are summarised in Figure 1 and explained in detail in Table 2

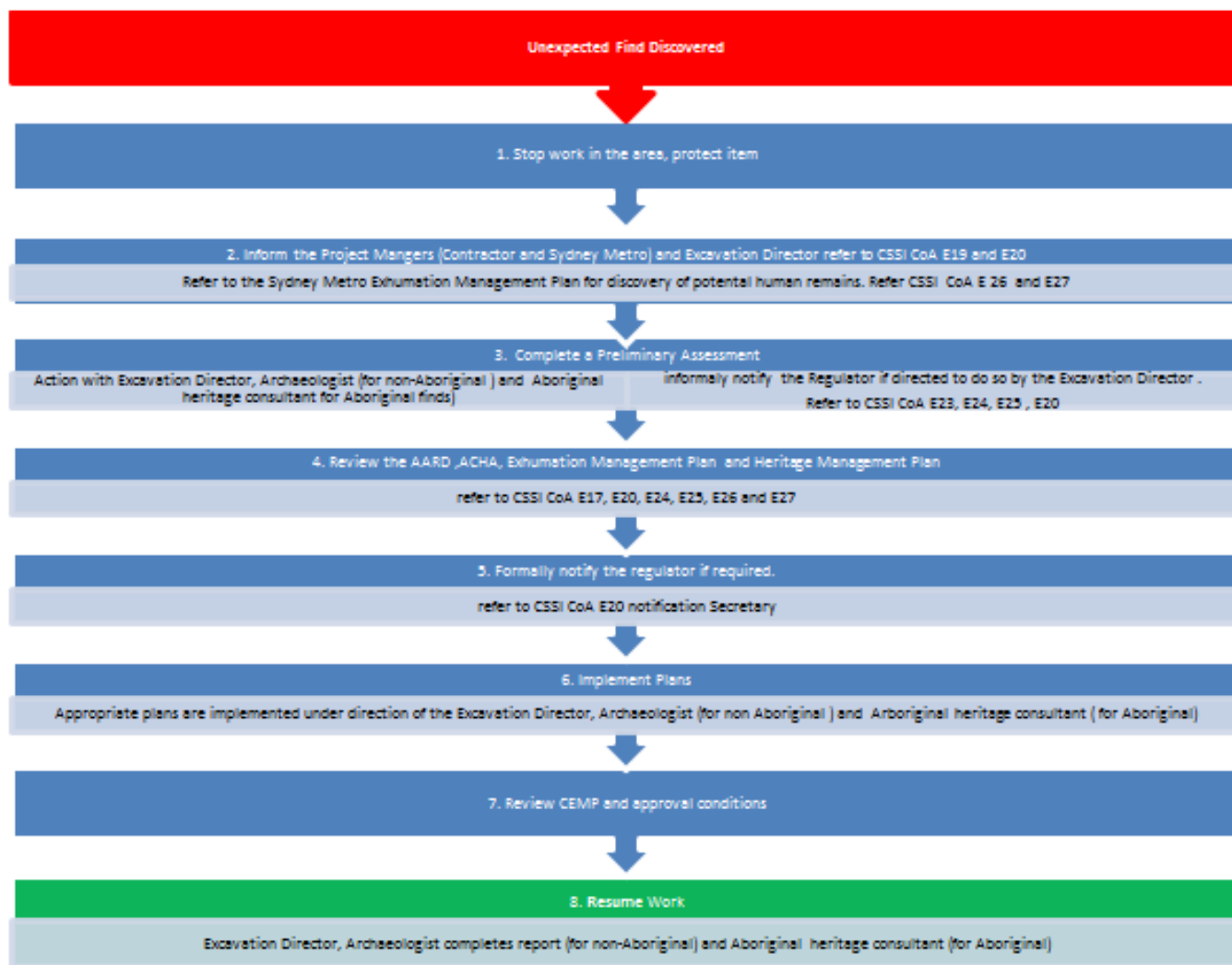
**Figure 1 Overview of steps to be undertaken on the discovery of an unexpected heritage item**

#### **IMPORTANT!**

Sydney Metro may have approval to impact on certain heritage items during construction. If you discover a heritage item and you are unsure whether an approval is in place or not, **STOP** works and follow this procedure.



## Sydney Metro Unexpected Heritage Finds Procedure



**Table 2 Specific tasks to be implemented following the discovery of an unexpected heritage item**

Step	Task	Responsibility	Guidance and tools
<b>1</b>	<b>Stop work, protect item and inform the Excavation Director</b>		
1.1	Stop all work in the immediate area of the item and notify the Project Manager	Contractor/ Supervisor	<b>Appendix A</b> (Identifying Unexpected Heritage items)
1.2	Establish a 'no-go zone' around the item. Use high visibility fencing, where practical. No work is to be undertaken within this zone until further investigations are completed and, if required, appropriate approvals are obtained. Inform all site personnel about the no-go zone.	Project Manager/ Contractor/ Supervisor	
1.3	Inspect, document and photograph the item.	Excavation Director	<b>Appendix B</b> (Unexpected Heritage Item Recording Form) <b>Appendix C</b> (Photographing Unexpected Heritage items)
1.4	Is the item likely to be bone? If <b>yes</b> , follow the steps in Appendix D – 'Uncovering bones'. Where it is obvious that the bones are human remains, you must notify the local police by telephone immediately. They may take command of all or part of the site. If <b>no</b> , proceed to next step.	Excavation Director	<b>Appendix D</b> (Uncovering Bones)

Step	Task	Responsibility	Guidance and tools
1.5	Inform the Excavation Director of the item and provide as much information as possible, including photos and completed form ( <b>Appendix B</b> ). Where the project has an Environmental Management Representative (EMR), the EMR should be involved in the tasks/process as appropriate.	Contractors Project Manager	
1.6	Can the works avoid further disturbance to the item? Project Manager to confirm with TfNSW Environment and Planning Manager. Complete the remaining tasks in Step 1.	Contractors Project Manager	
1.7	Excavation Director to advise the Project Manager whether TfNSW has approval to impact on the 'item'. Does Metro have an approval or permit to impact on the item? If <b>yes</b> , work may recommence in accordance with that approval or permit. There is no further requirement to follow this procedure. If <b>no</b> , continue to next step.	Contractors Project Manager	
1.8	Has the 'find' been damaged or harmed? If <b>yes</b> , record the incident in the Incident Management System Implement any additional reporting requirements related to the planning approval and CEMP, where relevant. Contact Sydney Metro Manager, Environment Safety, Environment and Business Systems	Contractors Project Manager, Excavation Director	
<b>2</b>	<b>Contact and engage an archaeologist and/or an Aboriginal heritage consultant</b>		



Step	Task	Responsibility	Guidance and tools
2.1	<p>If an archaeologist and/or Aboriginal heritage consultant has been previously appointed for the project, contact them to discuss the location and extent of the item and arrange a site inspection, if required. The project CEMP may contain contact details of the archaeologist/Aboriginal heritage consultant.</p> <p>Where there is no project archaeologist engaged for the works engage a suitably qualified consultant to assess the find:</p> <p>if the find is a non-Aboriginal deposit, engage a suitably qualified and experienced archaeological consultant</p> <p>if the find is likely to be an Aboriginal object, engage an Aboriginal heritage consultant to assess the find.</p>	Contractors Project Manager, Excavation Director	
2.2	If requested, provide photographs of the item taken during Step 1.3 to the archaeologist or Aboriginal heritage consultant.	TfNSW Project Manager	<b>Appendix C</b> (Photographing Unexpected Heritage items)
<b>3</b>	<b>Preliminary assessment and recording of the find</b>		
3.1	In a minority of cases, the archaeologist/Aboriginal heritage consultant may determine from the photographs that no site inspection is required because no heritage constraint exists for the project ( <i>e.g. the item is not a 'relic', a 'heritage item' or an 'Aboriginal object'</i> ). Any such advice should be provided in writing ( <i>e.g. via email or letter with the consultant's name and company details clearly identifiable</i> ) to the TfNSW Project Manager.	Archaeologist/ Aboriginal heritage consultant/ Contractors Project Manager, Excavation Director	Proceed to Step 8

Step	Task	Responsibility	Guidance and tools
3.2	Arrange site access for the archaeologist/Aboriginal heritage consultant to inspect the item as soon as practicable. In the majority of cases a site inspection is required to conduct a preliminary assessment.	Contractors Project Manager, Excavation Director	
3.3	Subject to the archaeologist/Aboriginal heritage consultant's assessment, work may recommence at a set distance from the item. This is to protect any other archaeological material that may exist in the vicinity, which may have not yet been uncovered. Existing protective fencing established in Step 1.2 may need to be adjusted to reflect the extent of the newly assessed protective area. No works are to take place within this area once established.	Archaeologist/ Aboriginal heritage consultant Contractors Project Manager, Excavation Director	
3.4	<p>The archaeologist/Aboriginal heritage consultant may provide advice after the site inspection and preliminary assessment that no heritage constraint exists for the project (e.g. the item is not a '<i>relic</i>' or a '<i>heritage item</i>' or an '<i>aboriginal item</i>'. Any such advice should be provided in writing (e.g. via email or letter with the consultant's name and company details clearly identifiable) to the Metro Project Manager.</p> <p>Note that :</p> <ul style="list-style-type: none"> <li>a relic is evidence of past human activity which has local or State heritage significance. It may include items such as bottles, utensils, remnants of clothing, crockery, personal effects, tools, machinery and domestic or industrial refuse</li> <li>an Aboriginal object may include a shell midden, stone tools, bones, rock art or a scarred tree</li> <li>a "work", building or standing structure may include tram or train tracks, kerbing, historic road pavement, fences, sheds or building foundations.</li> </ul>	Archaeologist/ Aboriginal heritage consultant/ Contractors Project Manager, Excavation Director	Proceed to Step 8 Refer to <b>Appendix A</b> (Identifying heritage items)

Step	Task	Responsibility	Guidance and tools
3.5	Where required, seek additional specialist technical advice (such as a forensic or physical anthropologist to identify skeletal remains). The archaeologist/Aboriginal heritage consultant can provide contacts for such specialist consultants.	Contractors Project Manager, Excavation Director	
3.6	Where the item has been identified as a 'relic' or 'heritage item' or an 'Aboriginal object' the archaeologist should formally record the item.	Archaeologist/ Aboriginal heritage consultant	
3.7	OEH (Heritage Division for non-Aboriginal relics and Planning and Aboriginal Heritage Section for Aboriginal objects) can be notified informally by telephone at this stage by the Sydney Metro Principal Manager Sustainability Environment and Planning (Program). Any verbal conversations with regulators must be noted on the project file for future reference.	Contractors Project Manager, Excavation Director	
<b>4</b>	<b>Section 4 not used</b>		



Step	Task	Responsibility	Guidance and tools
<b>5</b>	<b>Notify the regulator, if required.</b>		
5.1	Based on the findings of the archaeological or heritage management plan and corresponding legislative requirements, is the find required to be notified to OEH and the Secretary? If <b>no</b> , proceed directly to Step 6 If <b>yes</b> , proceed to next step.	Contractors Project Manager, Excavation Director	
5.2	If notification is required, complete the template notification letter, including the archaeological/heritage management plan and other relevant supporting information and forward to the Sydney Metro Principal Manager Sustainability Environment and Planning (Program) for signature.	Contractors Project Manager, Excavation Director	<b>Appendix F</b> (Template Notification Letter)
5.3	Forward the signed notification letter to OEH and the Secretary. Informal notification (via a phone call or email) to OEH prior to sending the letter is appropriate. The archaeological or heritage management plan and the completed site recording form (Appendix B) must be submitted with the notification letter (for both Aboriginal objects and non-Aboriginal relics). For Part 5.1 projects, the Department of Planning and Environment must also be notified.	Contractors Project Manager, Excavation Director	
5.4	A copy of the final signed notification letter, archaeological or heritage management plan and the site recording form is to be kept on file and a copy sent to the Sydney Metro Project Manager.	Contractors Project Manager, Excavation Director	
<b>6</b>	<b>Implement archaeological or heritage management plan</b>		

Step	Task	Responsibility	Guidance and tools
6.1	Modify the archaeological or heritage management plan to take into account any additional advice resulting from notification and discussions with OEH.	Contractors Project Manager, Excavation Director	
6.2	Implement the archaeological or heritage management plan. Where impact is expected, this may include a formal assessment of significance and heritage impact assessment, preparation of excavation or recording methodologies, consultation with Registered Aboriginal Parties, obtaining heritage approvals etc., if required.	Contractors Project Manager, Excavation Director	
6.3	Where heritage approval is required contact the Environment and Planning Manager for further advice and support material. Please note there are time constraints associated with heritage approval preparation and processing.	Contractors Project Manager, Excavation Director	
6.4	Assess whether heritage impact is consistent with the project approval or if project approval modification is required from the Department of Planning and Environment.	Contractors Project Manager, Excavation Director	
6.5	Where statutory approvals (or project approval modification) are required, impact upon relics and/or Aboriginal objects must not occur until heritage approvals are issued by the appropriate regulator.	Contractors Project Manager, Excavation Director	
6.6	Where statutory approval is not required but where recording is recommended by the archaeologist/Aboriginal heritage consultant, sufficient time must be allowed for this to occur.	Contractors Project Manager, Excavation Director	

Step	Task	Responsibility	Guidance and tools
6.7	Ensure short term and permanent storage locations are identified for archaeological material or other heritage material removed from site, where required. Interested third parties (e.g. museums, local Aboriginal land councils, or local councils) should be consulted on this issue. Contact the archaeologist or Aboriginal heritage consultant for advice on this matter, if required.	Contractors Project Manager, Excavation Director	
<b>7</b>	<b>Section 7 Not Used</b>		
<b>8</b>	<b>Resume work</b>		
8.1	Seek written clearance to resume project work from the Environment and Planning Manager and the Archaeologist/Aboriginal heritage consultant. Clearance would only be given once all archaeological excavation and/or heritage recommendations and approvals (where required) are complete. Resumption of project work must be in accordance with the all relevant project/heritage approvals/determinations.	Contractors Project Manager, Excavation Director	
8.2	If required, ensure archaeological excavation/heritage reporting and other heritage approval conditions are completed in the required timeframes. This includes artefact retention repositories, conservation and/or disposal strategies.	Contractors Project Manager, Excavation Director	
8.3	Deleted		
8.4	If additional unexpected items are discovered this procedure must begin again from Step 1.	All	



## 8. Responsibilities

### Roles and Responsibilities

Role	Responsibility or role under this guideline
<b>Contractor / Supervisor</b>	Stop work immediately when an unexpected heritage find is encountered. Cordon off area until Environmental Manager advises that work can recommence.
<b>Contractor or Environment Manager</b>	<p>Manage the process of identifying, protecting and mitigating impacts on the 'find'.</p> <p>Liaise with Sydney Metro Project Manager and Environment and Planning Manager and assist the archaeologist/Aboriginal heritage consultant with mitigation and regulatory requirements.</p> <p>Complete Incident Report and review CEMP for any changes required. Propose amendments to the CEMP if any changes are required.</p>
<b>Contractor's or Project Heritage Advisor or Consultant</b>	Provide expert advice to the Sydney Metro Environment and Planning Manager on 'find' identification, significance, mitigation, legislative procedures and regulatory requirements.
<b>Environmental Management Representative</b>	<p>Independent environmental advisor engaged by Sydney Metro</p> <p>Review and provides advice on heritage management plan and changes to the CEMP. Ensures compliance with relevant approvals (new and existing).</p>
<b>Heritage Division of OEH</b>	<p>Regulate the care, protection and management of relics (non-Aboriginal heritage).</p> <p>Delegated authority for Heritage Council</p> <p>Issue excavation permits.</p>
<b>Registered Aboriginal Parties (RAPs)</b>	Aboriginal people who have registered with Sydney Metro to be consulted about a proposed project or activity in accordance with the OEH <i>Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010</i> .
<b>Sydney Metro Environment and Planning Manager</b>	Notify the TfNSW Principal Manager, Environmental Management of 'find' and manage Incident Reporting once completed by Environmental Manager.
<b>Contractors Project Manager</b>	Ensures all aspects of this procedure are implemented. Advise Contractor / Supervisor to recommence work when all applicable requirements have been satisfied.

## 9. Seeking advice

Advice on this procedure should be sought from the Sydney Metro Environment and Planning Manager in the first instance. Contractors and alliance partners should ensure their own project environment managers are aware of and understand this procedure.

Technical archaeological or heritage advice regarding an unexpected heritage item should be sought from a suitably qualified and experienced archaeologist/Aboriginal heritage consultant.

## 10. Related documents and references

### Related Documents

Environmental Incident Classification and Reporting – 9TP-PR-105

Guide to Environmental Control Map – 3TP-SD-015

NSW Heritage Office (1998), *Skeletal remains: guidelines for the management of human skeletal remains*.

Roads and Maritime Services (2015), *Standard Management Procedure Unexpected Heritage Items*.

Department of Environment and Conservation NSW (2006), *Manual for the identification of Aboriginal remains*.

## 11. List of appendices

The following appendices are included to support this procedure:

- Appendix A: Examples of finds encountered during construction works
- Appendix B: Unexpected Heritage Item Recording Form
- Appendix C: Photographing Unexpected Heritage Items
- Appendix D: Uncovering Bones
- Appendix E: Archaeological Advice Checklist
- Appendix F: Template Notification Letter

## **Appendix A - Examples of finds encountered during construction works**



**Photo 1 - Aboriginal artefacts found at the Wickham Transport Interchange, 2015**





**Photo 2 – Aboriginal artefacts (shell material) found at the Wickham Transport Interchange, 2015**



**Photo 3 1840s seawall and 1880s retaining wall uncovered at Balmain East, 2016**





**Photo 4 Sandstone pavers uncovered at Balmain East, 2016**



**Photo 5 - Platform structure at Hamilton Railway Station classified as a 'work' by the project archaeologist - Wickham Transport Interchange project, 2015**

**Photo 6 - Platform structure at Hamilton Railway Station classified as a 'work' by the project archaeologist - Wickham Transport Interchange project, 2015**



**Photo 7 - Sandstone flagging and cesspit - Wynyard Walk project, 2014**





**Photo 8 - Chinese Ming Dynasty pottery and English porcelain/pottery dating back to early 19th century -Wynyard Walk project, 2014**



**Photo 9 - Pottery made by convict potter Thomas Ball during the early settlement - Wynyard Walk project, 2014**

The following images, obtained from the Roads and Maritime Services' *Standard Management Procedure for Unexpected Heritage items 2015*, can be used to assist in the preliminary identification of potential unexpected items during construction and maintenance works.



Photo 10 - Top left hand picture continuing clockwise: Stock camp remnants (Hume Highway Bypass at Tarcutta); Linear archaeological feature with post holes (Hume Highway Duplication), Animal bones (Hume Highway Bypass at

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Woomargama); Cut wooden stake; Glass jars, bottles, spoon and fork recovered from refuse pit associated with a Newcastle Hotel (Pacific Highway, Adamstown Heights, Newcastle area) (RMS, 2015).





**Photo 11 - Top left hand picture continuing clockwise: Stock camp remnants (Hume Highway Bypass at Tarcutta);  
Linear archaeological feature with post holes (Hume Highway Duplication), Animal bones (Hume Highway Bypass at**

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Woomargama); Cut wooden stake; Glass jars, bottles, spoon and fork recovered from refuse pit associated with a Newcastle Hotel (Pacific Highway, Adamstown Heights, Newcastle area) (RMS, 2015).

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## Appendix B- Unexpected heritage item recording form





**Example of unexpected heritage item recording form**

**This form is to be completed Excavation Director on the discovery of an archaeological heritage item during construction or maintenance works**

<b>Date:</b>		<b>Recorded by:</b> (include name and position)	
<b>Project name:</b>			
<b>Description of works being undertaken:</b>			
<b>Description of exact location of item</b>			
<b>Description of item found</b> (What type of item is it likely to be? Tick the relevant boxes).			
<b>A. A relic</b>	<input type="checkbox"/>	A 'relic' is evidence of a past human activity relating to the settlement of NSW with local or state heritage significance. A relic might include bottle, utensils, plates, cups, household items, tools, implements, and similar items	
<b>B. A 'work', building or structure'</b>	<input type="checkbox"/>	A 'work' can generally be defined as a form infrastructure such as track or rail tracks, timber sleepers, a culvert, road base, a bridge pier, kerbing, and similar items	
<b>C. An Aboriginal object</b>	<input type="checkbox"/>	An 'Aboriginal object' may include stone tools, stone flakes, shell middens, rock art, scarred trees and human bones	
<b>D. Bone</b>	<input type="checkbox"/>	Bones can either be human or animal remains. <b>Remember that you must contact the local police immediately by</b>	

		<b>telephone if you are certain that the bone(s) are human remains.</b>	
<b>E. Other</b>	<input type="checkbox"/>		
<b>Provide a short description of the item</b> <i>(eg metal rail tracks running parallel to the rail corridor. Good condition. Tracks set in concrete, approximately 10 cm below the current ground surface).</i>			
<b>Sketch</b> <i>(provide a sketch of the item's general location in relation to other road features so its approximate location can be mapped without having to re-excavate it. In addition, please include details of the location and direction of any photographs of the item taken)</i>			
<b>Action taken</b> (Tick either A or B)			
<b>A. Unexpected item would not be further impacts on by the works</b>	<input type="checkbox"/>	<b>Describe how works would avoid impact on the item.</b> <i>(eg the rail tracks would be left in situ and recovered with paving).</i>	



B. Unexpected item would be further impacted by the works	<input type="checkbox"/>	<b>Describe how works would impact on the item.</b> <i>(eg milling is required to be continued to a depth of 200 mm depth to ensure the pavement requirements are met. Rail tracks would need to be removed.)</i>	
Excavation Director		Signature	
		Signature	

**Important**

**It is a statutory offence to disturb Aboriginal objects and historic relics (including human remains) without an approval. All works affecting objects and relics must cease until an approval is sought.**

**Approvals may also be required to impact on certain works.**



## Appendix C- Photographing unexpected heritage items

Photographs of unexpected items in their current context (*in situ*) may assist archaeologists/Aboriginal heritage consultants to better identify the heritage values of the item. Emailing good quality photographs to specialists can allow for better quality and faster heritage advice. The key elements that must be captured in photographs of the item include its position, the item itself and any distinguishing features. All photographs must have a scale (ruler, scale bar, mobile phone, coin etc) and a note describing the direction of the photograph.

### Context and detailed photographs

It is important to take a general photograph (Figure 1) to convey the location and setting of the item. This will add value to the subsequent detailed photographs also required (Figure 2).

**Removal of the item from its context (e.g. excavating from the ground) for photographic purposes is not permitted.**



**Figure 2:** Close up detail of the sandstone surface showing material type, formation and construction detail. This is essential for establishing date of the feature.

**Figure 1:** Telford road uncovered on the Great Western Highway (Leura) in 2008 (RMS, 2015).

### Photographing distinguishing features

Where unexpected items have a distinguishing feature, close up detailed photographs must be taken of these features, where practicable. In the case of a building or bridge, this may include diagnostic details architectural or technical features. See Figures 3 and 4 for examples.





**Figure 3:** Ceramic bottle artefact with stamp.



**Figure 4:** Detail of the stamp allows 'Tooth & Co Limited' to be made out. This is helpful to a specialist in gauging the artefact's origin, manufacturing date and likely significance.

### Photographing bones

The majority of bones found on site will those of be recently deceased animal bones often requiring no further assessment (unless they are in archaeological context). However, if bones are human, the police must be contacted immediately (see Appendix F for detailed guidance). Taking quality photographs of the bones can often resolve this issue quickly. The project archaeologist can confirm if bones are human or non-human if provided with appropriate photographs.

Ensure that photographs of bones are not concealed by foliage (Figure 5) as this makes it difficult to identify. Minor hand removal of foliage can be undertaken as long as disturbance of the bone does not occur. Excavation of the ground to remove bone(s) should not occur, nor should they be pulled out of the ground if partially exposed.

Where sediment (adhering to a bone found on the ground surface) conceals portions of a bone (Figure 6) ensure the photograph is taken of the bone (if any) that is not concealed by sediment.



**Figure 5: Bone concealed by foliage.**



**Figure 6: Bone covered in sediment**

Ensure that all close up photographs include the whole bone and then specific details of the bone (especially the ends of long bones, the *epiphysis*, which is critical for species identification). Figures 7 and 8 are examples of good photographs of bones that can easily be identified from the photograph alone. They show sufficient detail of the complete bone and the epiphysis.



**Figure 7: Photograph showing complete bone.**



**Figure 8: Close up of a long bone's epiphysis.**





## Appendix D - Uncovering bones

This appendix provides advice regarding:

- what to do on first discovering bones
- the range of human skeletal notification pathways
- additional considerations and requirements when managing the discovery of human remains.

### 1. First uncovering bones

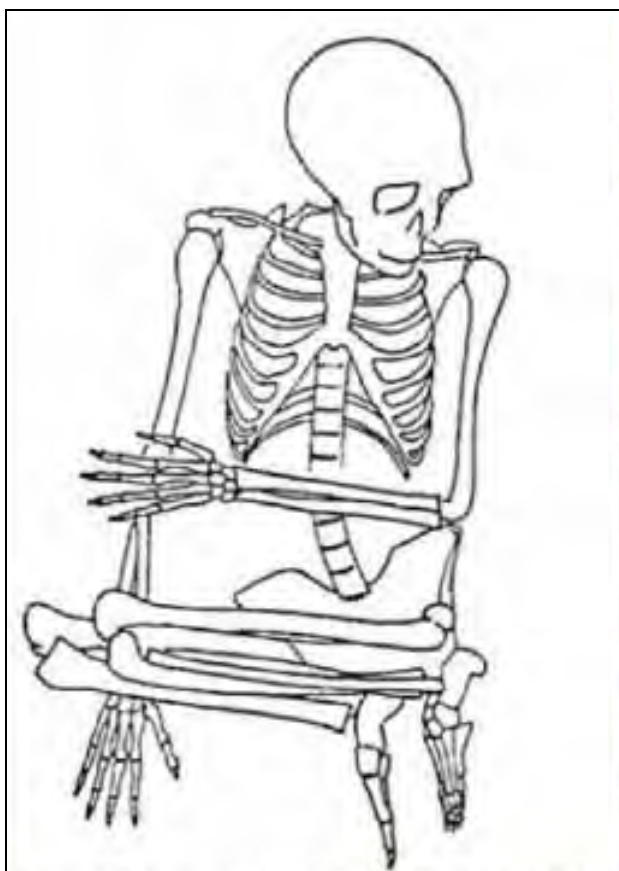
#### Refer to the Sydney Metro Exhumation Management Plan

Stop all work in the vicinity of the find. All bones uncovered during project works should be **treated with care and urgency** as they have the potential to be human remains. The bones must be identified as either human or non-human as soon as possible by a qualified forensic or physical anthropologist..

On the very rare occasion where it is immediately obvious from the remains that they are human, the Project Manager (or a delegate) should **inform the police by telephone** prior to seeking specialist advice. It will be obvious that it is human skeletal remains where there is no doubt, as demonstrated by the example in Figure 1<sup>10</sup>. Often skeletal elements in isolation (such as a skull) can also clearly be identified as human. Note it may also be obvious that human remains have been uncovered when soft tissue and/or clothing are present.

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<sup>10</sup> After Department of Environment and Conservation NSW (2006), *Manual for the identification of Aboriginal Remains*: 17



**Figure 1:** Schematic of a complete skeleton that is 'obviously' human<sup>12</sup>.



**Figure 2:** Disarticulated bones that require assessment to determine species.

This preliminary phone call is to let the police know that a specialist skeletal assessment to determine the approximate date of death which will inform legal jurisdiction. The police may wish to take control of the site at this stage. If not, a forensic or physical anthropologist must be requested to make an on-site assessment of the skeletal remains.

Where it is not immediately obvious that the bones are human (in the majority of cases, illustrated by Figure 2), specialist assessment is required to establish the species of the bones. Photographs of the bones can assist this assessment if they are clear and taken in accordance with guidance provided in Appendix C. Good photographs often result in the bones being identified by a specialist without requiring a site visit; noting they are nearly always non-human. In these cases, non-human skeletal remains must be treated like any other unexpected archaeological find.

If the bones are identified as human (either by photographs or an on-site inspection) a technical specialist must determine the likely ancestry (Aboriginal or non-Aboriginal) and burial context (archaeological or forensic). This assessment is required to identify the legal regulator of the human remains so **urgent notification** (as below) can occur.

Preliminary telephone or verbal notification by the archaeologist to the Sydney Metro Principal Manager Sustainability Environment and Planning (Program) appropriate. This

must be followed up later by a formal letter notification to the relevant regulator (as per Appendix G) when a management plan has been developed and agreed to by the relevant parties.

## **2. Range of human skeletal notification pathways**

The following is a summary of the different notification pathways required for human skeletal remains depending on the preliminary skeletal assessment of ancestry and burial context.

### **A. Human bones are from a recently deceased person (*less than 100 years old*).**

#### **Action**

A police officer must be notified immediately as per the obligations to report a death or suspected death under s35 of the *Coroners Act 2009* (NSW). It should be assumed the police will then take command of the site until otherwise directed.

### **B. Human bones are archaeological in nature (*more than 100 years old*) and are likely to be Aboriginal remains.**

#### **Action**

The OEH (Planning and Aboriginal Heritage Section) must be notified immediately. The Aboriginal Cultural Heritage Advisor must contact and inform the relevant Aboriginal community stakeholders who may request to be present on site.

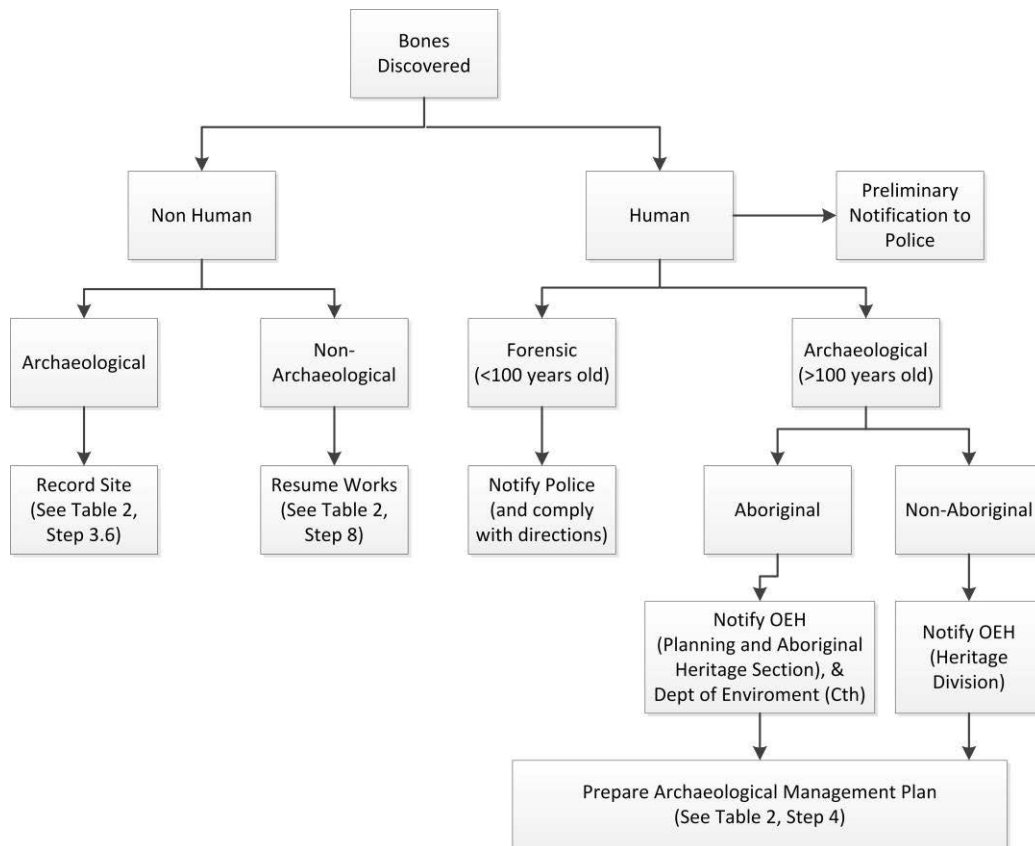
### **C. Human bones are archaeological in nature (*more than 100 years old*) and likely to be non-Aboriginal remains.**

#### **Action**

The OEH (Heritage Division) must be notified immediately

Figure 3 summarises the notification pathways on finding bones.





**Figure 3 Overview of steps to be undertaken on the discovery of bones**

After the appropriate verbal notifications (as described in 2B and 2C above), the Project Manager must proceed through the *Unexpected Heritage Items Exhumation Management Plan* (Step 4). It is noted that no *Exhumation Management Plan* is required for forensic cases (2A), as all future management is a police matter. Non-human skeletal remains must be treated like any other unexpected archaeological find and so must proceed to record the find as per Step 3.6.

### 3. Additional considerations and requirements

Uncovering archaeological human remains must be managed intensively and needs to consider a number of additional specific issues. These issues might include facilitating culturally appropriate processes when dealing with Aboriginal remains (such as repatriation and cultural ceremonies). Project Managers may need to consider overnight site security of any exposed remains and may need to manage the onsite attendance of a number of different external stakeholders during assessment and/or investigation of remains.

Project Managers may also be advised to liaise with local church/religious groups and the media to manage community issues arising from the find. Additional investigations may be required to identify living descendants, particularly if the remains are to be removed and relocated.

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If exhumation of the remains (from a formal burial or a vault) is required, Project Managers should also be aware of additional approval requirements under the *Public Health Act 1991* (NSW). Specifically, TfNSW is required to apply to the Director General of NSW Department of Health for approval to exhume human remains as per Clause 26 of the *Public Health (Disposal of Bodies) Regulation 2002* (NSW)<sup>11</sup>.

Further, the exhumation of such remains needs to consider health risks such as infectious disease control, exhumation procedures and reburial approval and registration. Further guidance on this matter can be found at the NSW Department of Health website.

In addition, due to the potential significant statutory and common law controls and prohibitions associated with interfering with a public cemetery, project teams are advised, when works uncover human remains adjacent to cemeteries, to confirm the cemetery's exact boundaries.

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<sup>11</sup> This requirement is in addition to heritage approvals under the *Heritage Act 1977*.





## Appendix E - Archaeological/heritage advice checklist

The archaeologist/Aboriginal heritage consultant must advise the Sydney Metro Principal Manager Sustainability Environment and Planning (Program) of an appropriate archaeological or heritage management plan as soon as possible after an inspection of the site has been completed (see Step 4). An archaeological or heritage management plan can include a range of activities and processes, which differ depending on the find and its significance.

In discussions with the archaeologist/Aboriginal heritage consultant the following checklist can be used as a prompt to ensure all relevant heritage issues are considered when developing this plan. This will allow the project team to receive clear and full advice to move forward quickly. Archaeological and/or heritage advice on how to proceed can be received in a letter or email outlining all relevant archaeological and/or heritage issues.

	Required	Outcome/notes
<b>Assessment and investigation</b>		
• Assessment of significance	Yes/No	
• Assessment of heritage impact	Yes/No	
• Archaeological excavation	Yes/No	
• Archival photographic recording	Yes/No	
<b>Heritage approvals and notifications</b>		
• AHIP, section 140, section 139 exceptions etc.	Yes/No	
• Regulator relics/objects notification	Yes/No	
• Notification to Sydney Trains for s170 heritage conservation register	Yes/No	
• Compliance with CEMP or other project heritage approvals	Yes/No	
<b>Stakeholder consultation</b>		
• Aboriginal stakeholder consultation	Yes/No	
<b>Artefact/heritage item management</b>		
• Retention or conservation strategy (e.g. items may be subject to long conservation and interpretation)	Yes/No	
• Disposal strategy	Yes/No	
• Short term and permanent storage locations (interested third parties should be consulted on this issue).	Yes/No	
• Control Agreement for Aboriginal objects	Yes/No	

## **Appendix F- Template notification letter**

Insert on TfNSW letterhead  
Select and type date]  
[Select and type reference number]

XXX

Manager, Conservation  
Heritage Division, Office of Environment and Heritage  
Locked Bag 5020  
Parramatta NSW 2124

[Select and type salutation and name],

**Re: Unexpected heritage item discovered during Transport for NSW –Sydney Metro activities.**

I write to inform you of an unexpected [select: relic, heritage item or Aboriginal object] found during TfNSW Infrastructure and Services construction works at [insert location] on [insert date] in accordance with the notification requirement under select: section 146 of the *Heritage Act 1977* (NSW). [Where the regulator has been informally notified at an earlier date by telephone, this should be referred to here].

**NB:** On finding Aboriginal human skeletal remains this letter must also be sent to the Commonwealth Minister for the Environment in accordance with notification requirements under section 20(1) of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Commonwealth).

[Provide a brief overview of the project background and project area. Provide a summary of the description and location of the item, including a map and image where possible. Also include how the project was assessed under the *Environmental Planning and Assessment Act 1979* (NSW) (e.g. Part 5). Also include any project approval number, if available].

Sydney Metro [or contractor] has sought professional archaeological advice regarding the item. A preliminary assessment indicates [provide a summary description and likely significance of the item]. Please find additional information on the site recording form attached.

Based on the preliminary findings, Sydney Metro [or contractor] is proposing [provide a summary of the proposed archaeological/heritage approach (e.g. develop archaeological research design (where relevant), seek heritage approvals, undertake archaeological investigation or conservation/interpretation strategy). Also include preliminary justification of such heritage impact with regard to project design constraints and delivery program].

The proposed approach will be further developed in consultation with a nominated Office of Environment and Heritage staff member.

Should you have any feedback on the proposed approach, or if you require any further information, please do not hesitate to contact [Environment and Planning Project Manager] on (02) XXXX XXXX.



Yours sincerely

[Sender name]

Sydney Metro Principal Manager Sustainability Environment and Planning (Program) [Attach the archaeological/heritage management plan and site recording form].



Integrated  
Management  
System

# Exhumation Management Plan

SM ES-PW-315/1.0

Sydney Metro Integrated Management System (IMS)

<b>Applicable to:</b>	Sydney Metro City & Southwest
<b>Document Owner:</b>	Heritage Manager
<b>System Owner:</b>	Executive Director, Safety, Sustainability & Environment
<b>Status:</b>	Final
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## 1. Introduction

Artefact Heritage have been engaged by Transport for New South Wales (TfNSW) to develop an Exhumation Management Plan (EMP) to provide TfNSW and their contractors with guidance on managing the discovery of human skeletal remains during the course of the Sydney Metro City & Southwest (the project). The project would involve construction and operation of a 15.5 km underground rail line, and new stations between Chatswood and Sydenham (Figure 1). As a Critical State Significant Infrastructure (CSSI) project, it is subject to assessment and approval by the Minister for Planning and Environment under Section 115ZB of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act).

The Conditions of Approval (CoA) relevant to this document are E26 and E27.

- CoA E26 states:  
*This approval does not allow the Proponent to harm, modify, or otherwise impact human remains uncovered during the construction and operation of the CSSI, except in accordance with the Exhumation Management Plan (Condition E27)*
- CoA E27 states:  
*An Exhumation Management Plan must be prepared to guide the relocation of recovered human remains. The Exhumation Management Plan must be prepared:*
  - (a) in consultation with, and meeting the requirements of, the OEH and NSW Health; and*
  - (b) 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), and other relevant guidelines and standards prepared by the Heritage Council of NSW or OEH.**The Exhumation Management Plan must be provided to the Secretary for information before the commencement of excavation works.*  
*Note: Human remains that are found unexpectedly during works are under the jurisdiction of the NSW State Coroner and must be reported to the NSW Police immediately.*

The purpose of this EMP is therefore to address CoA E27 to fulfil CoA E26 where required, by providing a clear and concise process to follow in the event of discovery of potential human remains during project works. The policy document may be used for the entire project (including Central Walk), although there is a focus on the potential remains at Central Station (former Devonshire Street cemetery) which have been identified in the Archaeological Research Design (ARD) (Artefact Heritage, 2016). This EMP focuses on non-Aboriginal remains specifically, although the process for differentiating Aboriginal and non-Aboriginal remains is included.

## 1.1. Methodology

This EMP is submitted as a two-stage plan. Stage 1 (this document) satisfies the requirements CoA E27, outlining the procedure for the discovery and management of human remains within the Sydney Metro project area. Specific tasks for Stage 1 are as follows:

- Discussion of relevant legislation and guidelines, (e.g. Coroners Act 2009, Heritage Act 1977, Guidelines for the Management of Human Skeletal Remains and the Public Health Regulations 2012).
- Archaeological methodology for excavation of remains including processes for appropriately handling remains in accordance with the relevant guidelines.
- Preparation of a flow chart process to be used by contractors to respond to the discovery of suspected human remains.

Stage 2 will outline post-exhumation management primarily around relocation, processing and long-term arrangements. This stage will include the nomination of a physical anthropologist and temporary storage location, process for additional analysis including DNA testing, isotope analysis and environmental sampling, and discussion on requirements for public involvement.

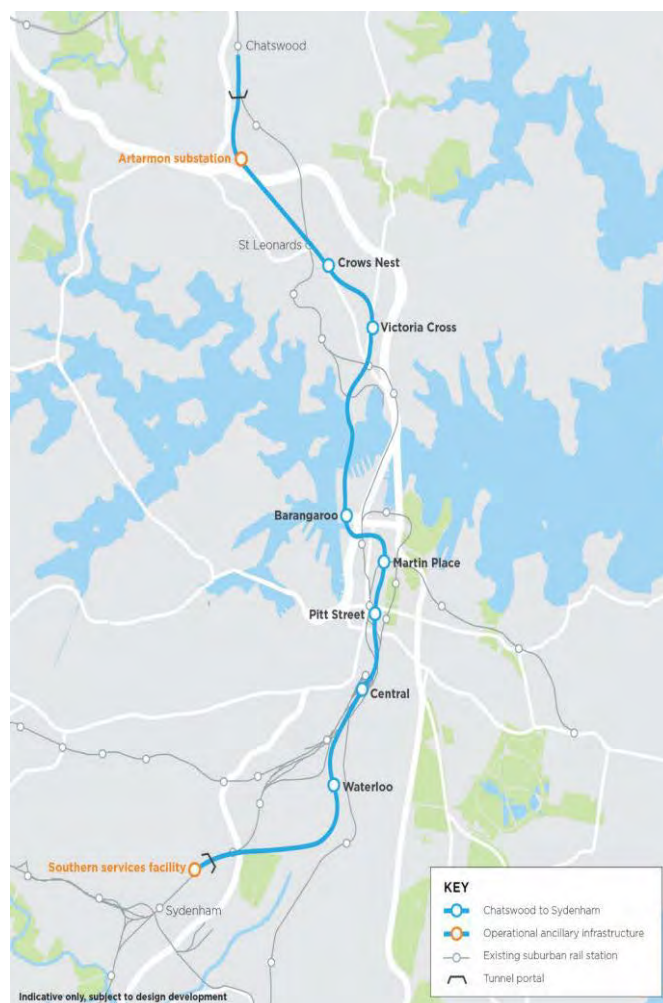


Figure 1: Project overview and station locations

## 1.2. Brief historical overview: Devonshire Street cemetery (Central Station)

The northern part of the Central Station site was occupied by the former nineteenth century Devonshire Street cemetery, specifically the Church of England, Presbyterian, Wesleyan and Roman Catholic burial areas. The burial grounds, called the Sandhills Cemetery or the Devonshire Street Cemetery, was consecrated in 1820<sup>1</sup>. The site was chosen due to the remote location of the cemetery compared to the growing town of Sydney. The cemetery was declared at capacity, and took no more burials from 1865 onwards. Images from the 1890s, shortly before the cemetery was resumed for the expansion of the station, show that the original brick walls for the burial ground were still intact<sup>2</sup>.

Proposals had been raised in the 1880s and 1890s for the construction of a larger station facility at Central Station was adopted and the clearing of the Devonshire Street cemetery commenced in 1901. On the 17 January 1901, the government issued a notice declaring that representatives of any deceased in the cemetery must remove their relatives within two months<sup>3</sup>. By 1902 clearing had been completed.

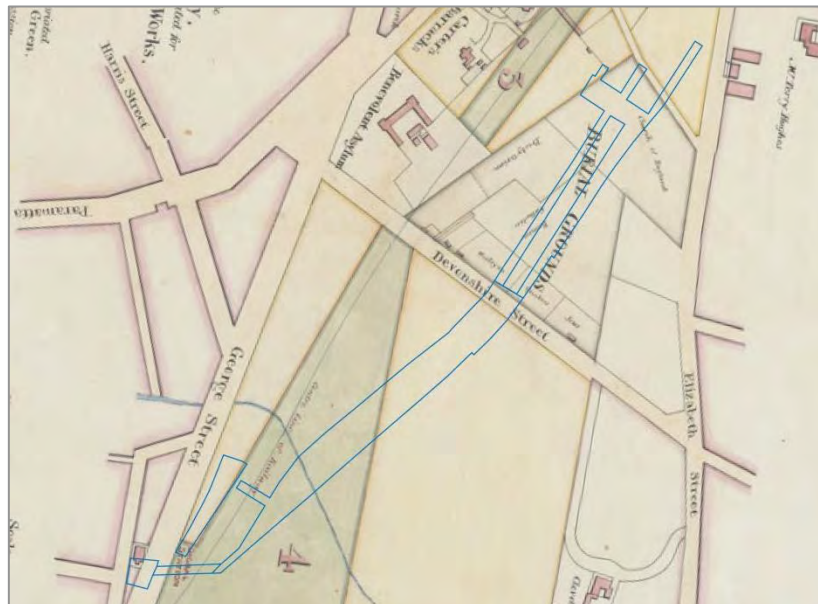


Figure 2: 1848 plan of proposed Central railway station with Devonshire Street cemetery marked as 'Burial Grounds' and the current station footprint indicated by the blue line<sup>4</sup>

<sup>1</sup> *The Sydney Gazette and New South Wales Advertiser*, 5 February 1820.

<sup>2</sup> Artefact Heritage, 2016. *Sydney Metro City & Southwest Chatswood to Sydenham Historical Archaeological Assessment & Research Design*. Report to Jacobs/Arcadis/RPS, pp.227-228.

<sup>3</sup> *The Sydney Morning Herald*, 25 January 1901.

<sup>4</sup> Source: State Records NSW, SR Map 6408 with overlay by Artefact Heritage 2016.





Figure 3: 1890s photo of the Church of England area of the Devonshire Street cemetery, facing south from north-eastern corner<sup>5</sup>

### 1.3. Archaeological potential of former Devonshire Street cemetery, Central Station

Artefact Heritage prepared an historical ARD for the project to assess archaeological potential and recommend appropriate management and mitigation measures. Central Station was assessed as having low potential for State significant archaeological remains associated with Devonshire Street cemetery as follows:

*The Devonshire Street cemetery was located in the northern half of the Central Station site. Remaining material from the cemetery could include structural remains such as former footings for the deconstructed burial ground walls, residual brick and stone tombs, and tombstones. Coffins, coffin furniture and human skeletal remains and associated artefacts may also be preserved. Evidence of grave excavation in the form of cut soils and potential clay and sand backfill would be located from the base of the grave shaft to the top of the former ground level.<sup>6</sup>*

As potential for human skeletal and burial-related remains cannot be ruled out entirely, recommended mitigation measures include archaeological monitoring of all ground disturbance and bulk excavation within the former Devonshire Street cemetery (Sites CS 2 and CS 3) and archaeological testing in Site C3 once the top of the sand layers is exposed during bulk excavation. This EMP applies if human skeletal remains or burial-related archaeological material is identified.<sup>7</sup>

<sup>5</sup> Source: State Library of New South Wales

<sup>6</sup> Artefact Heritage 2016: 238.

<sup>7</sup> Ibid, pp.255-257

## 1.4. Overview of legislative requirements for dealing with human remains

The following section provides an overview of the various legislation that would apply to the discovery, management and relocation of human remains. A discovery of suspected human remains may be subject to different Acts and requirements, thereby triggering different notification pathways, based on the specific circumstances involved.

Whilst the first step will always be to notify NSW Police, further confirmation of the age (antiquity) and nature of the skeletal remains as well as the reasons for the disturbance will dictate which Act and provisions will be enacted.

The Procedure for the Discovery, Management and Relocation of Human Remains and flowchart follows this section.

Although approval under the Heritage Act 1977 and the National Parks and Wildlife Act 1973, is not required for a CSSI project, notification to the Heritage Council under s146 of the Heritage Act, and notification of an Aboriginal object under the National Parks and Wildlife Act is still required for discovery of archaeological human remains. The provisions of the Coroners Act 2009 and Public Health Regulation 2012 apply under a CSSI approval. Compliance with this legislation would be fulfilled through adhering to the processes outlined in this plan.

## 1.5. Discovery of human remains and forensic cases: Coroners Act 2009 (NSW)

A discovery of suspected human remains less than 100 years old is a forensic case by definition and the remains would come under the jurisdiction of the State Coroner and the Coroners Act 2009 (NSW). Such a case would be considered a 'reportable death' and under legal notification obligations set out in s35 (2); a person must report the death to a police officer, a coroner or an assistant coroner as soon as possible. This applies to all human remains less than 100 years old regardless of ancestry (i.e. both Aboriginal and non-Aboriginal remains).

### *35 Obligation to report death or suspected death*

*(1) This section applies to any person who has reasonable grounds to believe that a death or suspected death of another person:*

*(a) is a reportable death or occurred in circumstances that would be examinable under Division 2 of Part 3.2, and*

*(b) has not been reported in accordance with subsection (2).*

*(2) A person to whom this section applies must report the death or suspected death concerned to a police officer, a coroner or an assistant coroner as soon as possible after becoming aware of the grounds referred to in subsection (1).*

*Maximum penalty (subsection (2)): 10 penalty units.*

*(3) A police officer to whom a death or suspected death is reported under this section is required to report the death or suspected death to a coroner or assistant coroner as soon as possible after the report is made.*

*(4) An assistant coroner to whom a death or suspected death is reported under this section is required to report the death or suspected death to a coroner as soon as possible after the report is made.*

*(5) A coroner to whom a death or suspected death is reported under this section is required to inform the State Coroner of the report as soon as practicable after the report is made.*

## **1.6. Historical human remains: Heritage Act 1977 and Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977**

The Heritage Act 1977 and Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977<sup>8</sup> apply to historic burials in New South Wales. It should be noted that the Guidelines are outdated in terms of the current statutory framework.

The definition of an archaeological 'relic' under the Heritage Act changed in 2009. A relic is no longer defined as an object of at least 50 years of age, but is now defined as an archaeological deposit, or artefact that has heritage significance at a local or State level. New guidelines Assessing Significance for Historical Archaeological Sites and 'Relics' have been endorsed by the Heritage Council and should be used to assess the level of heritage or archaeological significance of the remains. With reference to burial grounds, objects such as headstones, grave enclosures and grave goods, as well as buried human remains may be a 'relic'.

As the project is approved as CSSI, an application to NSW Heritage Council for an excavation permit (either Section 140 or Section 60) is not required. Notification to the NSW Heritage Council (or delegate) is required under the CSSI approval (E20) if relics, including human remains, are located.

The CoA address archaeology and heritage matters and, specifically, CoA E27 requires that this EMP be prepared and followed as the guiding document for the unexpected discovery of human remains.

## **1.7. Aboriginal human remains: National Parks and Wildlife Act 1974 (NPW Act)**

The NPW Act, administered by the OEH, provides statutory protection for all Aboriginal 'objects' (consisting of any material evidence of the Aboriginal occupation of NSW) under Section 90 of the Act, and for 'Aboriginal Places' (areas of cultural significance to the Aboriginal community) under Section 84.

Discovery of Aboriginal burials and/or human remains is addressed in the Aboriginal Cultural Heritage Assessment Report (ACHAR) prepared by Artefact Heritage in 2016. The report was prepared in accordance with the Environmental Impact Statement mitigation measures relevant to Aboriginal heritage (AH1 to AH6), the NSW Office of Environment and Heritage (OEH) 'Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation'<sup>9</sup>, the OEH 'Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW'<sup>10</sup>, the OEH 'Aboriginal cultural heritage consultation requirements for proponents 2010'<sup>11</sup>, the OEH 'Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales'<sup>12</sup>.

<sup>8</sup> NSW Heritage Office, 1998.

<sup>9</sup> NSW Department of Environment and Conservation, 2005.

<sup>10</sup> OEH 2011.

<sup>11</sup> Department of Environment, Climate Change and Water 2010.

<sup>12</sup> OEH 2010.



If suspected human skeletal remains are uncovered at any time during the archaeological management program, the process as outlined in this EMP and detailed in the flow chart is to be followed. Management of the remains would be guided by consultation with the nominated Registered Aboriginal Parties (RAPs) for the project, in adherence to the ACHAR.

### **1.8. Exhumation of human remains: Public Health Regulation 2012 (NSW) and the NSW Health Policy Statement – Exhumation of human remains (2013)**

Public Health Regulation 2012 and the NSW Health Policy Statement – Exhumation of human remains of the Public Health Regulation 2012 provides specific regulation for the exhumation of bodies in NSW.

Under Clause 70 an application for approval to exhume the remains of a dead person may be made to the Director-General via an approved form to the Director of the local Public Health Unit that acts on behalf of the Director-General of NSW Health. Exhumation not to take place unless an authorised officer or a member of staff of NSW Health is present at the exhumation (the grave may be excavated to the lid of the coffin but nothing must be disturbed until the arrival of the authorised officer) (Clause 72). An authorised officer must be present at the exhumation to ensure that the correct interment is opened, to ensure that all of the remains are exhumed and to enforce the protection of public health should this be necessary.

TfNSW would be required to apply to the Director General of NSW Department of Health for approval to exhume human remains as per Clause 26 of the Regulations.

### **1.9. NSW Health Policy Statement – Exhumation of human remains (2013)**

The NSW Health Policy Statement on the exhumation of human remains provides the policy to be observed by Public Health Units located in Local Health Districts, on receipt of an application to seek permission for approval of the exhumation of human remains under the Public Health Regulation 2012. Public Health Units (PHUs) of Local Health Districts (LHDs) in NSW facilitate the approval for an exhumation.

Under Clause 69 a person must not exhume a body unless the exhumation of the remains has been approved by the Director-General. An application for permission to exhume the remains of a deceased person is to be made to the PHU on the approved form which is contained at the [NSW Health website](#).

The required form is appended to this EMP for ease of reference.

### **1.10. Work Health and Safety Act 2011**

The Work Health and Safety Act 2011 provisions apply to protect personnel involved in the exhumation procedure by creating and maintaining safe and healthy work practices and are enforced by WorkCover NSW. Graves, crypts and vaults could be considered to be confined

spaces in some circumstances under health and safety legislation. More information on safe work practices is available at or by contacting SafeWork NSW via their website or directly.

Health and safety aspects of working with human remains should be considered. Generally, working with archaeological human skeletal remains requires no extra precautions to be taken beyond normal health and safety regulations. Once any necessary site health and safety precautions have been taken, the exhumation of human remains can proceed.

## 2. Procedure for the discovery, management and relocation of human remains

This procedure provides project management, principal contractors and project archaeologist with advice on the steps to follow upon uncovering suspected human remains. Archaeological heritage and the potential for burials and human remains would be included in the general project induction for all personnel. The induction would include procedure as set out in this EMP.

### 2.1. Initial discovery of bones: What do we do?

To avoid doubt, all suspected bone must be treated as potential human skeletal remains and work around them must stop while they are protected and investigated as a matter of urgency.

#### 1. Stop Work and preliminary notification

Upon the discovery of bone (suspected human remains), all work in the area of the find must stop and the remains must be confirmed as being human or not. Preliminary notification must be made to the NSW Police in compliance with Section 35 of the Coroners Act 2009.

<b>What?</b>	When bones are uncovered at a site, all work in the area the find must <b>stop immediately</b> and the site must be secured.
<b>Who?</b>	The discoverer will <b>immediately</b> notify machinery operators so that no further disturbance of the remains will occur, as well as notify the foreman/site supervisor, principal contractor, project archaeologist and Sydney Metro Environmental Representative (CoA A22). Preliminary notification to the NSW Police will be undertaken by the Environmental Representative. Notification should provide verbal description of the remains and inform the police that consultation with technical specialists is being undertaken to confirm that the remains are human, as well as the burial context (archaeological or forensic, refer Step 2).
<b>How?</b>	Inform all site personnel of restricted access to the area of the discovery until further notice. Area must be fenced off (flagging or temporary exclusion fencing).
<b>Actions</b>	Notify site supervisor, principal contractor, project archaeologist / Excavation Director and Sydney Metro Environmental Representative of the find and protect the suspected remains until an initial assessment can be undertaken by a technical specialist. Preliminary notification to NSW Police.

#### 2. Confirm human provenance

Skeletal remains could either be articulated and in a recognisable form of burial such as a coffin or common burial position of the body (e.g. supine, prone or flexed) or they could be disarticulated or fragmented remains. Within the boundaries of a known historic burial ground, there is a high probability of the remains being human. In a suspected forensic case, the remains may have clothing and/or human tissue. Disarticulated or fragmented bones are often uncovered and these may require specialist assessment to determine legal jurisdiction.

If suspected human remains are identified during the course of project works, preliminary notification must be made to the NSW Police in compliance with Section 35 of the Coroners Act 1999 (refer Step 1). NSW Police would be again be contacted immediately upon receipt of confirmation of human provenance.



<b>What?</b>	Confirmation that the remains are human, their burial context - whether they are forensic (less than 100 years) or archaeological (older than 100 years) and suspected ancestry (Aboriginal or non-Aboriginal).
<b>Who?</b>	Forensic or physical anthropologist, or archaeologist with specialist skills such as an osteoarchaeologist.
<b>How?</b>	Consultation could be undertaken as either an on-site inspection or via good quality photos sent to the nominated technical specialist of 1) the remains; and 2) the site general site location of the discovery.
<b>Actions</b>	<p>Contact nominated technical specialists to confirm that the remains are: a) human, b) burial context (archaeological or forensic), and c) suspected ancestry (Aboriginal or non-Aboriginal).</p> <p>For the duration of the Sydney Metro project, the nominated technical specialists are:</p> <ul style="list-style-type: none"> <li>• Forensic Anthropologist – TBC by contractor for project area.</li> <li>• Nominated Excavation Director – TBC by contractor for project area.</li> </ul> <p>The archaeologist may be able to identify the nature of remains without input from the Forensic Anthropologist. The Forensic Anthropologist should be contacted as required.</p>

### 3. Notification based on jurisdiction (forensic or archaeological)

Once confirmation is received from the technical specialist that the remains are of human origin, there are three possible statutory pathways to follow based on the assessment:

- **Forensic case (remains are less than 100 years old):** If it is determined by specialist assessment (Step 2) that the remains are forensic, the remains would come under the jurisdiction of the State Coroner and the Coroners Act 2009. The NSW Police would likely secure the site and will advise on the procedure to be followed.
- **Archaeological – non-Aboriginal human remains (more than 100 years old).**  
 Actions: Notification to OEH and, Heritage Division. Follow the Archaeology Exhumation Methodology as set out in Step 4.
- **Archaeological – suspected Aboriginal human remains (more than 100 years old).** The RAPs must be present where it is reasonably suspected that Aboriginal burials or human remains have been encountered. Recording of Aboriginal ancestral remains must be undertaken by, or be conducted under the direct supervision of a specialist.  
 Actions: Notify RAPs and follow ACHAR (Artefact Heritage 2016). Notification to OEH and Heritage Division. Follow the Archaeology Exhumation Methodology as set out in Step 4.

### 4. Archaeological Exhumation Methodology

The following section provides the archaeological methodology for exhumation and the appropriate handling of human remains.

**Securing the Site:** The strategy for the excavation and removal of human remains must be sensitive to public opinion and ethical issues and exhumation activities should not be visible to the general public. The site may need to be screened off from public areas, not only with hoarding but also in some cases with a roof to screen the site off from overlooking buildings. At all times, human remains should

be treated with respect and dignity. The perimeter of the excavation site should be demarcated by plastic tape or flagging and only technical staff allowed in this area for the duration of exhumation activities.

**Excavation Director:** Archaeological investigations would be managed by a suitably qualified Excavation Director with experience in the historical archaeology of Sydney and management of human remains. For sites with potential for locally significant remains the Excavation Director should meet the NSW Heritage Council criteria for locally significant archaeological sites. For site with potential for State significant archaeology the Excavation Director should meet the NSW Heritage Council criteria for State significant archaeological sites.

**Excavation and Recording:** Exhumation and recording would be undertaken in accordance with best practice forensic and Heritage Division guidelines. Prior to removal, the remains need to be fully recorded in situ to understand their surrounding archaeological context. This will include recording any disturbances to the burial, identification of bones present. In some cases, the deposit of bones may be a mixture of articulated and disarticulated remains and care should be taken to distinguish articulated remains, and to assess if they represent commingled individuals or disturbed remains belonging to one individual, and to record them accordingly.

**Recording:**

- A standard context recording system will be employed.
- Detailed survey and/or measured drawings would be prepared and include location of remains within the overall site (position of the body, the direction of the burial, noting any stratigraphic relationships with other archaeological features).
- Any associated artefacts (potential grave goods, burial furniture) would be recorded and collected by context for later analysis.
- Digital photography, in RAW format, using photographic scales and photo boards where appropriate. A photographic record of all phases of the work on site would be undertaken.
- Registers of contexts, photos, samples and drawings would be kept.

**Excavation:**

- Detection of the extent of the grave/remains (if disarticulated).
- Surface soils removed in excavation units of 100mm (site dependent) using small tools.
- Expose remains with soft paint brushes and pedestal the remains.
- Record position and depth of remains.
- Soil removed would be sieved through 3mm mesh to examine for trace elements.
- Soil samples may be taken from the abdominal and/or chest areas of the body (articulated remains) to retrieve evidence of gallstones or worm infestations.
- Exhumation would be under the control of the Excavation Director/ Forensic Anthropologist and in the presence of an authorised officer or a member of staff of the Ministry of Health.

- Further excavation of the bottom of the pit (grave) following removal to confirm the absence of further remains.

**Relocation of bones:**

- Removal and collection of skeletal remains to follow standard forensic practice of labelling.
- Remove remains from the ground systematically and place in plastic bags according to anatomical areas of the body.
- Bags should not be air-tight and should have ventilation holes to prevent deterioration of fragile skeletal material. Each bag should contain labels and the separate bags should then be placed in a large plastic bag, crate or box, labelled with the context information.
- The remains should be placed in a sturdy, large cardboard box (approximately 600 x 300 x 200 mm) for relocation to off-site processing location.

**Resume work:** Construction work may only recommence upon receipt of clearance from both the Excavation Director and Health official. If a forensic case, written authorisation from the NSW Police is required.

**Reporting:** Stage 2 will outline research questions and the post-excavation processing procedure. A report would be prepared following the completion of the program of exhumation works, separate to the archaeological excavation report for the project. This report would include skeletal analysis catalogue, comprehensively describe the process of exhumation, detail the recording of the remains and synthesise the results of any further laboratory testing. An assessment of significance for the remains would be provided and interpreted within the context of the archaeological research design (response to research questions.)



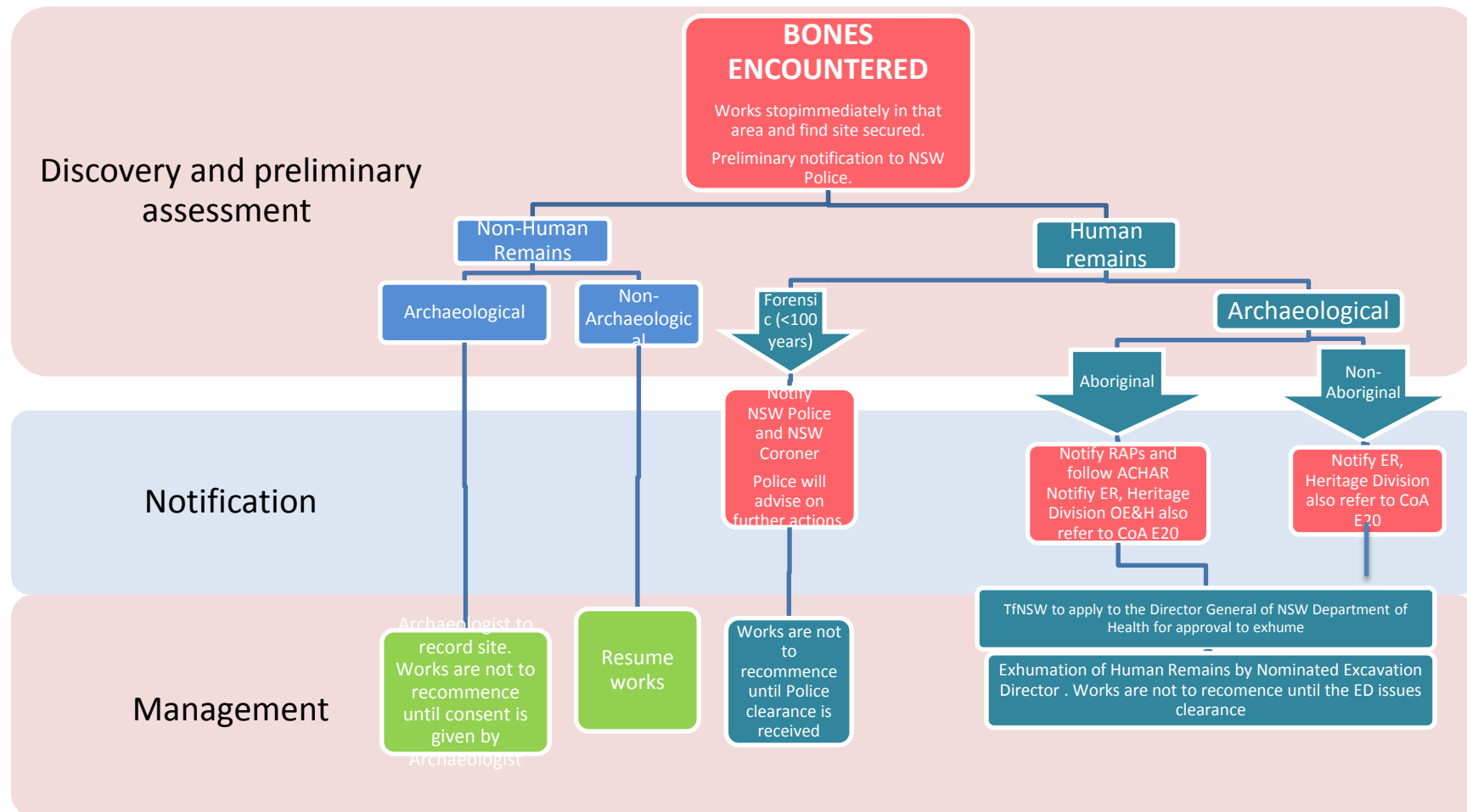


Figure 4: Exhumation Policy flow chart

### 3. Addendum

NSW Health Policy Directive for Exhumation of Human Remains including template application for permission to exhume the remains of a deceased person (NSW Ministry of Health).

### 4. Accountabilities

The Executive Director, Safety, Sustainability & Environment is accountable for this Plan including authorising the document, monitoring its effectiveness and performing a formal document review.

Direct Reports to the Program Director are accountable for ensuring the requirements of this Plan are implemented within their area of responsibility.

Direct Reports to the Program Director who are accountable for specific projects/programs are accountable for ensuring associated contractors comply with the requirements of this Plan.

### 5. Definitions

All terminology in this Plan is taken to mean the generally accepted or dictionary definition. Other terms and jargon specific to this Plan are defined within [SM QM-FT-435 Integrated Management System \(IMS\) Glossary](#).

### 6. Related Documents and References

#### Related Documents and References

- n/a

### 7. Superseded Documents

#### Superseded Documents

There are no documents superseded as a result of this document.

### 8. Document History

Version	Date of approval	Notes
1.1	May 2017	New IMS document.

## **Addendum 1**

NSW Health Policy Directive for Exhumation of Human Remains





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# **LANDSCAPE CHARACTER AND VISUAL AMENITY TECHNICAL INFORMATION**

APPENDIX G





# Landscape character and visual amenity technical information

## Landscape and visual sensitivity levels

The following summarises the landscape and visual sensitivity for locations within the Central Station study area which are relevant to the elements of the proposed modification.

### Central Station (including underground concourses and station platforms)

Central Station is State heritage listed and has numerous elements of high and exceptional significance within the precinct including the clock tower, which from the day it was built through to today is a landmark contributing strongly to the visual prominence of the station and Railway Square. It is the busiest station and hub of the network and attracts customers from across the state and interstate. As stated in the Central Station Conservation Management Plan 2013, *the massive sandstone edifices of the main terminus and the clocktower are recognised for their landmark qualities from various vantage points around the site and are a key component of the significance of the place*. The landscape setting and views of these from the public domain are therefore of state sensitivity, whereas the views from moving trains and the station platforms and to associated heritage buildings, such as the Mortuary Station, are of **regional sensitivity**.

### Chalmers Street

Chalmers Street, between Rutland and Bedford Streets, has an esplanade frontage to Prince Alfred Park, and is lined with mature Fig trees and several State heritage listed buildings. This is a busy one-way thoroughfare between Sydney's inner southern suburbs and the central business district via Elizabeth Street. It is also a well-used corridor for pedestrians accessing Central Station from the east, it contains a bus interchange and has a direct entry to the Devonshire Street Tunnel. The landscape setting of Chalmers Street and its views are of **local sensitivity**.

### Randle Lane, residential and commercial properties on Chalmers Street

Randle Lane provides rear access to several medium density commercial and residential properties. Although views within Randle Lane itself are largely contained and the purpose of the lane is primarily access, buildings located to the east on Chalmers Street overlook Central Station, and include views to the Central Station clock tower, and CBD skyline beyond. Hotels such as the Bounce hostel, at number 20-28 Chalmers Street, use these views in their marketing material. This area is experiencing inner city urban renewal and has a mixed character with both rundown and newly renovated buildings. This streetscape and views from residential and commercial properties in this area are of **neighbourhood sensitivity**.

### Prince Alfred Park

Prince Alfred Park is an important recreational resource within the southern part of the CBD and has both historical and aesthetic value to the local community. It is a gathering place, highly valued by residents and visitors to the area. This park has a state heritage listing, and a noteworthy framework of mature vegetation (London plane trees, Oaks, Brush box, Phoenix palms, Moreton Bay figs, Kauri pines) which date to the original c.1869 landscape design. District view are available from the park to the Central Station clock tower and yards. The landscape setting and views of Prince Alfred Park are of **regional sensitivity**.

## Assessment of landscape impact

One landscape character area, the Northern Concourse, was assessed for the approved project. The proposed modification would not result in any additional landscape impacts to this area and, as such, there would be no change to the approved project impacts.

The proposed modification would, however, introduce potential landscape impacts in new areas. Two additional landscape areas were identified and assessed for further impacts from the proposed modification. The additional landscape areas are:

- Central Station
- Chalmers Street.

## Central Station

### Existing conditions

There are currently seven station entrances/exits located at Central Station, with four concourses: the Grand Concourse in the northwest, North Concourse to the north, South Concourse to the southeast of the platforms, and the Eastern Suburbs Railway concourse to the east beneath Chalmers Street.

Within the station, the existing underground tunnels connecting entry concourses with the platforms are generally long, narrow tunnels, including several doglegs, diagonal and parallel sections, and dead-ends. This existing arrangement results in reduced legibility within the station and a greater reliance on signage for wayfinding.

Furthermore, due to stair only access from the converted baggage tunnels, the only accessible route to all station platforms is via the North Concourse and Grand Concourse at the northern end of the station. This results in mobility impaired customers travelling longer distances to interchange between services or to exit the station.

As part of the approved project works a new temporary underground pedestrian connection would be established early in the program to enable construction of the north-south metro concourse, and maintain interchange connectivity between the suburban and intercity platforms.

The intercity platforms (platforms 1-15) are brick tile in a basket weave pattern with a corbelled coping of brick and tile. Platform 4/5, which would have some temporary works, has no canopy cover or furnishings at its southern end. Platforms 12-15 will be demolished as a part of the approved project.

The rail line to the suburban platforms (platforms 16-23) enter the station from both the south and north, over Eddy Avenue. The suburban platforms are covered with gabled canopies (c1920s) of concrete supported with twin steel columns and with exposed steel trusses. These platforms are accessed from below by stairs and lifts. Across the station, the platforms are brick tile in a basket weave pattern with a corbelled coping of brick and tile.

### Landscape impact of the proposed modification during construction

Access to the station via entry concourses would not be altered by the construction of the east concourse and platform works and access to and between all suburban platforms and operational intercity platforms would be maintained. However, ease of access would be somewhat reduced as existing tunnels are closed and pedestrian routes are diverted, and works are undertaken to reconfigure the ticket gateline at the South Concourse. This may result in some additional distances required to access all areas of the station and platform.

At platform level, there would be reduced access as some platforms are closed during possessions and after hours, as a construction site is established across a central section of platforms 16-23 for platform works and construction of vertical transport structures. During the platform refresh works there would not be customer access to the platform, as this work would be undertaken during possessions and after hours. There would be limited impact on customer access as other platforms would be used during these times.

There would be some reduction in legibility and wayfinding within the station as existing stairs and tunnels are closed, routes are diverted and new temporary routes opened. It is likely that temporary signage would be required during this time to direct customers during progressive changes to routes.

Comfort and amenity for customers within the station would be reduced as construction activity reduces the functional area of the Eastern Suburbs Railway concourse and some tunnels and the close proximity of the works being undertaken on the platforms. The introduction of construction activity would reduce amenity for customers.

A services route would cross the rail corridor via a gantry and extend with some trenching along platform 4/5. There would be a temporary impact on this intercity platform as this work is undertaken, however, customer access to the platform would not be restricted during this time, and there would not be an appreciable change in amenity experienced by customers.

Due to the operational nature of the station there would be surveillance of the internal station concourses and tunnels. However, the works may impact sight lines and visibility within the station, potentially reducing the perception of safety somewhat.

The existing heritage brick wall, along the eastern station boundary (parallel to Platform 23), includes multiple interpretive panels (Station heritage information). The dismantling of a section of this heritage brick wall would also require the removal of some of the existing interpretive panels. The temporary loss of both the wall and interpretive panels would reduce the vibrancy, diversity and legacy of this area. The retention of the heritage character canopies, however, would also retain the character of the platforms.

Below the existing Devonshire Street station entry the removal of one retail premises would be required. Although this would somewhat reduce the activation and vibrancy of the concourse in this area, there would not be an appreciable change as surrounding existing retail premises would be retained.

Overall it is expected that there would be a noticeable reduction in the landscape (urban design functionality) of the station underground concourse areas, due particularly to a reduction in accessibility, legibility and wayfinding. The station is of regional landscape sensitivity, resulting in a **moderate adverse** landscape impact during construction.

## Landscape impact of the proposed modification during operation

Accessibility to the station would be substantially improved as the east concourse would link the future north south metro concourse with the Eastern Suburbs Railway concourse and new eastern entrance to the station. The eastern entry would provide a fourth, central entry along the eastern boundary of the station.

The east concourse would be at the same level as the Eastern Suburbs Railway concourse and the metro concourse so that there is a consistent grade. The east concourse and the eastern entry would provide a new accessible route, and there would be both lift and escalator access to all suburban platforms, providing substantial improvements in travel time and functionality. A wider, more open area would also be provided for customers at the South Concourse, as internal buildings are relocated and the gateline is realigned.

Accessibility around the platforms would also be improved as clutter is removed and platform levels are adjusted to ensure suitable levels are achieved on the platforms. There would also be fewer obstructions along boarding areas.



The introduction of a wide and straight concourse would improve legibility and wayfinding by creating clear sight lines, and direct, continuous, and sequential access between the future metro platforms and all suburban platforms. Legibility and wayfinding would also be improved where new signage is installed.

Compared to the narrow and congested existing tunnels and concourses, the proposed east concourse would be an improvement with a generous width (around 19 metres) and height (around four metres). This wider, more spacious concourse would improve comfort and amenity for customers. Improvements to the amenity of the station platform areas would also result from the new and refreshed platform surfaces, and upgraded lighting.

The east concourse would be a straight corridor, wider and more open, improving sight lines and the perception of safety. This space would be staffed and have security monitoring for safety. Customer use would also activate the concourse.

The safety of the platforms would be improved as they are regraded (where possible), resurfaced and equipment provided to improve Disability Discrimination Act compliance. This would include the regrading of platforms levels so that they fall away from the platform edge and trip hazards are eliminated, installation of new and consistent tactile ground surface indicators (TGSIs), upgraded fire life safety, CCTV and emergency help phone equipment. Sight lines would also be enhanced by the removal of clutter. Central Walk would provide improved lighting, also creating improved safety at night.

The retention of the heritage character canopies would retain the vibrancy and legacy of the station platforms. Furthermore, below the Devonshire Street station entry, ventilation facilities would occupy the former retail premises site, somewhat reducing the opportunity for activation and vibrancy of the concourse in this area.

Overall it is expected that there would be a noticeable improvement in the landscape quality of the station due to improved accessibility, legibility and wayfinding, comfort and amenity provided by the east concourse and platform refresh. This precinct is of regional sensitivity, resulting in a **moderate beneficial** landscape impact during operation.

## Chalmers Street

### Existing conditions

Chalmers Street is four lanes wide in this area, including two lanes of on street parking. CBD and South East Light Rail will transform Chalmers Street so that it includes a light rail corridor and interchange at Central Station. There would be footpaths to both the east and west of the light rail corridor in a similar location to the existing footpaths as well as a dedicated cycle way. On the eastern side of Chalmers Street, the built form rises between six and ten stories. This includes a dental hospital in the north, residential and hotel accommodation with bars and cafes at street level. The Central Walk site includes the Bounce Hostel, which spans between Chalmers Street and Randle Lane. Randle Lane includes mainly service entries at lower levels with no dedicated footpaths. Several buildings addressing on the lane include residential and commercial uses above.

### Landscape impact of the proposed modification during construction

Accessibility on Chalmers Street and Randle Lane would be reduced during construction. The footpath along Chalmers Street would be reduced in width as a construction site is established on the Bounce Hostel site and scaffolding and hoarding is established. At times the works would extend across the full width of the footpath, temporarily requiring the diversion of pedestrian movement.

The introduction of construction vehicle access would impact on access along Randle Lane. There would also be a temporary closure of the lane, which would require the diversion of traffic around the lane.

A section of an existing brick wall along the western side of Chalmers Street would be dismantled as part of the construction of the east concourse. An area of the western footpath would be closed to the public, and occupied until the wall is reconstructed. This work would temporarily reduce the footpath width and restrict north south pedestrian movement between the station and future light rail stop.

As the worksite is largely contained within the building footprint there would not be a change in the legibility and wayfinding of Central Station or the light rail. There may be some temporary reduction in legibility and wayfinding for local pedestrian, cyclists and vehicular movement as Randle Lane is closed and works extend into the footpath / cycle path on Chalmers Street.

There may be a slight reduction in the level of comfort and amenity for pedestrians on Chalmers Street as the construction site is established adjacent to these pedestrian areas.

The removal of the Bounce Hostel would reduce the level of activity on Chalmers Street somewhat. The extension of construction activity into footpaths may reduce sight lines near the works, reducing the perception of safety.

The diversity of built form within the streetscape would be reduced somewhat as the heritage character Bounce Hostel building is demolished. The heritage brick wall along the eastern station boundary (parallel to Platform 23) would be reinstated and the interpretive panels (Station heritage information) replaced. This would reverse the reduction in vibrancy and enduring legacy experienced during construction.

Overall it is expected that there would be a noticeable reduction in the landscape of Chalmers Street, due particularly to a reduction in accessibility. As Randle Lane and Chalmers Street includes receivers of neighbourhood and local sensitivity respectively, this would result in a negligible to **minor adverse** landscape impact during construction.

## **Landscape impact of the proposed modification during operation**

There would be improved accessibility to the station with an additional station entrance mid-way between the South and North Concourse entries. This entry would include accessible vertical transport with both lift and escalators. The location of this station entry, adjacent to the future light rail stop and cycleway, would improve and complement the concentration of public transport options in this location.

The location of this station entry to the east of Chalmers Street, and its visual separation to the main station buildings, would somewhat reduce its legibility as a station entry. However, it is expected that design of this building, and use of signage would assist in identifying the station entry and assist in wayfinding.

The new eastern entry would be at street level, and include a generous entry forecourt. This contemporary structure would increase the comfort and amenity for customers.

The station would be located amongst an area with street level activation from the adjacent retail and restaurants, and adjacent CBD and South East Light Rail stop. The eastern entry would increase pedestrian activity in this area, and provide a well-lit and clearly visible entry point, improving surveillance and the perception of safety.

The loss of the heritage listed Bounce Hostel building would reduce the heritage character and reduce the vibrancy, diversity and legacy of this streetscape.

It is expected that the improvements and reduction in landscape quality would balance and overall there would be a no perceived change in the landscape quality at the eastern entry. As Randle Lane and Chalmers Street includes receivers of neighbourhood and local sensitivity respectively, this would result in a **negligible** landscape impact during operation.

## Assessment of daytime visual impact

### Selection of representative viewpoints

The proposed modification requires revisions to the assessment of viewpoints contained within the Environmental Impact Statement and the Preferred Infrastructure and Submissions Report including:

- Viewpoint 2: View south from platform 16
- Viewpoint 3: View west from Chalmers and Devonshire Streets
- Viewpoint 5: View west from Prince Alfred Park
- Views from the rail corridor
- Viewpoint 9: View north from platform 16
- Views from residential properties on Regent Street
- Viewpoint 10: View south from platforms 20/21 (and 22/23).

There would be no changes to viewpoints to the northern concourse (Viewpoint 1), views from Chalmers Street, north of Devonshire Street, (Viewpoint 4), views to the Sydney Yards Access Bridge (Viewpoints 6, 7, and 8), and views to power upgrade works.

Furthermore, the following additional viewpoints have been identified to illustrate the additional potential visual impacts of the proposed modification. These are:

- Viewpoint 11: View southwest along Randle Lane
- Viewpoint 12: Views northeast along Chalmers Street
- Viewpoint 13: Views from residential areas on Chalmers Street and Randle Lane
- Viewpoint 14: View west from the Devonshire Street station entry.

The location of these viewpoints is provided in Chapter 16 of the modification report.

There are no existing views of the east concourse and therefore a visual impact assessment is not required for this area. Furthermore, there are some minor works proposed for platform 4/5 and within the Sydney Yards which are not considered to warrant specific viewpoints due to the minor nature of these works.

This assessment should be read in conjunction with the viewpoints assessed in the Environmental Impact Statement and the Preferred Infrastructure and Submissions Report.

## Viewpoint 2: View south from platform 16



*The following is an update of the assessment of visual impact from the assessment for the approved project, incorporating an assessment of the proposed Central Walk modification.*

Viewpoint 2: View south from platform 16	
<b>Existing view</b>	This view from platform 16 shows the adjacent regional platforms and Sydney Yards in the middle to background of the view. A collection of heritage buildings and trees, located within the rail yards, partly obstruct views to the Yards from this location. The platforms and platform shelters, trains and overhead line infrastructure create a visually diverse and cluttered environment. Despite the visual clutter this view is unified by the parallel lines of the platform, tracks, overhead lines and gantries.
<b>View during approved project construction</b>	This view would change due to the demolition of platforms 12, 13, 14 and 15, including platform canopies and overhead lines seen in the middle ground of the view. Site perimeter hoarding would be established, obstructing views to the west (right of view), and enclosing views to the south. Demolition of buildings and vegetation within the Sydney Yards site would be visible to the south, as the worksite extends southeast and the services building is constructed at the southern end of the reconstructed platform 15. It is unlikely that the Sydney Yards Access Bridge would be visible due to distance, intervening construction activity and overhead line infrastructure. If visible the Sydney Yards construction works would not be prominent and would be consistent in character with the construction activity seen on adjacent platforms.
<b>Visual impact with the proposed modification during construction</b>	<p>In addition, there would be services gantries, extending across the suburban and intercity lines, to the south of the platforms. These would be seen within the rail corridor amongst existing overhead lines and support structures. These elements would be largely absorbed into the visually cluttered character of the rail yards. There would also be minor works along the platform, to regrade the platform level and replace the tiles.</p> <p>Overall, the project would create a noticeable reduction in the amenity of this view, which is of regional sensitivity, resulting in a <b>moderate adverse visual impact</b> during construction. This impact level is unchanged from the approved project.</p>



Viewpoint 2: View south from platform 16	
View during approved project operation	Upon completion of the approved project works, the platforms and platform canopies to the west of the view would have been reconstructed, extending further south and including a services building (approximately seven metres high) on the southern end of the platform. The overhead lines and tracks, directly adjacent to the view for the former platform 15, would have been removed and would not be replaced. This would restore the character of the existing view, and the prominence of the station platform buildings and skyline features within the view.
Visual impact with the proposed modification during operation	The services gantry would continue to be seen to the south of the intercity platforms, within the context of the visually cluttered rail corridor. The platform in the foreground of this view would have been refreshed with new tiles, paint and furnishings. Overall, it is expected that the project would not create a perceived change in the amenity of this view, resulting in a <b>negligible visual impact</b> during operation. This impact level is unchanged from the approved project.

### Viewpoint 3: View west from Chalmers and Devonshire Streets



*The following is an update of the assessment of visual impact from the assessment for the approved project, incorporating an assessment of the proposed Central Walk modification.*

Viewpoint 3: View west from Chalmers and Devonshire Streets	
Existing view	This view includes the Devonshire Street entry to Central Station and the Devonshire Street Tunnel in the middle ground of the view. The heritage Railway Institute building can be seen to the south (left of view) and station platforms are visible to the north (right of view). The Central Station clock tower, an important visual landmark, is visible and seen within a CBD skyline view. Along the eastern edge of the station the trees of the Plaza Iberoamericana obstruct views to the station platforms. This view would be transformed as the CBD and South East Light Rail project introduces a light rail corridor to Devonshire Street which would cross this view as it passes to the north and along Chalmers Street, where a transport interchange will be constructed adjacent to Central Station.
View during approved project construction	It is unlikely that the project works would be visible in areas adjacent to Chalmers Street (right of view). As such, views to the Central Station clock tower would continue to be seen rising above the station in the background. There may be some glimpses to the construction activity in the vicinity of the southern platform between the Devonshire Street station entry and Rail Institute building (left of view). This would include the removal of trees and buildings in the background of the view, obstructed by trains and filtered through overhead lines on the suburban train network. The character of this view would change to the north east of the view to include the construction works of the CBD and South East Light Rail project.

Viewpoint 3: View west from Chalmers and Devonshire Streets	
Visual impact with the proposed modification during construction	<p>Construction works would be visible at the station, adjacent to Chalmers Street (right of view). This would include the removal of a section of the heritage brick wall, and works on the suburban platform to construct the vertical transport elements of the east concourse and the removal of sections of the platform canopies. This work would not obstruct the existing view to the Central Station clock tower in the background. This construction would be seen at a distance and comprise a small portion of this view.</p> <p>There may also be some glimpses to the construction activity in the vicinity of the Devonshire Street station entry and Rail Institute building (left of view) for construction of the services route, including a gantry structure within the rail corridor. This work would be largely absorbed into the existing character of the rail corridor.</p> <p>Overall, the project would create a noticeable reduction in the amenity of this view, which is of local sensitivity, resulting in a <b>minor adverse visual impact</b> during construction. This impact level is increased from the approved project due to the additional areas of construction activity.</p>
View during approved project operation	<p>There would be no project works visible from this location during operation of the approved project.</p>
Visual impact with the proposed modification during operation	<p>The brick station perimeter wall would have been reinstated, and the suburban platform upgrades and vertical transport elements of the east concourse would be visible in the background of this view. These elements would be absorbed into the existing character of the station and not obstruct the important view of the Central Station clock tower. The gantry structure would have been removed and no elements of the services route would be visible.</p> <p>There would not be a perceived change in the amenity of this view, which is of local sensitivity, resulting in a <b>negligible adverse visual impact</b> during operation. This impact level is consistent with the approved project.</p>



## Viewpoint 5: View west from Prince Alfred Park



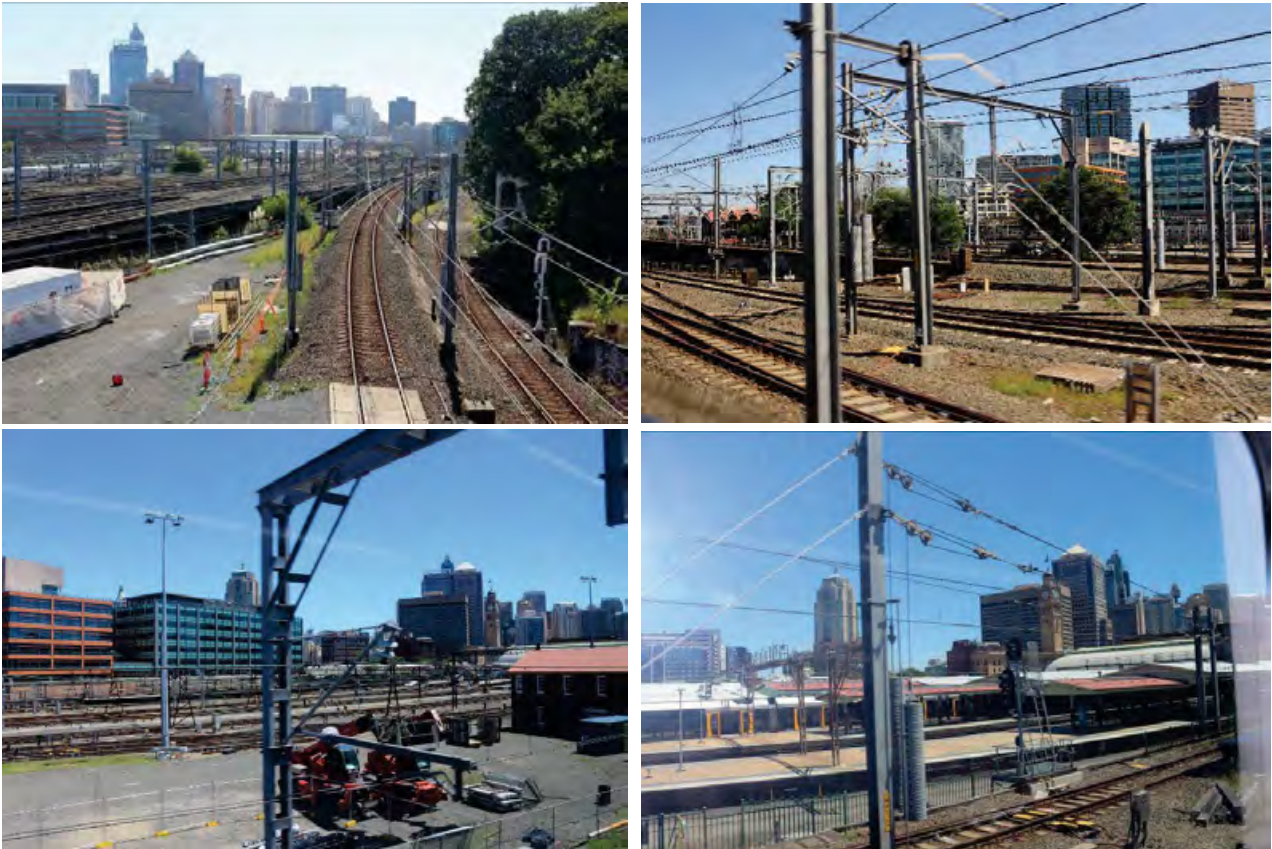
*The following is an update of the assessment of visual impact from the assessment for the approved project, incorporating an assessment of the proposed Central Walk modification.*

Viewpoint 5: View west from Prince Alfred Park	
<b>Existing view</b>	The Grand Concourse building and clock tower of Central Station can be seen in the middle to background of this view, framed by vegetation and aligned generally with a pathway leading from Cleveland Street at the south-eastern entry to the park. The lower levels of the station are seen filtered through intervening overhead lines and gantries, as well as the rail corridor safety fencing which sits atop a series of brick walls and encloses a basketball half court on the edge of the park. The visual prominence of the clock tower is diminished somewhat in this view by the backdrop of the CBD, which dwarf and absorb the structure into the background of this view. A similar view to this is identified by the City of Sydney in the Central Sydney Planning Strategy 2016-2036 (2016), Public views protection map.
<b>View during approved project construction</b>	Works within the station platform site, including construction of a services building, would be visible. The western extent of the Sydney Yard Access Bridge may also be seen, descending to meet the rail yards within the centre of the corridor. Due to the distance, intervening elements and existing visual context of the railyards, it is expected that the project would not create in a perceived change in the amenity of this view. This view is of regional sensitivity, resulting in a negligible visual impact during construction.



Viewpoint 5: View west from Prince Alfred Park	
Visual impact with the proposed modification during construction	It is unlikely that any construction activity associated with Central Walk would be distinguishable in this view. Any minor works would comprise a small portion of this view, and be viewed against a visually complex background which would largely absorb these changes. Overall, there would be no perceived change in the amenity of this view, which is of regional sensitivity. This would result in a <b>negligible visual impact</b> during construction. This impact level is unchanged from the approved project.
View during approved project operation	The completed Sydney Yard Access Bridge would continue to be seen in the background of the view, however, this would be largely visually absorbed into the surrounding rail corridor landscape. At the proposed metro platforms, there would be a services building rising above the platform level and obstructing views to the station platforms and lower level of the heritage station buildings beyond. Due to the distance, intervening elements, and retention of the open view to the clock tower, which is the focal point of this view, it is expected that the project would not create a perceived change in the amenity of views from this location. This view has a regional visual sensitivity, resulting in a negligible visual impact during operation.
Visual impact with the proposed modification during operation	It is not likely that Central Walk would be distinguishable from this location. Overall there would be no perceived change in the amenity of this view, which is of regional sensitivity. This would result in a <b>negligible visual impact</b> during operation. This impact level is unchanged from the approved project.

## Views from the rail corridor



*The following is an update of the assessment of visual impact from the assessment for the approved project, incorporating an assessment of the proposed Central Walk modification.*

### Views from the rail corridor

#### Existing view

In views for passenger on trains approaching Central Station from the south, the highly developed and broad rail corridor dominates the foreground. Elements within this corridor include moving trains, rail track and ballast, catenary structures and overhead lines, rail maintenance facilities and equipment. Numerous arched brick bridges ('flying junctions') raise and lower tracks to varying levels and obstruct some views within the corridor. Beyond the rail corridor, to the northwest there is a densely urban cityscape and to the southwest, is the leafy parkland of Prince Alfred Park, in Surry Hills.

There are several heritage buildings scattered within and surrounding the rail corridor, including Mortuary Station. Passenger on trains experience views to important heritage elements including Mortuary Station, building and the garden within Sydney Yards and the flying junctions. Several other historic buildings can be seen across the corridor, including the Rail Institute building on Chalmers Street and St Andrew's Greek Orthodox Church on Cleveland Street.

Views from the rail corridor	
View during approved project construction	<p>In the vicinity of the station the removal of platforms 12, 13, 14 and 15, a number of heritage buildings and vegetation within the corridor, storage of construction material and equipment would be visible from approaching trains. A construction site would be visible at the former location of platforms 12 to 15, enclosed by hoarding and including large plant and equipment. The construction of stairs on Platform 20/21 and 22/23 would be visible from trains at these and adjacent platforms.</p> <p>The construction of the Sydney Yards Access Bridge would be seen within the rail corridor to the southwest of the station buildings. This would include a worksite adjacent to the heritage listed Mortuary Station building, and include three cranes of 50 and 60 metres in height. This work would be visually prominent from most trains travelling to and from the south at ground level. The bridge would be a part of a series of views which create the journey to and from the station and would be seen whilst moving. The bridge would obstruct views within the corridor and to surrounding visual features, including Mortuary Station, St Andrew's Greek Orthodox Church, and the main Central Station building group and clock tower.</p> <p>Although the proposed changes to the construction of the Sydney Yards Access Bridge would be prominent in views from trains on adjacent rail lines, this construction and large cranes would be seen within a context of existing bridges, overhead line infrastructure and moving trains.</p>
Visual impact with the proposed modification during construction	<p>Central Walk would use the Sydney Yard construction site that will be established for the approved project. The visible construction works of Central Walk would be largely contained within the suburban platform areas, and these elements would not obstruct views to the main station buildings and clock tower from approaching trains.</p> <p>In views from trains approaching the suburban platforms from the north and south, the works on the suburban platforms would be seen at an oblique angle (out of the window of a train). Where visible, this work would include some construction activity along the platform and in the centre of the platform for the lift and escalators, seen in the background of the view, and filtered through platform infrastructure and obstructed by trains approaching the platforms.</p> <p>In views from trains approaching the city and interstate platforms an overhead services gantry would be constructed across the corridor, to the south of the suburban and intercity platforms (with a small section of trenching in platform 4/5). Visibility of the work at the suburban platforms would be largely obstructed by the construction compound at the Sydney Yard, and intervening rail infrastructure.</p> <p>Overall, these works would not be prominent in views from approaching trains, and would be absorbed into the existing complex view. There would continue to be a noticeable reduction in the amenity of views from the rail corridor, which are of regional sensitivity, resulting in a <b>moderate adverse visual impact</b> during construction. This impact level is unchanged from the approved project.</p>
View during approved project operation	<p>As a permanent structure, the Sydney Yard Access Bridge would be seen in views from trains as they approach and pass under the bridge. This structure would obstruct some views including glimpsed views to Mortuary Station, St Andrew's Greek Orthodox Church tower, and longer duration views to the main Central Station heritage buildings and clock tower on the southerly approach to the station. From some routes, however, existing bridge structures and level changes obstruct views to these local visual features and would also reduce the visibility of the Sydney Yards Access Bridge.</p> <p>In views from trains approaching the station from the south, the services building at the southern end of the metro platform would obstruct views to the station platforms, and from some locations, views to the main station buildings.</p>

Views from the rail corridor	
Visual impact with the proposed modification during operation	<p>In trains approaching the suburban platforms, views would include the decluttered and unobstructed views across the platforms where platform buildings and stairs are removed and replaced by lifts and escalators. On the approach to the intercity platforms, there would also be a permanent gantry visible extending across the rail corridor. These changes would not be prominent in these views, due to the angle and complex views to existing overhead line infrastructure, support structures, gantries, and station platform canopies. These elements would not obstruct views to the main station buildings or clock tower, where it can be seen. Overall, there would continue to be a noticeable reduction in the amenity of views from the rail corridor. These views are of regional visual sensitivity, resulting in a <b>moderate adverse visual impact</b> during operation. This impact level is unchanged from the approved project.</p>



Viewpoint 9: View north from platform 16



*The following is an update of the assessment of visual impact from the assessment for the approved project, incorporating an assessment of the proposed Central Walk modification.*

Viewpoint 9: View north from platform 16	
Existing view	This view from platform 16 shows the adjacent regional platforms set below the level of the suburban platforms aligned across the view. These platforms include canopies and lighting, seating, signage and advertising panels. There is also a two-storey building located on the northern end of the platform rising above the surrounding platform canopy. Above the platform canopies, glimpses of the heritage Central Electric Station building and Sydney Terminal building and clock tower can be seen in the context of the CBD skyline beyond. These heritage buildings, although not visible in their entirety, are integral to the historic character of the view. The platforms and platform canopies, and overhead line infrastructure contribute to the historic character of the view and with trains, create a visually diverse and cluttered foreground environment.
View during approved project construction	This view would change due to the demolition of platforms 12, 13, 14 and 15, including platform canopies and overhead lines seen in the middle ground of the view. The character of the view would change as site perimeter hoarding would be established and views to the west would be obstructed. Construction of the services building would be seen at the northern end of the reconstructed platform 14 (note, that platform 15 would no longer be in service). The heritage buildings would continue to be seen above the worksite, with some construction elements potentially filtering these views.

Viewpoint 9: View north from platform 16	
Visual impact with the proposed modification during construction	There would be minor works along the platform, to regrade the platform level and replace the tiles. These activities are unlikely to be seen by customers due to works being undertaken during rail possessions. As this construction activity would not be seen by customers, there would not be a perceived change in amenity due to the Central Walk works, and this would not change the impact identified for the approved project. Overall, there would be a noticeable reduction in the amenity of this view, which is of regional sensitivity, and a <b>moderate adverse visual impact</b> during construction.
View during approved project operation	The platforms and platform canopies to the west of the view would be reconstructed, and a services building would be seen under and rising one storey above the canopy on the northern end of the platform. This building would be generally in the same location as the existing services building on the platform and of a similar scale. The overhead lines and tracks alongside platform 15 would have been removed and would not be replaced. It not expected that the heritage buildings would be further obstructed by these elements and that visibility through to the adjacent platforms would be relatively unchanged.
Visual impact with the proposed modification during operation	In this view the platform would have been refreshed with new tiles, paint and furnishings. This would create a noticeable improvement in the amenity of this view, which is of regional sensitivity, and result in a <b>moderate beneficial visual impact</b> during operation. This impact has changed from the approved project as the platform upgrade works would improve the amenity of this view.

## Views from residential properties on Regent Street

*The following is an update of the assessment of visual impact from the assessment for the approved project, incorporating an assessment of the proposed Central Walk modification.*

Views from residential properties on Regent Street	
Existing view	<p>Views from the rear windows, balconies and rooftop terraces of residential properties on Regent Street comprise broad expanses of the rail corridor, Sydney Yards and station precinct. These elements are seen in the fore, middle and background of these views. It is expected that the character of views from these properties includes a highly developed and broad rail corridor with elements including moving trains, rail track and ballast, catenary structures and overhead lines, rail maintenance facilities and equipment. Some of these views are filtered through architectural noise attenuating treatments whilst others are unobstructed. Construction and rail related maintenance activity is regularly occurring within these areas.</p> <p>Beyond the rail yards, the heritage buildings of Central Station would be visible, including the main station building, clock tower and platform canopy structures. Several other historic buildings may be seen around the station precinct, including the Rail Institute building on Chalmers Street, St Andrew's Greek Orthodox Church on Cleveland Street, and Mortuary Station also on Regent Street. Views would also include the leafy parkland of Prince Alfred Park, in Surry Hills, to the southeast. These complex views contain elements which both contribute to and detract from the character of views.</p>
View during approved project construction	<p>The establishment of a site within the rail corridor and use of three cranes, rising to 50 and 60 metres in height above the rail corridor level, would be visible unobstructed and in close proximity to the northeast of these properties. The construction of the Sydney Yard Access Bridge would be seen directly adjacent and to the east, rising from Regent Street and extending at an elevated level of approximately nine metres, across the rail yards and descending to the Sydney Yards at a distance of approximately 170 metres from Regent Street.</p>
Visual impact with the proposed modification during construction	<p>The construction of the services route, platform elements of the east concourse and suburban platform works would be seen in the background of views from residential properties on Regent Street. These elements would be filtered by existing rail corridor elements, and seen in the context of the approved project construction activity, particularly construction of the Sydney Yards Access Bridge. This work would not further alter the amenity of these views. The impact would remain as identified for the approved project, which is a considerable reduction in the amenity of these views, which are of neighbourhood sensitivity, resulting in a <b>minor adverse visual impact</b> during construction.</p>
View during approved project operation	<p>The Sydney Yard Access Bridge would be seen in the fore and middle ground of views from these properties. The impact would be greater at lower levels where some direct obstruction of the view may be experienced, however, in views from elevated windows and balconies, the focal point of these views would once again become the background elements of the CBD skyline, main Central Station building and clock tower, and greenery of Prince Alfred Park.</p>
Visual impact with the proposed modification during operation	<p>Similarly, during operation of Central Walk these views would include the services route gantry over the intercity lines south of the platforms, and glimpses to the platform elements of the east concourse and suburban platform works. These elements would be seen in the background of these views, and obstructed by intervening elements within the rail corridor, including the Sydney Yards Access Bridge. These elements would not further alter the amenity of these views. The impact would remain as identified for the approved project, which is a considerable reduction in the amenity of these views, which are of neighbourhood sensitivity, resulting in a <b>minor adverse visual impact</b> during operation.</p>

## Viewpoint 10: View south from platform 20/21 (and 22/23)



*The following is an update of the assessment of visual impact from the assessment for the approved project, and a similar additional viewpoint, incorporating an assessment of the proposed Central Walk modification. The additional viewpoint has been incorporated as it better shows the potential visible elements of Central Walk.*

Viewpoint 10: View south from platform 20/21 (and 22/23)	
<b>Existing view</b>	Views south along platforms 20/21 and 22/23 are enclosed by canopies with twin supporting columns. The brick tiled platform includes furnishings including seating, signage and advertising panels, there is overhead line infrastructure as well as trains arriving to the east and west, creating a visually diverse and cluttered environment. Despite this clutter, this view is unified by the repetition of parallel lines created by these elements.
<b>View during approved project construction</b>	A construction site would be visible, located centrally within the northern area of the platform. This site would contain the works required to construct stairs descending below both Platform 20/21 and 22/23. This worksite would only comprise a short section of the overall platform length, and the remainder of the platform would remain in use.



Viewpoint 10: View south from platform 20/21 (and 22/23)	
Visual impact with the proposed modification during construction	During possessions and after hours, there would be a temporary construction site established in the middle ground of this view, this would include works to construct the lift structures and escalators. The station platform buildings would be demolished, and a section of the platform canopy would be removed to allow for construction of the lift structure. There would also be minor works along the platform, to regrade the platform level and replace the tiles. These activities would not be seen by customers as this work would be undertaken during temporary possessions. During platform operations, there would be temporary floor plates, used to seal the worksite, visible in place of these works and altering the character of the platform surface. The introduction of floor plates on the platform, and minor construction works on the platform, near customers, would alter the character of this view. Overall this would create a noticeable reduction in the amenity of this view, which is of regional sensitivity. This would result in a <b>moderate adverse visual impact</b> during construction.
View during approved project operation	Temporary stairs would be seen descending below both Platform 20/21 and 22/23 and would be consistent in character with the stairs located on adjacent platforms.
Visual impact with the proposed modification during operation	In the middle ground of this view there would be escalators descending, to the east concourse, and a lift structure beyond. The platform would have been refreshed with new tiles, paint and furnishings. The works would comprise a large area of the view, creating a noticeable improvement in the amenity of this view, which is of regional sensitivity. This would result in a <b>moderate beneficial visual impact</b> during operation.

## Viewpoint 11: View southwest along Randle Lane



*The following is an assessment of an additional viewpoint to those assessed for the approved project, to assess the potential visible elements of Central Walk.*

Viewpoint 11: View southwest along Randle Lane	
Existing view	Views along Randle Lane are narrow and contained by the surrounding built form of two to eight stories. In the middle ground of the view, Randle Lane bends, so that a couple of residential buildings are seen in the centre of the view. The rear elevation of the building at 20-28 Chalmers Street is seen along the lane to the west (right of view) and is mostly obstructed by the Sydney Dental Hospital building to the north (right of view) and is foreshortened by the angle of view. Randle Street is narrow, accommodating some parking and mainly service entries at street level.
Visual impact with the proposed modification during construction	Midway along the lane, the demolition of the Bounce Hostel building and establishment of a construction site would be seen. This construction site would include works elevated above the street level on a platform, and at times this work would extend across the lane for excavation activity. Construction vehicles would be seen accessing the site along Randle Lane. The works would comprise a small portion of this view, seen in the middle ground of this view, and largely enclosed by surrounding built form. Overall there would be a noticeable reduction in the amenity of this view, which is of neighbourhood sensitivity. This would result in a <b>negligible visual impact</b> during construction.

Viewpoint 11: View southwest along Randle Lane	
Visual impact with the proposed modification during operation	<p>The four-storey Bounce Hostel (former MGM building) (local heritage item) at 20-28 Chalmers Street would be replaced with the new eastern entry building, of a similar height and scale to the adjacent Sydney Dental Hospital building annex (approximately two storeys). Facing Randle Lane, the building would have a blank facade with service entry and fire stair. The lane would be reinstated and adjacent buildings would be retained. Although a locally listed heritage building would be removed, the narrow lane limits the visibility of Central Walk, which would have a character consistent with the character of the lane. This change would create a noticeable reduction in the amenity of this view. This is a view of neighbourhood sensitivity, resulting in a <b>negligible visual impact</b> during operation.</p>

## Viewpoint 12: View northeast along Chalmers Street



*The following is an assessment of an additional viewpoint to those assessed for the approved project, to assess the potential visible elements of Central Walk.*

### Viewpoint 12: View northeast along Chalmers Street

<p><b>Existing view</b></p>	<p>This view along Chalmers Street includes Central Station to the west (left of view), bounded by brick walls with inlaid art panels. The canopy of platform 23 is visible over the wall and the CBD skyline can be seen above the station in the background of the view. In the centre middle ground of the view, is a wide asphalt footpath which includes scattered London plane trees and a double row of light poles. Chalmers Street is four lanes wide in this area, including two lanes of on street parking. To the east (right of view) the street includes built form rising between six and ten stories. This includes a dental hospital in the north, residential and hotel accommodation with bars and cafes at street level to the south.</p> <p>The central areas of this view would be transformed as the trees along Chalmers Street are removed for construction of the CBD and South East Light Rail and a light rail corridor and stop and separated cycleway are established on Chalmers Street.</p>
<p><b>Visual impact with the proposed modification during construction</b></p>	<p>The demolition of the Bounce Hostel building and establishment of a construction site would be seen in the middle ground of this view (right of view). This construction site would include works elevated above the street level on a platform, and at times this work would extend across the footpath on the eastern side of Chalmers Street. Part of the brick wall along the western side of Chalmers Street would be dismantled and a part of the shared path would be closed to the public until the wall is reinstated, with temporary fencing or site hoarding. The works would comprise a small portion of this view, and be seen in the middle ground. Overall there would be a noticeable reduction in the amenity of this view, which is of local sensitivity. This would result in a <b>minor adverse visual impact</b> during construction.</p>



#### Viewpoint 12: View northeast along Chalmers Street

##### Visual impact with the proposed modification during operation

Chalmers Street will be transformed by CBD and South East Light Rail, including:

- A new stop in Chalmers Street
- New footpaths on both sides of the light rail corridor as well as a dedicated cycleway on the east side of the street
- Removal of vehicle parking and access with a cul-de-sac in the foreground on this view.

As part of Central Walk, the four storey, local heritage listed Bounce Hostel at 20-28 Chalmers Street would be replaced with the new eastern entry. It would be a two storey development with future over station development potential (not a part of Central Walk and subject to separate assessment and approval). The entrance would be visible beyond the light rail and consist of a street level entry concourse with escalators and lifts. Adjacent buildings would be retained. Although a locally listed heritage building would be removed, the eastern entry would be of a similar height and scale to adjacent Dental Hospital Building annex, and therefore consistent with the varied scale of built form in this view. This would result in no perceived change in the amenity of this view, which is of local sensitivity, resulting in a **negligible visual impact**.

## Viewpoint 13: Views from residential areas on Chalmers Street and Randle Lane



*The following is an assessment of an additional viewpoint to those assessed for the approved project, to assess the potential visible elements of Central Walk.*

Viewpoint 13: Views from residential areas on Chalmers Street and Randle Lane	
Existing view	There are a number of residential properties located on Chalmers Street and Randle Lane. This includes three 7-8 storey residential buildings which would have views across Central Station and to the CBD skyline, filtered through trees on Chalmers Street. These views would be altered as the street trees are removed for the construction of the CBD and South East Light Rail project, and a light rail corridor and stop along Chalmers Street are established.
Visual impact with the proposed modification during construction	Residential properties on Randle Lane and Chalmers Street, adjacent to the site, may have close proximity views to the demolition of the Bounce Hostel building and construction works from overlooking windows and building entries. This construction site would include works on a platform elevated above the street level, and at times this work would extend across Randle Lane, towards the residential properties with windows opening onto the lane. Construction vehicles would also be seen accessing the site along the lane. The site would extend across the footpath on Chalmers Street, and would be visible from residential properties on Chalmers Street with windows oriented towards the site. It is not expected that this work would obstruct any existing views to the Central Station clock tower and main station buildings or CBD skyline views. Overall there would be a considerable reduction in the amenity of views from adjacent residential buildings, which are of neighbourhood sensitivity. This would result in a <b>minor adverse visual impact</b> during construction.
Visual impact with the proposed modification during operation	The four storey Bounce Hotel building (local heritage item) at 20-28 Chalmers Street would be replaced with the new eastern entry, a two storey development with future over station development potential (not a part of Central Walk and subject to separate assessment and approval). The entrance would be visible from nearby residential and commercial properties. There may be some views across Chalmers Street and to the station opened-up by the removal of the building, and replacement with a lower height structure. Although the character of the locally listed heritage building would be lost, the eastern entry would be of a similar height and scale to surrounding built form, resulting in no perceived change in the amenity of this view. It is a view of neighbourhood sensitivity, resulting in a <b>negligible visual impact</b> .

## Viewpoint 14: View west from the service access at the eastern station entry



*The following is an assessment of an additional viewpoint to those assessed for the approved project, to assess the potential visible elements of Central Walk.*

Viewpoint 14: View west from the service access at the eastern station entry	
Existing view	Views along this service entry include the rail corridor in the centre of the view, with moving trains, overhead line support structures and lines, and perimeter security fencing. The Sydney Yards can be seen (blocked by train in this image) and will include activity required for construction of the approved project. To the north (right of view) the Devonshire Street station entry building can be seen, with a sandstone base, glazing, and an elevated roof structure. Beyond this, existing brick walls extend the line of the building. To the south (left of view) the decorative brick façade of the Railways Institute building adds a heritage character to this view.
Visual impact with the proposed modification during construction	A shaft would be constructed behind the Devonshire Street entry building, requiring the removal of a section of brick wall. A gantry structure would be constructed, extending to the west, away from the view. This gantry would be consistent in character to the adjacent overhead line support structures and be generally absorbed into the rail corridor character seen in the middle and background of this view. These works would not result in a perceived change in the amenity of this view, which is of local sensitivity. This would result in a <b>negligible visual impact</b> during construction.
Visual impact with the proposed modification during operation	The gantry would be removed and there would be louvres for the ventilation shaft integrated into the Devonshire Street entry building. Overall there would be no perceived change in the amenity of this view, resulting in a <b>negligible visual impact</b> during operation.

## Assessment of night-time visual impact

Night-time visual impact	
Existing night-time setting	The setting of Central Station is an area of E4: High district brightness. It is a brightly lit urban area, with lighting from the heavily trafficked streets, surrounding buildings, transport interchanges and station creating both direct light sources and a general skyglow around the Central Walk site.
Night-time setting during approved project construction	There would be night works required at Central Station during construction of the approved project, including 24 hour deliveries and spoil haulage. The construction site would be largely contained within the station and not likely to be overlooked by surrounding streets, residential properties or hotels. This lighting would be generally consistent in character with the brightly lit station area. However, from works associated with the Sydney Yards Access Bridge, however, it is expected that there would be an increase in visible lighting, light spill and skyglow seen from adjacent residential properties. This increase in lighting would occur during rail possessions when 24-hour construction activity would be undertaken within the rail corridor and cranes would be in use.
Night-time impact with the proposed modification during construction	<p>The Sydney Yard construction site would be largely contained within the station, and not likely to be overlooked by surrounding streets, residential properties or hotels. This lighting would be generally consistent with the brightly lit station area. Similarly, night works undertaken in underground areas would be contained and not be seen from surrounding areas.</p> <p>The eastern entry construction site, established on the Bounce Hostel site between Chalmers Street and Randle Lane, would however be overlooked by adjacent residential buildings. Following demolition of the Bounce Hotel building, there would be some lighting required as this site is used to access underground site areas. There may also be limited haulage at night via Randle Lane introducing additional lighting from these vehicles. The lighting associated with this activity may result in some additional sky glow and direct light sources seen from adjacent residential windows.</p> <p>Overall, it is expected that due to the potential impacts from residential areas on Randle Lane and Chalmers Street, there would be a noticeable reduction in the amenity of views in this area, which would result in a <b>negligible visual impact</b> during evening hours. This impact level is unchanged from the approved project.</p>
Night-time setting during approved project operation	Lighting associated with the project would be consistent with the high district brightness environment of the existing station. There would be lighting on the proposed Sydney Yards Access Bridge, however, this would be inconspicuous and avoid light spill onto Mortuary Station, adjacent residential and public domain areas. It is not expected that there would be frequent night time access to the Sydney Yard via the Sydney Yards Access Bridge. In views from the rail corridor, the lighting would be designed so as not to distract drivers.
Night-time impact with the proposed modification during operation	The new eastern station entry would be brightly lit, as would the areas within the station. At the eastern entry, it is expected that there may be some light spill onto the surrounding footpaths, streets and potentially onto adjacent private residential properties. However, this would be consistent with the brightly lit environment of the station and urban setting of an area of high district brightness, it is expected that there would be a noticeable reduction in the amenity of views from any affected private residential properties in the vicinity of Randle Lane. Due to the low sensitivity of the area of E4: High district brightness, the project with Central Walk would not create a perceived change in visual amenity, resulting in a <b>negligible visual impact</b> for this area during evening hours. This impact level is unchanged from the approved project.



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CHATSWOOD TO SYDENHAM  
**CENTRAL WALK MODIFICATION REPORT**