Metro Body of Knowledge

Planning Approval Consistency Assessment Form

SM-17-00000111

Sydney Metro – Metro Body of Knowledge (MBoK)

Assessment Name:	Operational assessment of tunnel alignment between The Bays and Sydney CBD
Prepared by:	Sydney Metro
Prepared for:	Sydney Metro
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1. Existing Approved Project

Planning approval reference details (Application/Document No. (including modifications)):			
SSI-22765520: Sydney Metro West – Major civil construction between Rail infrastructure, stations, precincts and operations (Stage 3 of the planning approval process for Sydney Metro West)			
Date of determination:	Stage 3 – 26 January 2023	**Type of planning approval:**	Critical State Significant Infrastructure (CSSI) (Division 5.2)

Relevant background information (including EA, REF, Submissions Report, Director General's Report, MCoA):

Sydney Metro West is a staged infrastructure application under Section 5.20 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This Consistency Assessment (SMW08) assesses the operational aspects of changes to the station and tunnel features for consistency against Sydney Metro West (*Environmental Impact Statement for Rail infrastructure, stations, precincts and operations*) (Stage 3 of the planning approval process for Sydney Metro West).

The construction related impacts (tunnelling and excavation) of these changes have already been assessed against the previous planning approval (*Sydney Metro West – Major civil construction between The Bays and Sydney CBD* (SSI-19238057) (Stage 2) in the endorsed Consistency Assessments SMW05, SMW07 and SMW11.

There are no additional design changes proposed as part of this consistency assessment.

This Consistency Assessment (SMW08) is relevant to the following planning approval documentation:

- *Sydney Metro West Environmental Impact Statement – Rail infrastructure, stations, precincts and operations* (Sydney Metro, March 2022) (referred to throughout this document as 'the EIS')
- *Sydney Metro West Submissions Report – Rail infrastructure, stations, precincts and operations* (Sydney Metro, August 2022)
- *Sydney Metro West Stage 3 – Assessment Report (SSI-22765520) (*26 January 2023*)*

All proposed work identified in this Consistency Assessment would be carried out in accordance with the mitigation measures identified in the *Sydney Metro West Environmental Impact Statement – Rail infrastructure, stations, precincts and operations* (Stage 3 of the Planning Approval), Submissions Report and the Conditions of Approval (CoA).

Description of existing Approved Project you are assessing for consistency:

Sydney Metro West (the Concept)

Sydney Metro West (the Concept) would involve the construction and operation of a metro rail line around 24 kilometres long between Westmead and Hunter Street in the Sydney central business district (CBD). The key components are expected to include (as described in Chapter 6 of the Environmental Impact Statement (EIS)):

- Construction and operation of new passenger rail infrastructure between Westmead and the CBD of Sydney, including:
    - Tunnels, stations (including surrounding areas) and associated rail facilities

    - Stabling and maintenance facilities (including associated underground and overground connections to tunnels)
- Modification of existing rail infrastructure (including stations and surrounding areas)
- Ancillary development.

Sydney Metro West – all major civil construction work between Westmead and The Bays (Stage 1)

Sydney Metro West – Concept and Stage 1 (major civil construction between Westmead and The Bays), including station excavation and tunnelling, was determined on 11 March 2021.

It is noted that this Consistency Assessment does not relate to any aspects of Stage 1.

Sydney Metro West – all major civil construction work and tunnelling between The Bays and Sydney CBD (Stage 2)

The major civil construction work between The Bays and Sydney CBD was determined on 24 August 2022. The scope of the Approved Project is described in Chapter 5 of the EIS and includes:

- Enabling work such as demolition, utility supply to construction sites, utility adjustments, and modifications to the existing transport network
- Tunnel excavation including tunnel support activities
- Station excavation for new metro stations at Pyrmont and at Hunter Street, in the Sydney CBD.

The Consistency Assessments SMW05, SMW07 and SMW11 relate to the works carried out under the Stage 2 planning approval. This Consistency Assessment (SMW08) assesses the operational impacts of these previously approved tunnel alignment and tunnel features design refinements. Impacts resulting from construction (tunnelling and excavation) have therefore previously been assessed against the Stage 2 planning approval in the endorsed Consistency Assessments SMW05, SMW07 and SMW11.

Sydney Metro West – Rail infrastructure, stations, precincts and operations (Stage 3, The Approved Project)

The Sydney Metro West - Rail infrastructure, stations, precincts and operations was determined on 25 January 2023. The proposal includes construction elements relating to the tunnel fit-out, construction of stations, ancillary facilities and station precincts, as well as the operation and maintenance of the Sydney Metro West line.

Construction activities that will be carried out as part of the Stage 3 planning approval include:

- Enabling and site establishment work
- Construction of stations and structures for non-station use (e.g. Retail, commercial and/or community facilities)
- Station fit-out
- Station precinct and interchange work including provisioning for over and/or adjacent station development, where relevant
- Construction and fit-out of the stabling and maintenance facility and services facility
- Tunnel fit-out and rail systems work
- Finishing work, testing and commissioning.

This is the relevant planning approval subject of this Consistency Assessment.

Tunnel construction methodology and operations for Stage 3

Tunnel fit-out work during construction and operation of the metro rail tunnels were assessed in the *Sydney Metro West Environmental Impact Statement – Rail infrastructure, stations, precincts and operations* (Stage 3 of the Planning Approval).

Construction

Fit-out of the tunnels will occur up to 24 hours per day and seven days per week. The EIS identified that as these works will occur underground and are relatively minor in nature, potential impacts such as construction noise and vibration, and potential impacts to heritage items, would be negligible.

An overview of activities that comprise tunnel fit-out and rail systems work is provided in Table 6-1 of the EIS, including:

- fresh air tunnel ventilation fit-out
- track slab and rail fastening
- rail track installation
- cable and equipment installation
- installation of other equipment, such as power structures, lighting, drainage and fire and life safety systems.

Operation

As identified in the EIS, operational activities would be largely confined to the underground operation of metro trains. Appropriate track form will be implemented so that ground-borne noise and vibration from the operation of metro trains in the tunnels would comply with the applicable criteria. The Sydney Metro West alignment will also include turnbacks in the Sydney CBD, crossover points at various points along the alignment and stub tunnels at the western and eastern extents of the tunnels.

Construction and operational site footprints for Stage 3

Surface and below ground site footprints for construction and operation were assessed in the *Sydney Metro West Environmental Impact Statement – Rail infrastructure, stations, precincts and operations* (Stage 3 of the Planning Approval).

The indicative Sydney Metro West alignment between Westmead and Hunter Street (Sydney CBD) is shown in Figure 1-3 to Figure 1-10 in Appendix B – Revised proposal description in the Submissions Report.

2. Description of proposed change which is the subject of this assessment

The purpose of this Consistency Assessment is to assess several key design changes to the overall tunnel alignment and tunnel features against the Approved Project (Stage 3). All changes covered by this Consistency Assessment have been assessed for consistency against the previous stage of the CSSI (Stage 2), for major excavation works and tunnelling between The Bays and Sydney CBD, and were assessed in Consistency Assessments SMW05, SMW07 and SMW11.

Sydney Metro West has previously engaged with stakeholders and the community regarding changes to the tunnel alignment when they were initially assessed against the planning approval for major excavation works and tunnelling between The Bays and Sydney CBD (Stage 2). This included engagement with residents and businesses impacted by minor changes to the tunnel alignment and tunnel features, including the relocation of the crossover cavern in Pyrmont and the permanent undercut at Hunter Street Station east. Engagement included doorknocks, phone calls and/or emails, a community drop-in session and email distribution.

The major excavation and tunnelling works associated with these changes therefore do not form part of this Consistency Assessment. This Consistency Assessment only relates to the fit-out, testing and commissioning and operations of the revised Sydney Metro West tunnel alignment and configuration assessed in SMW05, SMW07 and SMW11including:

- **Tunnel realignment between The Bays and Hunter Street (tunnelling works previously assessed under Consistency Assessment SMW05, SMW07 and SMW11)**
    - Minor realignment of twin tunnels between Pyrmont Station (east) and Darling Harbour
    - Minor realignment of twin tunnels east of the Hunter Street station site (terminating beneath The Domain)
    - Reduction to the tunnel depth by about four meters from Hunter Street station eastern site to the turnback tunnel beneath the domain
    - Reconfiguration of the turnback stub tunnel beneath The Domain.

  Major excavation and tunnelling for the above works were assessed for consistency against the previously Approved Project (Stage 2) in Consistency Assessment SMW05, SMW07 and SMW11. The proposed change to the tunnel alignment is entirely underground. The full proposed tunnel realignment is shown in Attachment A of this Consistency Assessment. The greatest change across the alignment is at Blackwattle Bay, where the tunnel alignment would move about 16 metres south of the indicative tunnel alignment assessed in the Approved Project. The depths of the tunnels would be similar to those assessed for the approved project. For the alignment between the Hunter Street Station eastern site and the turnback stub tunnels beneath The Domain, the depth of the tunnels would be reduced by between one to four metres. The greatest depth change would occur at the turnback stub tunnels beneath The Domain. The revised tunnel alignment is shown in Appendix A.
- **Crossover cavern at Pyrmont (tunnelling works previously assessed under Consistency Assessment SMW07)**
    - Relocation of the crossover cavern from The Bays Station (east of The Bays Station box) to the western end of Pyrmont Station. This involves a minor realignment of the tunnels at Pyrmont Station to achieve a crossover in-line and at grade with the future station platforms
    - Minor reduction to the vertical alignment through Pyrmont to accommodate the crossover cavern, similar to the depth of the tunnel alignment assessed in the Approved Project.

  The realignment of the tunnels were previously assessed for consistency against the previously Approved Project (Stage 2) in Consistency Assessment SMW07 and there would be no further change to the tunnel alignment.
- **Permanent undercut at Hunter Street eastern site (tunnelling works previously assessed under Consistency Assessment SMW05)**
    - Fit-out and use of a permanent undercut on Hunter Street, Sydney CBD (beneath the road reserve).

  These tunnelling and excavation works were previously assessed for consistency against the Approved Project (Stage 2) in Consistency Assessment SMW05 where it was assessed that a permanent undercut would be located partially outside the Approved Project corridor, under the Hunter Street road reserve, as shown in Attachment B. The undercut would allow for sufficient space within the operational footprint of the station for vertical transport (i.e. escalators) for customers.

Table 1 - Comparison of the proposal with relevant elements of the Approved Project (Tunnel realignment between The Bays and Hunter Street)

Relevant elements of the Approved Project	Proposed change
Turnback stub	As assessed in Consistency Assessment SMW05, the revised location of the

Section 1.3 of the Revised Proposal Description of the RtS identifies that Sydney Metro West would include turnback stubs at Westmead and in the Sydney CBD. The stub tunnels would be located at the western and eastern extents of the tunnels to safeguard for potential future extensions. Figure 1-10 of the Revised Proposal Description shows the configuration of the turnback stub.	turnback stub tunnel would be slightly south of the turnback stub tunnel, as shown in Figure 1-10 of the Revised Proposal Description of the RtS. The turnback stub tunnel would be reconfigured from two tunnels to one tunnel and would be shortened by around 300 metres. The amalgamation of tunnels will result in the new single tunnel being longer in length than the configuration used in the Approved Project but would still fit within the EIS corridor study area.
Tunnel alignment The indicative tunnel alignment for the approved project is shown in Section 1.3 of the Revised Proposal Description (Appendix B) of the RtS. Figures 1-9 and 1-10 show the indicative tunnel alignment between The Bays and Hunter Street Stations.	This Consistency Assessment includes the assessment of minor tunnel realignments between The Bays and Hunter Street Stations during fit out and operations. The minor realignments have previously been assessed for construction related impacts in Consistency Assessments SMW05, SMW07 and SMW11. The relevant sections of the approved tunnel alignment, and the revised tunnel alignment subject of Consistency Assessments SMW05, SMW07 and SMW11 is shown in Attachment A. The tunnel alignment is located entirely underground. There are no additional tunnel realignments proposed as part of this consistency assessment. The horizontal alignment would result in a maximum deviation of about 16 metres from the alignment assessed in the EIS. This would occur at the section of the alignment beneath Blackwattle Bay. The depths of the realigned tunnels would be similar to the indicative tunnel alignment in the EIS. The largest change is at Chifley Square, where the vertical alignment of the tunnels would be expected to reduced by one to four metres.
Construction hours Table 2-2 of the Revised Proposal Description of the RtS describes the construction hours for tunnel-related construction activities and rail systems fit-out. Activities to be undertaken 24 hours per day, seven days per week include: • Station and line-wide fit out (systems) • Station testing and commissioning • Rail systems fit-out • Rail systems testing and commissioning • Finishing, testing and commissioning. Activities to be undertaken during day-time hours (7am to 6pm Monday to Friday and 8am to 6pm Saturday) include: • Enabling and site establishment work	The proposed tunnel realignment would not change the construction hours of any construction activities to be undertaken as part of the Approved Project.

• Station construction • Station precinct and interchange work.	
Operational noise and vibration Noise and vibration are assessed in Technical Paper 3, and Section 16.4.2 of the EIS. Airborne and ground borne noise and vibration are expected to be compliant with the applicable criteria for all receivers with the use of Scenario 2 track form (Type 2 and Type 1A) along the whole alignment, with the exception of a 330 m section of Type 3A IST under recording studios in Pyrmont. Section 16.1.1 of the EIS says that appropriate track form would be implemented so that ground-borne noise and vibration from the operation of metro trains in the tunnels would comply with the applicable criteria.	As the tunnel realignment is minor and still within the study area of the EIS of the Approved Project, operational noise and vibration impacts are not expected to change. The appropriate track form would be confirmed during design development in accordance with REMM EIS-NV3 and the relevant Conditions of Approval, to ensure the relevant ground-borne noise and vibration criteria can be met. Refer to Section 11 for the operational noise and vibration assessment.
Groundwater Groundwater is assessed in Section 15.10 of the EIS. There is not anticipated to be any soils, groundwater or contamination impacts during operation of the tunnels. The influence of the tunnel on the overall groundwater levels and regional flow patterns are expected to be negligible as the tunnel would be tanked (to prevent the inflow of groundwater) as part of the work carried out under the previous Sydney Metro West planning applications.	There is no change to the construction methodology as a result of the tunnel realignment. Tunnels will be tanked to prevent the inflow of groundwater during operation and as such, there is expected to be no change to groundwater impacts during operation as a result of the tunnel realignment.

Table 2 - Comparison of the proposal with relevant elements of the Approved Project (Relocation of the crossover cavern from The Bays to Pyrmont)

Relevant elements of the Approved Project	Proposed change
Tunnel features Section 5.3 of the EIS describes that crossover points would be provided at various points along the alignment. Figure 5-10 shows the indicative track configuration for Sydney Metro West which includes a crossover cavern at The Bays Station.	Consistency Assessment SMW07 assessed the relocation of the crossover cavern from The Bays Station to the western end of Pyrmont Station. There would be no further changes to the revised location of the crossover cavern as a result of this Consistency Assessment.
Operational noise - Track type Noise and vibration are assessed in Technical Paper 3 and Section 16.4.2 of the EIS from the Approved Project. The noise impacts for both the eastern and western sites at Pyrmont were predicted to comply with the design noise criteria during the daytime and evening period with the exception of minor non-compliances of the amenity target level during the night-time. The assessment modelled three scenarios of track types to determine the most appropriate application across the alignment:	The operational noise and vibration impacts as a result of the tunnel realignment are not expected to change. Additionally, the noise impacts for Pyrmont are predicted to comply with the design noise criteria. The appropriate track form would be confirmed during design development in accordance with REMM EIS-NV3 and the relevant Conditions of Approval, to ensure the relevant ground-borne noise and vibration criteria can be met.

• Scenario 1 – Standard Attenuation Type 1 track form throughout tunnelled alignment • Scenario 2 – High Attenuation Type 2 track form throughout with the exception of Type 1A (slightly lower stiffness than Type 1) over crossovers due to track performance requirements at these locations. • Scenario 3 – Very High Attenuation Type 3A track form throughout tunnelled alignment. The assessment found that a combination of the three track forms across the alignment would be the most suitable outcome to achieve compliance with the relevant noise and vibration guidelines and minimise impacts on nearby receivers.	An Operational Noise and Vibration Review would be required to be prepared during detailed design in accordance with CoA E49 to confirm the appropriate track attenuation type required to meet the design noise objectives for ground-borne noise land uses. Within 12 months of the commencement of operation, monitoring of operational noise and vibration (including ground-borne noise) would be required under CoA E50, to compare actual noise and vibration performance against the predictions of the Operational Noise and Vibration Review. This would determine if any additional noise mitigation is required for operations of Sydney Metro West.

Table 3 - Comparison of the proposal with relevant elements of the Approved Project (Permanent undercut at Hunter Street eastern site)

Relevant elements of the Approved Project	Proposed change
Construction site footprint Section 15.8.1 of the EIS identifies that no additional footprint beyond that already assessed under the previous Sydney Metro West planning application is required for the Hunter Street Station (Sydney CBD) construction sites. The indicative construction site layout for the Hunter Street station eastern and western sites are shown in Figure 15-8.	The construction related impacts of this changes was assessed in Consistency Assessment SMW05. There are no additional design changes proposed as part of this Consistency Assessment. The additional shaft undercut extends outside the approved Hunter Street Station (Sydney CBD) construction site, and partially outside the Approved Project corridor. The undercut would be substratum, and the surface level footprint of the approved construction site would not change. This undercut would remain as a permanent excavation required to support the future planned operation of the station.
Station design Section 15.2.2 of the EIS states that at each site, escalators and/or stairs and lifts would provide access to an underground concourse level. Figures 15-2 and 15-3 shows the indicative layout and key design elements for Hunter Street station eastern and western sites.	The construction related impacts of this changes was assessed in Consistency Assessment SMW05. There are no additional design changes proposed as part of this Consistency Assessment. The additional shaft undercut would extend less than five metres below ground, under the Hunter Street road reserve as shown in Attachment B. The depth of the undercut would not exceed the depth of the station box and tunnels.

3. Timeframe

Tunnelling between The Bays and Sydney CBD (including the turnback stub) and excavation of the undercut at the Hunter Street eastern site would be undertaken as part of the previous planning approval for Sydney Metro West (Stage 2). The indicative construction program for the Approved Project (Stage 3) is described in Chapters 13 – 15 of the EIS for The Bays, Pyrmont and Hunter Street stations.

4. Site description

Revised tunnel alignment and turnback stub

Section 5.3 of the EIS for the Approved Project shows the indicative tunnel alignment between The Bays and Hunter Street stations. A complete revised tunnel alignment (as shown separately in previous Consistency Assessments SMW05, SMW07 and SMW11) is shown in Attachment A. The tunnel alignment is substratum only (entirely underground).

Relocation of the crossover cavern to Pyrmont

Once operational, customers would be able to access Pyrmont Station via two entrances, one on Union Street and one on Pyrmont Bridge Road, with connections to an underground concourse level within the station cavern with a central platform.

As assessed in SMW07, the indicative location of the crossover cavern has been relocated from The Bays Station to west of Pyrmont Station. Substratum acquisition occurred under the previous planning approval (Stage 2) of Sydney Metro West. Property owners impacted by substratum acquisition in Pyrmont and Hunter Street were notified in early 2023 and the formal acquisition process is complete for all properties.

Permanent undercut at Hunter Street eastern site

Hunter Street Station (Sydney CBD) would comprise two sites connected by a cavern in an east-west orientation, which would include an island platform. The eastern station site is bound by Hunter Street, Bligh Street and O'Connell Street. An eastern station entrance would be provided facing O'Connell Street. Secondary access to this entrance would also be provided from Bligh Street via an accessible through-site link. Escalators and lifts would be included as part of the through-site link to allow for level access between O'Connell and Bligh Streets.

At each site, escalators and/or stairs and lifts would provide access to an underground concourse level. The underground concourse level would provide an unpaid connection into Wynyard Station (via the existing underground pedestrian connection under George Street).

5. Site Environmental Characteristics

The proposed change covers the area between The Bays Station site and the turnback stub tunnel to the east of the Hunter Street Station eastern site.

The Pyrmont station eastern site is located in an established, dense urban area. Pyrmont Station is surrounded by predominantly low and medium-rise character terrace buildings, modern commercial and residential buildings, medium and high-density apartments and former warehouse buildings and local hotels at prominent corner sites. There are areas of local and regional visual sensitivity with the western site being within the Pyrmont Heritage Conservation Area (SLEP 2012 Item no. C52) and the eastern site being visible from the State listed heritage item Pyrmont Bridge (SHR Item no. 01618). The Pyrmont crossover would be located underneath the Pyrmont Heritage Conservation Area (SLEP 2012 Item no. C52). There are no AHIMS registered sites within 200 metres of the Pyrmont Station construction sites.

The Hunter Street eastern station site is centrally located within the Central Business District area of Sydney City. Surrounding land uses are predominantly commercial with no sensitive residential receivers located proximal to the site. The proposed turnback stub tunnel is east of the Hunter Street station eastern site, beneath the State heritage listed State Library of NSW (SHR Item no. 01071). The structure travels beneath the State Heritage Item Chifley Square (SHR item no. 01512) and The Domain, which forms part of the Nationally heritage listed Governors Domain and Civic Precinct. There is one AHIMS site within 200 metres of the Hunter Street station sites, however is not nearby the proposed undercut at the Hunter Street eastern site and would not be affected by the proposed change. The revised tunnel alignment is broadly within the same corridor assessed in the EIS of the Approved Project.

6. Justification for the proposed change

Revised tunnel alignment and turnback stub tunnel

The revised tunnel alignment and configuration of the turnback stub tunnel (previously assessed in Consistency Assessments SMW05, SMW07 and SMW11) are the result of detailed design development and construction planning that has occurred as a result of the staged planning approvals for Sydney Metro West. The realignment includes a simplified tunnel and turnback design which reduces the length of the turnback stub tunnel by about 300 metres. This arrangement enabled significant construction benefits relating to a reduced excavation footprint and improved construction efficiencies (assessed in SMW05) and reduced the overall substratum footprint of the turnback stub tunnel. The EIS for the Approved Project identified the importance of safeguarding opportunities for future extensions of the Sydney Metro network. The revised turnback tunnel configuration would futureproof for possible network extensions and would more efficiently cater for the ability of trains to turn around while not resulting in any additional impacts to non-Aboriginal heritage items from those assessed in the EIS, including Chifley Square and the State Library of NSW.

As documented in Consistency Assessment SMW11, during detailed construction planning under the previous planning approval, it was identified that the section of the tunnel alignment between the Hunter Street Station Eastern Site and the turnback tunnel would encroach on the City East Cable Tunnel (CECT). A reduction to the tunnel depth between the Hunter Street Station Eastern Site and the turnback tunnel would mitigate potential impacts from vibration and ground settlement during tunnelling (which would occur under the previous planning approval) and operations by providing for a greater clearance between the approved tunnel alignment and the CECT. The CECT is a critical piece of infrastructure which provides electricity to the Sydney CBD. It would not be possible relocate or reinforce the utility without disrupting the power supply to the CBD, which would result in inacceptable community and socioeconomic impacts. As such, reducing the depth of the Sydney Metro West tunnels between the Hunter Street Station eastern site and turnback tunnels beneath The Domain by up to about four metres has been identified as the most suitable approach to mitigate potential impacts during construction and operations of Sydney Metro West, and would ensure that adequate clearance is provided between the Sydney Metro West tunnels and the Ausgrid assets.

There are no additional design changes proposed as part of this consistency assessment.

Permanent undercut at Hunter Street eastern site

The permanent shaft undercut documented in Consistency Assessment SMW05 would provide additional necessary space to facilitate pedestrian and escalator vertical transport movements through the station (once operational).

Relocation of the crossover cavern to Pyrmont

As a result of detailed design that occurred under the previous planning approval (Stage 2), it was identified that relocating the crossover cavern to Pyrmont from The Bays would provide greater efficiencies during construction and operations. Construction benefits associated with tunnelling and excavation of the crossover were assessed in SMW07.

As documented in Consistency Assessment SMW07, realigning the tunnel about 16 metres south, and relocating the crossover cavern from The Bays to Pyrmont would reduce the length and curvature of the tunnel alignment. This would improve the speed potential for trains during operations and result in an improved operational efficiency when compared to the indicative tunnel alignment assessed for the Approved Project.

In addition to the potential travel time benefits, following from project approval, Sydney Metro identified that relocating the crossover cavern from The Bays to Pyrmont would provide a strategic benefit to customers during operations, in the event where customers were required to disembark and evacuate from the Metro. Section 1.2.8 of the Revised Proposal Description outlined that an emergency egress strategy would be implemented that allows emergency access and egress from trains throughout the tunnel sections of the alignment, to facilitate emergency access and exit between the two tunnels, cross passages would be provided. The indicative tunnel alignment assessed for the approved project assumed the crossover cavern and respective cross passages to be located on the western side of Blackwattle Bay, at The Bays station site. Further detailed design planning, prior to the Consistency Assessment SMW07, identified that the Pyrmont location would provide a more suitable disembarkment location for customers in the event of degraded mode operations or an emergency evacuation. Pyrmont is significantly closer to the Sydney CBD which has a greater range of alternative transport options (including heavy rail, light rail, buses and active transport routes) compared to The Bays. This is considered a more efficient alternative for customers as opposed to deploying and operating alternative transport from The Bays. This was outlined in the Consistency Assessment SMW07. There are no additional design changes proposed as part of this consistency assessment.

7. Environmental Benefit

Revised tunnel alignment and turnback stub

Construction related benefits which included a reduction in excavation activity and spoil volumes were assessed in Consistency Assessment SMW05. The revised tunnel alignment would provide some minor speed improvement between Pyrmont and Hunter Street stations. It would also shift the alignment away from the Maritime Museum Wharf at Darling Harbour and reduce the proximity of the tunnels and turnback stub tunnel at Hunter Street to sensitive receivers, minimising impacts to nearby heritage items.

Permanent undercut at Hunter Street eastern site

Benefits of the permanent undercut were outlined in Consistency Assessment SMW11 and would enable improved customer access to the station during operations and would provide improved customer outcomes.

Relocation of the crossover cavern to Pyrmont

Benefits of the relocated crossover cavern were discussed in Consistency Assessment SMW07. The reduction of excavation required by relocating the crossover cavern to The Bays would deliver positive sustainability and cost savings through the net reduction in construction materials and waste and would provide configuration benefits to the railway during operations.

8. Control Measures

Will a project and site specific EMP be prepared?	☒ Yes ☐ No	**Are appropriate control measures already identified in an existing EMP?** A project and site specific EMP would be prepared upon the appointment of the successful contractor. The EMP will be prepared in accordance with the relevant conditions of approval and project mitigation measures and include the appropriate control measures for the activities described within this Consistency Assessment. All work will be undertaken	☒ Yes ☐ No

		in accordance with the control measures outline in the project and site specific EMP.	

9. Conditions of approval / Environmental mitigation measures

Number	Condition of Approval/ Environmental mitigation measure	Discussion on relevance and consistency for proposed change
E34	A DNVIS must be prepared for each construction site before construction noise and vibration impacts commence and include specific mitigation measures identified through consultation with the occupants of affected sensitive land use(s) and updated as required if site conditions or activities change.	In accordance with Condition of Approval E34, a Detailed Noise and Vibration Impact Statement would be prepared for each construction site prior to the commencement of noise and vibration impacts.
E49	The Proponent must prepare an Operational Noise and Vibration Review (ONVR) to confirm noise and vibration mitigation measures to be implemented for the operation of the ultimate service. The ONVR must be prepared as part of the iterative design development and in consultation with the EPA, Relevant Council(s) and SOPA (in respect of Sydney Olympic Park) and other relevant stakeholders and must: (a) identify appropriate operational noise and vibration objectives and levels representative of surrounding development, including existing and approved (as known at the date of this approval) sensitive land use(s); (b) confirm the operational noise and vibration predictions based on the expected final design including all plant and equipment associated with the premises. Confirmation must be based on an appropriately calibrated noise model; (c) confirm the appropriate track attenuation required to meet the design noise objectives for ground-borne noise land uses; (d) assess low frequency noise impacts and outline proposed mitigation measures, where relevant, in accordance with Noise Policy for Industry (EPA, 2017) and specifically the additional guidance in Fact Sheet C; (e) consider sleep disturbance impacts from the operation of draught relief shafts taking into account the number of events and the frequency of occurrence during the night time period; (f) identify sensitive land uses that are predicted to exceed: (i) noise criteria set out in the Rail Infrastructure Noise Guideline (EPA, 2013), Noise Policy for Industry (EPA, 2017); and (ii) vibration goals for human exposure for existing sensitive land use(s), as presented in Assessing Vibration: a Technical Guideline (DECC, 2006). (g) identify all noise and vibration mitigation measures including location, type and timing of mitigation measures, with a focus on: (i) source control and design;	An ONVR would continue be prepared in accordance with Condition of Approval E49. The Review would include an assessment confirming the appropriate track attenuation type that has been selected in order to meet the design noise objectives for ground-borne noise. This would be relevant for the whole tunnel alignment, including the turnback stub, east of the Hunter Street Station, and the relocated crossover cavern at Pyrmont. The proposed changes within this Consistency Assessment would be consistent with the Condition.

	(ii) at the receiver (if relevant); and (iii) 'best practice' achievable noise and vibration outcome for each activity (h) describe how the final suite of mitigation measures will achieve: (i) the noise criteria outlined in the Rail Infrastructure Noise Guideline (EPA, 2013) and Noise Policy for Industry (EPA, 2017); (ii) vibration goals for human exposure for existing sensitive land use(s), as presented in Assessing Vibration: a Technical Guideline (DECC, 2006); and (iii) ground-borne noise objectives for track form; (i) include a consultation strategy to seek feedback from directly affected landowners on the noise and vibration mitigation measures being offered; and (j) include procedures for operational noise and vibration complaints management, including investigation and monitoring (subject to complainant agreement). The ONVR must be verified by an independent acoustic expert before the implementation of any operational noise mitigation measures. The Proponent must implement the identified noise and vibration control measures as verified by the acoustic expert and make the ONVR publicly available.	
E50	Within 12 months of the commencement of operation, monitoring of operational noise and vibration (including ground-borne noise) to compare actual noise and vibration performance of the CSSI against the noise and vibration performance predicted and the review of mitigation measures required by Condition E49, must be undertaken. An Operational Noise and Vibration Compliance Report (ONVCR) must be prepared to document this monitoring and include, but not necessarily be limited to: (a) noise and vibration monitoring (including ground-borne noise) to assess compliance with the operational noise and vibration levels predicted in the review required under Condition E49; (b) methodology, location and frequency of noise and vibration monitoring undertaken, including monitoring sites at which CSSI noise and vibration levels are ascertained, with specific reference to locations indicative of impacts on receivers; (c) a review of the performance of the CSSI against: (i) operational noise levels in terms of criteria and noise goals established in the NSW Rail Infrastructure Noise Guideline (EPA, 2013) and Noise Policy for Industry (EPA, 2017); (ii) vibration goals for human exposure for existing sensitive land use(s), as presented in Assessing Vibration: a Technical Guideline (DECC, 2006); (d) details of any complaints and enquiries received in relation to operational noise and vibration generated by the CSSI (between the date of commencement of operation and the date the report was prepared);	In accordance with Condition of Approval E50, within 12 months of the commencement of operation Sydney Metro would undertake monitoring of operational noise and vibration (including ground-borne noise) generated by operations of Sydney Metro West to review performance against the relevant noise criteria, and requirements. This would determine if any additional measures are required to mitigate noise and vibration impacts during operations.

	(e) an assessment of the performance and effectiveness of applied noise and vibration mitigation measures together with a review and if necessary, reassessment of mitigation measures; (f) identification of: (i) additional measures to meet the criteria outlined in the NSW Rail Infrastructure Noise Guideline (EPA 2013) and Noise Policy for Industry (EPA, 2017), (ii) additional measures to meet the vibration goals for human exposure for existing sensitive land, as presented in Assessing Vibration: a Technical Guideline (DECC, 2006); (iii) when these measures are to be implemented (with implementation to be undertaken within six (6) months of completion of this report unless otherwise agreed by the Planning Secretary); and (iv) how their effectiveness is to be measured and reported to the Planning Secretary and the EPA. The ONVCR must be submitted to the Planning Secretary and the EPA within 60 days of completing the operational noise and vibration monitoring and made publicly available.	
REMM EIS-NV3	Track form would be confirmed as part of design development in order to meet the relevant ground-borne noise and vibration criteria from the Rail Infrastructure Noise Guidelines (EPA, 2013).	EIS Technical Paper 3 included a preliminary assessment of ground borne noise and vibration criteria against various track attenuation type scenarios. The appropriate track form would be confirmed during design development in accordance with REMM EIS-NV3 and the relevant Conditions of Approval, to ensure the relevant ground-borne noise and vibration criteria can be met.
REMM EIS-NV4	An Operational Noise and Vibration Review would be prepared during design development to confirm the mitigation measures required to manage: • airborne and ground-borne noise and vibration impacts from rail operations • airborne noise impacts from the stabling and maintenance facility • airborne noise impacts from fixed industrial sources, including stations and services facilities. The NSW Environment Protection Authority would be consulted during preparation of the Operational Noise and Vibration Review.	Sydney Metro would prepare an Operational Noise and Vibration Review during the detailed design development phase. The review would confirm noise and vibration impacts associated with operations of the Approved Project. For the substratum tunnel, crossover, and turnback stub tunnel between The Bays and Hunter Street Stations, the Review would include an assessment of ground-borne noise and vibration impacts from rail operations, and would confirm any ongoing mitigation measures required to manage impacts identified through the assessment process.
Will the proposed change be consistent with the conditions of approval?	☒ Yes	

	☐ No

10. Impact Assessment – Construction

Construction activities associated with excavation and tunnelling (Stage 2) have been assessed under Consistency Assessments SMW05, SMW07 and SMW11. This section assesses any impacts related to the tunnel fit-out, construction of stations, ancillary facilities and station precincts (Stage 3).

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
Biodiversity	All construction works associated with the proposed change would be substratum and as such, there would be no additional removal or trimming of vegetation. All excavation and tunnelling works would occur under the previous planning approval (Stage 2) for Sydney Metro West and therefore there would be no impacts to groundwater dependent ecosystems. Overall, there would be no change to biodiversity impacts associated with the proposed change.	No additional Measures required.	Y	N	Y	
Water	The proposed change relates to the fit-out, testing and commissioning and operations of the revised tunnel alignment and configuration assessed in SMW05, SMW07 and SMW11, as well the fit-out and use of the shaft undercut at the Hunter Street Station eastern construction site. There is no change to the construction methodology for tunnel fit out works as a result of the proposed change to the tunnel alignment. Consistent with the approach to drainage and stormwater (as discussed in Section 1.5.6. of the Revised Proposal Description of the RtS), once constructed, the stations and tunnels would be	No additional Measures required.	Y	N	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	tanked to prevent the ingress of groundwater during operation. The construction activities associated with the Stage 3 CSSI approval remain consistent and additional impacts to ground and surface water are not anticipated.					
Soils and contamination	Tunnelling and earthworks for the approved project were assessed in the previous planning approval (Stage 2) for Sydney Metro West. As the proposed change relates to fit-out, testing and commissioning and operations of the revised tunnel alignment and configuration assessed in SMW05, SMW07 and SMW11, there would be no additional impacts to soils and contamination.	No additional Measures required.	Y	N	Y	
Air quality	Given that the proposed changes would be located underground and there is no change to the construction methodology, the proposed works in this Consistency Assessment would not result in additional air quality impacts compared with that for the Approved Project.	No additional Measures required.	Y	N	Y	
Noise and vibration	Construction methods for the fit-out of the tunnel alignment and rail systems are described in Section 2.4.6 of the Revised Proposal Description of the Response to Submissions for the Approved Project. The proposed change to the tunnel realignment between The Bays and Hunter Street, the turnback stub tunnel east of Hunter Street Station, and the relocation of the crossover cavern to Pyrmont would not change the methodology for tunnel and systems fit-out assessed for the Approved Project. The alignment of the Sydney Metro track between The Bays and Hunter Street Stations is shown in Figures 1-9 and 1-10 of the Revised	No additional Measures required.	Y	N	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	Proposal Description of the Submissions Report. The figures show the indicative tunnel alignment between The Bays and Hunter Street to range between 29 and 48 metres in depth. The depths of the tunnels and crossover cavern at Pyrmont were documented in Consistency Assessment SMW07. At Hunter Street, this includes a minor reduction to the depth of the tunnel alignment and turnback tunnel by about 1-4 metres depending on the location, with the greatest depth change affecting the turnback stub tunnels beneath the domain. This is generally within the corridor of the Approved Project. **Tunnel alignment, turnback stub, and relocation of crossover cavern to Pyrmont** Consistent with the Approved Project, fit-out of the tunnels would occur up to 24 hours per day, seven days per week. Section 5.4 of Technical Paper 4 for the Approved Project assessed that due to the depth of the tunnel alignment, that potential ground-borne noise and vibration impacts during the fit-out of tunnels would be negligible, with no exceedances of the cosmetic damage screening criteria and human comfort criteria between The Bays and Hunter Street Stations. As described above, the tunnel realignment, turnback tunnel and relocation of the crossover cavern to Pyrmont (as documented in Consistency Assessment SMW07) would be minor and would be generally within the corridor of the Approved Project. Noting that the proposed change would not alter the construction methods for the fit-out of the tunnel alignment and rail					

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	systems (as described in Section 2.4.6 of the Revised Proposal Description of the Submissions Report), ground-borne noise and vibration impacts would remain as negligible. In accordance with Condition of Approval E34, a Detailed Noise and Vibration Impact Statement would be prepared for each construction site prior to the commencement of noise and vibration impacts. **Shaft undercut** Detailed noise and vibration impacts at the Hunter Street eastern construction site were assessed in Section 5.2.9 of Technical Paper 4 of the EIS. Construction and fit-out of the shaft undercut would occur as 'typical work' during station facility and construction phase assessed in Technical Paper 4. This includes fit-out works and installation of structural, mechanical and electrical systems at the stations and facilities. The assessment found that there would be no exceedances of the cosmetic damage screening criteria at Hunter Street Station during fit-out works. The assessment also identified that fit-out works would generally not include noise intensive equipment, however that periodic uses of equipment such as concrete saws may be required. The assessment identified the following air-borne noise exceedances of the NML during a 'typical' work scenario during station and facility construction:					

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	• 1 – 10 dbA at 9 receivers during the standard daytime construction hours and daytime out of hours work period • 1 – 10 dbA at 1 receiver during the evening period • 1 – 10 dbA at 3 receivers during the night-time works period, and • 11 – 20 dBA at 1 receiver during the night-time period. The permanent shaft undercut would extend slightly beyond the approved construction site boundary, beneath the roadway of Hunter Street, however, would be the same depth as the station cavern. Fit-out of the shaft undercut would involve the same methods as described in Section 2.4.6 of the Revised Proposal Description of the Response to Submissions for the Approved Project. As a result, it is not expected that there would be a change to the vibration, or air-borne noise impacts assessed from the approved project.					
Aboriginal Culture and Heritage	Given that the works are located underground and there is no change to the construction methodology for tunnel and systems fit-out assessed for the Approved Project, the proposed works in this Consistency Assessment would not result in any Aboriginal Culture and Heritage impacts.	No additional Measures required.	Y	N	Y	
Historic Heritage	All works would be substratum, occurring within the tunnels and excavated station structures and would not be visible from outside of the approved construction sites. As such, the works would not	No additional Measures required.	Y	N	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	change the temporary direct and indirect (visual) impacts assessed for the Approved Project. **Revised tunnel alignment and turnback stub** Refinements to tunnel alignment have been assessed as part of Consistency Assessments SMW05, SMW07 and SMW11. Section 5.4 of Technical Paper 4 for the Approved Project assessed that due to the depth of the tunnel alignment, that potential ground-borne vibration impacts during the fit-out of tunnels would be negligible, with no exceedances of the cosmetic damage screening criteria and human comfort criteria between The Bays and Hunter Street Stations. Given that works are located underground and there is no change to the construction methodology for tunnel and systems fit-out assessed for the Approved Project, the proposed works in this Consistency Assessment would not result in additional historic heritage impacts. **Relocation of the crossover cavern to Pyrmont** The revised location of the Pyrmont crossover cavern (as documented in Consistency Assessment SMW07) would be directly below The Pyrmont Heritage Conservation Area (HCA) – SLEP 2012 Item no. C52. It would also be in the vicinity of a number of local heritage items including:					

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	• Former commercial building 'Bonnington & Co' (SLEP 2012 item no. I1229) • Terrace group (SLEP 2012 item no. I1247) • Former Australian Joint Stock Bank (SLEP 2012 item no. I1272). Additionally, there is no change to the construction methodology as a result of the tunnel realignment, the proposed works in this Consistency Assessment would not result in additional historic heritage impacts.					
Community and socio-economic	The tunnel realignment between The Bays and Hunter Street, the turnback stub tunnel east of Hunter Street Station, and the relocation of the crossover cavern to Pyrmont would not change the methodology for tunnel and systems fit-out assessed for the Approved Project. As the works subject of this Consistency Assessment relates to substratum works within the tunnels and the Hunter Street station eastern construction site, there would be no change to the noise and vibration impacts at the station construction site locations. Additionally, despite the proposed refinements to tunnel alignment and tunnel features, ground-borne noise and vibration impacts would remain as negligible. There would also be no substantial changes to traffic, land use and property, landscape and visual amenity and air quality as a result of the proposed changes. As a result, there would be no substantial changes to the community and	In accordance with Condition E34, a Detailed Noise and Vibration Impact Statements (DNVIS) would be prepared prior to commencement of works to respond to noise and vibration impacts and provide site specific mitigation measures.	Y	N	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	socio-economic impacts of the proposed changes compared with that for the Approved Project. During construction, potential noise and vibration impacts would be managed through compliance with the project Condition of Approval E34, which requires preparation of a Detailed Noise and Vibration Impact Statement prior to the commencement of construction. Where required Sydney Metro would undertake consultation with sensitive land users to assist with determining site-specific mitigation measures to minimise impacts during construction.					
Traffic and transport	**Tunnel re alignment and turnback stub** Transport and traffic related impacts would be related to tunnel fit-out work during construction. Noting that the complete tunnel realignment between The Bays and Sydney CBD would be broadly consistent with the Approved Project, it is not likely that there would be a substantial change to the volume of materials required for fit-out work. Overall it is not anticipated that there would be an increase the heavy vehicle volumes that were assessed in the Approved Project. **Shaft undercut** There would be no material change to the estimated construction vehicle volumes. Given that the construction methodology for tunnel and systems fit out would be consistent with that described in the EIS, any impacts would be able to be managed in accordance with the existing environmental mitigation measures.	No additional Measures required.	Y	N	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	Relocation of the crossover cavern to Pyrmont Given that there is no change to the construction methodology for tunnel and systems fit-out assessed for the Approved Project, no additional impacts on the local road, active transport or public transport networks are anticipated.					
Waste and resource management	Changes to waste and resource management related to tunnelling works have been assessed under previously endorsed Consistency Assessments (SMW05, SMW07 and SMW11). The construction activities associated with the Stage 3 CSSI approval (fit-out of the tunnels) remain consistent and substantial change to waste and resource management compared with that for the Approved Project is considered unlikely.	No additional Measures required.	Y	N	Y	
Visual	As the proposed changes would be substratum, there would be no change to the landscape and visual impacts assessed in the Approved Project.	No additional Measures required.	Y	N	Y	
Land use and property	The proposed additional shaft undercut extends outside the approved Hunter Street Station (Sydney CBD) construction site, and partially outside the Approved Project corridor located beneath a public roadway. There would be no change to the land use and surface property impacts associated with the Approved Project. There has been no additional changes to substratum acquisition required. Property owners impacted by substratum acquisition in Pyrmont and Hunter Street were notified in early 2023 and	No additional Measures required.	Y	N	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	the formal acquisition process is complete for all properties.					
Hazard and risk	No changes from the Approved Project.	No additional Measures required.	Y	N	Y	
Other	No changes from the Approved Project.	No additional Measures required.	Y	N	Y	

11. Impact Assessment – Operation

The operation impact assessment identifies any impacts associated with the design refinements documented in Consistency Assessments SMW05, SMW07 and SMW11.

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
Biodiversity	All proposed works in this Consistency Assessment would not result in the additional removal or trimming of any vegetation, therefore there would be no changes from the Approved Project.	No additional Measures required.	Y	N	Y	
Water	**Surface water and flooding** As the crossover and the tunnel realignment would be located underground and the surface level approved Pyrmont Station construction sites would not change, the no changes to the flooding or surface water quality impacts described in the EIS for the Approved Project are anticipated. **Groundwater - Tunnel alignment** As the tunnels would be tanked (restricting groundwater inflow) during construction, there would not be substantial occurrences of groundwater inflow into the tunnels during operation of the Approved Project (Stage 3). **Groundwater – shaft undercut** Assessment of groundwater impacts in the previous planning approval (Stage 2) found that the groundwater level would be predicted to reduce to about 29 metres below ground level and was assumed to remain at the commencement of construction of the Approved	Sydney Metro would adhere to Condition E2 of the Conditions of Approval to manage the risk of flooding.	Y	N	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	Project (Stage 3). As the shaft undercut would be progressively lined under the previous planning approval and would not sit beneath the expected groundwater level, it is not likely that groundwater inflows would occur during operations. **Groundwater – Relocation of crossover to Pyrmont** As the excavated areas would be tanked under the previous planning approval (Stage 2) there would be no change to the groundwater impacts associated with the proposed change.					
Soils and contamination	No changes from the Approved Project.	No additional Measures required.	Y	N	Y	
Air quality	No changes from the Approved Project.	No additional Measures required.	Y	N	Y	
Noise and vibration	**Tunnel realignment** The tunnel realignment (as documented in Consistency Assessments SMW05) is a minor change from that identified in the EIS for the Approved Project, with the greatest realignment resulting in the tunnels moving about 16 metres north from the EIS alignment at Blackwattle Bay. The vertical alignment of the tunnel and turnback stub tunnel would be consistent with the Approved Project and as such, noise and vibration impacts during operation are not expected to change. Noting that there are no significant changes to the tunnel location and vertical alignment, the extent of noise and vibration impacts is not expected to change from the Approved Project. **Shaft undercut**		Y	N	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	Operational noise and vibration impacts were assessed in Technical Paper 3 of the EIS where it was found that the Hunter Street station would comply with the design noise criteria with the inclusion of appropriate noise attenuation measures. The proposed shaft undercut would be to facilitate vertical transport through the station. Vertical transport (typically by use of lifts or escalators) is not a highly noise or vibration intrusive activity and is therefore would not result in an exceedance of the noise and vibration impacts assessed in the Approved Project. **Relocation of crossover cavern to Pyrmont** The tunnel realignments subject of Consistency Assessment SMW07 are within the EIS assessment corridor and the depth of the alignment would be generally consistent with the Approved Project apart from Hunter Street where there would be a minor reduction in the depth of the tunnel by about four metres. As these are minor changes to the tunnel alignment, operational noise and vibration impacts are not expected to change. Additionally, the noise impacts for Pyrmont are predicted to comply with the design noise criteria. The EIS from the Approved Project determined that ground-borne noise and vibration criteria could be achieved between The Bays and Pyrmont stations with the use of Scenario 2 track form (Type 2 and Type 1A) apart from a 330 m section of Type 3A IST under recording studios in Pyrmont, and that the alignment section to the west of Pyrmont station be suitable for Scenario 2 track form (Type 2 and Type 1A).					

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	Track form and attenuation types remain subject to ongoing detailed design development, and would be confirmed as part of design development in order to meet the relevant ground-borne noise and vibration criteria from the Rail Infrastructure Noise Guidelines (EPA, 2013), consistent with EIS-NV3. In accordance with Condition E49 and REMM EIS-NV4, Sydney Metro would undertake an Operational Noise and Vibration Review as a part of the detailed design process to confirm any noise and vibration mitigation measures to be implemented to manage ground-borne noise and vibration impacts from rail operations. This would include confirming the appropriate track attenuation required to meet the design noise objectives for ground-borne noise land uses. As per Condition E50, within 12 months of the commencement of operation Sydney Metro would undertake monitoring of operational noise and vibration to review performance against the relevant noise criteria, and requirements. This would determine if any additional measures are required to mitigate noise and vibration impact during operations.					
Aboriginal Culture and Heritage	No changes from the Approved Project.	No additional Measures required.	Y	N	Y	
Historic Heritage	As all works proposed in this Consistency Assessment would be located underground. The surface level approved Pyrmont Station and Hunter Street Station construction sites would not change. As a result, no additional visual (direct and indirect) heritage impacts beyond those	No additional Measures required.	Y	N	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	assessed in the Approved Project are anticipated. **Tunnel realignment** Technical Paper 5 (Non-Aboriginal Heritage) of the EIS identities that ground-borne vibration associated with the operation of the Approved Project is predicted to be well below human comfort criteria, which is also well below the thresholds associated with cosmetic building damage. As such, no cosmetic damage to structures (and therefore no structural damage) is predicted at any location due to the operation of the Approved Project. The tunnel realignment would be substratum only (entirely underground). The tunnel alignment is located directly beneath the State Library (SHR Item no. 01071), Chifley Square (SHR Item no. 01512), and the Royal Botanical Gardens and Domain (including Governor's Domain and Civic Precinct) (NHL Place ID 106103). The depths of the realigned tunnels would be similar to the relevant sections of the approved tunnel alignment for all sections of the alignment except for at Chifley Square, where the vertical alignment of the tunnels would be expected to decrease in depth by about four metres. The tunnel alignment and revised location of the turnback stub tunnel would remain within the EIS corridor boundary and as a result there would be no additional impacts to historic heritage. The appropriate track form would be confirmed during design development in accordance with REMM EIS-NV3 and the relevant Conditions of					

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	Approval, to ensure the relevant ground-borne noise and vibration criteria can be met. Additionally, Condition E49 and REMM EIS-NV4 identifies that Sydney Metro would undertake an Operational Noise and Vibration Review as a part of the detailed design process to confirm any noise and vibration mitigation measures to be implemented to minimise operational impacts. **Relocation of crossover cavern to Pyrmont** The crossover cavern would be directly below The Pyrmont Heritage Conservation Area (HCA) – SLEP 2012 Item no. C52. It would also be in the vicinity of a number of local heritage items including: • Former commercial building 'Bonnington & Co' (SLEP 2012 item no. I1229) • Terrace group (SLEP 2012 item no. I1247) • Former Australian Joint Stock Bank (SLEP 2012 item no. I1272). These heritage items were assessed for impacts in Technical Paper 5 of the EIS for the Approved Project. There would be no risk of cosmetic or structural damage to buildings in the vicinity of the crossover cavern location which is consistent with the impacts assessed in the Approved Project.					
Community and socio-economic	**Tunnel alignment and turnback stub** The community and socio-economic impacts would not change as a result of the tunnel realignment.	No additional Measures required.	Y	N	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	The realignment is as a result of further design development and construction planning that has occurred throughout the staged project approvals for Sydney Metro West. The revised tunnel alignment would mitigate potential impacts from vibration and ground-settlement during tunnelling (which would occur under the previous planning approval) and operations by providing for a greater clearance between the approved tunnel alignment and the CECT. The CECT is a critical piece of infrastructure and would not be possible relocate or reinforce the utility without disrupting the power supply to the CBD, which would result in inacceptable community and socioeconomic impacts. The reduction to the tunnel depth between Hunter St eastern site and turnback tunnels would mitigate potential ground and noise vibration impacts to the CECT during operations of Sydney Metro West, and would ensure that adequate clearance is provided between the Sydney Metro West tunnels and the Ausgrid assets. The tunnel realignment would also provide safeguarding opportunities for future extensions of the Sydney Metro network, providing transport and accessibility opportunities for customers. **Relocation of crossover cavern to Pyrmont** Relocating the crossover cavern to Pyrmont Station (subject of Consistency Assessment SMW07) would enable improved customer experience benefits in the end state operational stage of the project. The Pyrmont Station site is situated geographically closer to the Sydney CBD compared to The Bays station. In the event of an					

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	emergency evacuation where customers would be required to alight from the trains and tunnels, it would be more suitable for customers to evacuate at a location that is serviced by numerous alternative transport options. The Pyrmont Station site is proximal to the Inner West Light Rail services, several direct bus services, and is within a walkable distance to the Sydney CBD where a range of transport options are available. This would reduce the need for reliance on deploying and operating alternative transport options such as rail replacement buses which can take time to travel from the depot to the station site. This is a change from the Approved Project, however, would be a positive benefit. **Shaft undercut** The additional shaft undercut within the operational footprint at Hunter Street Station would result in additional operational benefits. This feature would facilitate the provisioning of vertical transport (i.e. escalators) for customers travelling from the street level of Hunter Street, into the future station.					
Traffic and transport	In the event of an emergency evacuation where customers would be required to alight from the trains and tunnel at Pyrmont this would likely result in temporary increase of pedestrian movements beyond those assessed in the Approved Project. As this occurrence would be expected to be highly irregular it is not expected to have any impact on the day-to-day operations	No additional Measures required.	Y	N	Y	

Aspect	Nature and extent of impacts (negative and positive) during construction (if control measures implemented) of the proposed change, relative to the relevant impact in the Approved Project	Proposed Control Measures in addition to project CoA and REMMs	Consistent Impact Y/N	Do any CoA need to be changed? Y/N	Endorsed	
					Y/N	Comments
	of the station or surrounding road and pedestrian network.					
Waste and resource management	No changes from the Approved Project.	No additional Measures required.	Y	N	Y	
Visual	All proposed changes assessed in this Consistency Assessment would be below ground and as such, there would be no changes from the Approved Project.	No additional Measures required.	Y	N	Y	
Land use and property	Given the changes are located underground, no impacts to land use and surface property are anticipated during operations. Property owners impacted by changes to substratum acquisition at Pyrmont and Hunter Street were notified in early 2023 and the formal acquisition process is complete for all properties (documented as part of Consistency Assessments SMW07 and SMW11) .	No additional Measures required.	Y	N	Y	
Hazard and risk	The relocation of the crossover to Pyrmont provides a more suitable disembarkment location for customers in the event of degraded mode operations or an emergency evacuation, as the site is more connected to other transport modes including bus and light rail services and closer to the Sydney CBD.	No additional Measures required.	Y	N	Y	
Other	No changes from the Approved Project.	No additional Measures required.	Y	N	Y	

12. Consistency with the Approved Project

Question	Response
Is the project (including the proposed changes) consistent with the conditions of approval?	Yes. The tunnel realignment and tunnel feature refinements would be consistent with the Conditions of Approval.
Is the project (including the proposed changes) consistent with the objectives and functions of elements of the Approved Project?	Yes. The changes identified in this assessment are consistent with the objectives and functions of the elements of the Approved Project.
Are the environmental impacts of the proposed change consistent with the impacts of the Approved Project?	Yes. The proposed works would not result in any changes to environmental impacts as assessed in the Approved Project.
Are there any new environmental impacts as a result of the proposed works/project changes?	The proposed works would not result in any new environmental impacts beyond those considered in the Approved Project. Impacts assessed in this Consistency Assessment are consistent with those found for the Approved Project and would be managed under the Approved Project's existing Conditions of Approval and Environmental Mitigation Measures.
Are the impacts of the proposed activity/works known and understood?	Yes. The impacts of the proposed works are understood and will be accounted for by implementing the Mitigation measures and Conditions of Approval for the Approved Project.
Are the impacts of the proposed activity/works able to be managed so as not to have an adverse impact?	Yes. The impacts of the proposed works can be managed so as to avoid an adverse impact.
Would any Conditions of Approval be required to be changed as a result of the proposed change (having regard to the above assessment)?	☐ Yes ☒ No
Is the proposed change/s consistent with the approval (having regard to the above assessment)?	☒ Yes ☐ No

13. Other Environmental Approvals

Identify all other approvals required for the proposed works:	N/A

14. Recommendation

Based on the above impact assessment, and with reference to the Sydney Metro West Environmental Impact Statement – Rail infrastructure, stations, precincts and operations (Sydney Metro, March 2022), Submissions Report – Rail infrastructure, stations, precincts and operations (Sydney Metro, August 2022) and the Conditions of Approval, it is recommended that:

	Tick relevant box
The proposed change has negligible or more than negligible impacts on the environment or community however is consistent with the Approval, including the conditions of approval. The proposed impacts are consistent with those assessed for the Approved Project (i.e., does not trigger a change to the conditions of approval).	✓
The proposed change is not consistent with the Approved Project including the conditions of approval and would be subject to a separate modification application.	
The proposed change is not substantially the same as the Approved Project and is considered a radical transformation. A new planning pathway should be considered.	

Author certification

I certify that to the best of my knowledge this Consistency Checklist: • Examines and takes into account the fullest extent possible all matters affecting or likely to affect the environment as a result of activities associated with the proposed change; and • Examines the consistency of the proposed change with the Approved Project; is accurate in all material respects and does not omit any material information.			
Name:	Isabella Caruso	Signature:	Isabella Caruso
Title:	Planning Approvals Officer		
Company:	Sydney Metro	Date:	14 May 2024

Assessment Supporting Signature

Application supported and submitted by			
Name:	Charlotte Brogan	Date:	14/05/2024
Title:	A/ Manager Planning Approvals	Comments:	
Signature:	Charlotte Brogan		

Assessment Endorsement

Based on the above assessment, are the impacts and scope of the proposed change consistent with the existing Approved Project?

Yes ☑ The proposed change is consistent with the Approved Project and no further assessment is required.

No ☐ The proposed change is not consistent with the Approved Project.

A modification or a new activity approval/ consent is required. Advise Senior Project Manager of appropriate alternative planning approvals pathway to be undertaken.

Endorsed by			
Name:	Jessie Strange	Date:	14/5/2024
Title:	A/ Senior Manager Planning Approvals	Comments:	
Signature:			

Attachment A – Corridor realignment as documented in Consistency Assessments SMW05, SMW07 and SMW11.

Appendix B – Permanent shaft undercut as documented in Consistency Assessment SMW05