

# Independent Environmental Audit on Sydney Metro City and Southwest – Design

## Final Report

**Contract works: Program wide: Underground Stations Design & Technical Services (USDTS)**

**Scope: Planning Approvals in Design, incl. compliance review & prior review findings, focusing on Barangaroo Station (Criteria: EIS, MCoAs, REMMs & SM Design Guideline)**

**Reference: SM18.19-060-CSW-MET-ENV**

30/08/2018

<b>Audit Organisation:</b>	QEM Consulting	<b>Audit Date:</b>	13 August 2018
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## 1. Executive Summary

### 1.1 Introduction

The purpose of this Independent Environmental Audit was to review the METRON design processes and outputs on the Underground Station Design and Technical Services (USDTS) Stage 1 Design to assess compliance with relevant planning approvals, Revised Environmental Mitigation Measures (REMMs) and Sydney Metro Design Guidelines. A follow-up on findings and requested clarifications from a previous review by the Environment Representative was also part of the scope. The audit focused on Barangaroo Station, however additional various other underground stations were included in the scope.

### 1.2 Background

Planning Approvals issued by the Department of Planning & Environment require Transport for NSW to develop an Environmental Audit Program for independent annual environmental auditing against the terms of the approval. QEM Consulting Pty Ltd have been engaged by Sydney Metro Delivery Office (SMDO) Safety, Sustainability & Environment (SSE) to deliver a program of Independent Environmental Audits. As required by Critical State Significant Infrastructure Approval SSI 15\_7400 Condition A37: Sydney Metro City and Southwest Chatswood to Sydenham and the associated Audit Program, an Independent Environmental Audit was undertaken to assess compliance with relevant Planning Approvals.

The USDTS will be executed in 3 stages: Stage 1 – Preliminary Design; Stage 2 – Substantial Design and; Stage 3 – Issued for Construction. The Metron JV team has been commissioned to design five of the Sydney Metro city underground stations (Crows Nest, Victoria Cross, Barangaroo, Pitt Street, Waterloo) for Stage 1 Preliminary Design (40%). At the time of the audit, all the Stage 1 designs were complete with Barangaroo completed in February 2018, and Pitt Street in May 2018. It is expected that Metron would also be commissioned to undertake the Stage 2 Substantial Design (to 100%) of Barangaroo Station, however formal instructions to proceed had not yet been issued by Sydney Metro. Metron is a joint venture of Arcadis and Mott MacDonald, with principal sub-consultants Robert Bird Group, Foster + Partners, Architectus, WT Partnership and McKenzie Group.

Individual tenders will be progressively let and contracts awarded for the Stage 2 and 3 design and for construction for the Crows Nest, Victoria Cross, Pitt Street and Waterloo station. It is understood that all Preliminary Stage 1 design documents will be provided to the successful Design and Construct tenderers as the basis for the Stage 2 design. As noted above, Metron is likely to progress the Stage 1 Barangaroo design to 100%, and a construct-only contract will be awarded at the completion of the final design.

### 1.3 Objective and Scope

The main objective of this audit was to verify processes to ensure compliance with Planning approval requirements (Ministers Conditions of Approval (MCoA) and Revised Environmental Mitigation Measures (REMM)) and Sydney Metro Design Guidelines. A follow up on findings of the ER Review from November 2018 was also undertaken to meet this objective.




The Audit Criteria and scope included the following processes and elements:

- Planning approvals and Compliance Tracking:
  - Review of compliance tracking for Preliminary (40% design) and Barangaroo 100% design
- Meeting key design objectives / drivers;
  - Customer Centric Design
  - Connectivity
  - Crime Prevention through Environmental Design (CPTED)
  - Heritage
  - Environment and Sustainability
- Internal Planning and compliance Reviews;
  - Processes for internal planning and compliance reviews against requirements
  - Processes to integrate and address internal stakeholder and reviewer comments
  - Processes to provide other subject matter expert input, incorporation into design
- External stakeholders, independent review
  - Interfaces and planning with external stakeholders for independent reviews – Design Review Panel, Consultants etc
  - Design Review issues resolution

The audit scope focused on areas considered to be relevant to ensuring that design objectives / drivers and compliance obligations are met at the preliminary design stage and will provide the basis for ongoing compliance for final design and construction. This audit did not assess in detail, the planning approvals which will be retained by Sydney Metro.

## 1.4 Summary of Findings

The table below provides a summary of key findings noted in this audit and the priority assigned to these findings.

Ref	Description	Priority*
GP1-3	<p>A number of strengths and <b>good practices</b> were observed, including:</p> <ul style="list-style-type: none"> <li>• Robust document workflow systems and document controls such as ProjectWise;</li> <li>• Effective collaboration with key stakeholders;</li> <li>• Detailed consideration of design objectives and drivers, particularly in the area of Customer Centred Design (CCD).</li> </ul>	
1	<p>With the recent discovery of heritage material at Barangaroo, opportunities exist for incorporating this into interpretive displays. Metron could consider how the heritage material can be incorporated into the Stage 2 detailed design to maximise the opportunities.</p>	
2	<p>As noted at the review by the ER in November 2017, “Metron was aware of the requirements in the project approval related to flood modelling (E8 and E9) however there was no evidence of flood modelling being undertaken or a clear provision for this to occur”.</p> <p>The current Metron Sustainability Reports for each station sighted during the audit note that “flooding assessment has been undertaken for each station.” The assessments referred to were provided by others (Councils, EIS etc.) and has not included modelling as required by Condition E8. This wording could potentially lead to an assumption by Stage 2 designers that flood assessments including modelling had already been undertaken during Stage 1 design.</p>	

2. \* Priority Definition enclosed as Appendix 2

## 1.6 Overall Assessment

This section summarises the outcomes of the Independent Stage 1 Design Audit conducted on 13 August 2018. The audit took place at the Metron office at Level 39, 680 George Street, Sydney.

Overall, the outcome of this Design audit was positive, with evidence presented that robust processes are in place to meet the requirements of the planning approval, Revised Environmental Mitigations Measures, Design Guidelines, objectives and drivers, Scope and Performance Standards (SPRs) and Scope of Works and Technical Criteria (SWTCs).

Internal compliance tracking against relevant approval requirements appeared appropriate and adequate. It was noted that no changes have been made to the Compliance Tracking Register since the compliance review in November 2018 as Stage 1 design was substantially complete by February 2018.

A number of reports were sighted and reviewed that demonstrate that Metron have taken into consideration, and have embedded the design guidelines, objectives and drivers into the design of the underground stations. The specific objectives / drivers reviewed and verified as appropriate included: Customer Centred Design (CCD); Connectivity, Accessibility, Crime Prevention Through Environmental Design (CPTED), Heritage, and Environment and Sustainability. The CCD report noted that this project is Australia's first application of CCD within the built environment.

Effective collaboration with key internal and external stakeholders was demonstrated through various means including Interdisciplinary Design Reviews (IDR) the Station Working Group (SWG), Sydney Metro & Metron Environment and Sustainability Working Group (ESWG) and the Design Review Panel (DRP). The IDR Register provided detailed evidence of interdisciplinary collaboration

Extensive evidence was provided to demonstrate that an integrated design approach had been adopted, with regular internal and external stakeholder consultation conducted during the Stage 1 preliminary design. The Integrated Design Report - Pitt Street Station includes detailed records of Interface Management and stakeholder consultation. External interfaces included Metron with external design consultants and other third-party stakeholders.

To the extent to which planning approvals are applicable to this early stage of design, this audit determined that the relevant conditions have been appropriately considered and that no areas of non-compliance were identified.

### Report certified by:

*Julie Dickson*

Exemplar Global certified Lead Auditor (13573).

## 2. Detailed Findings and Proposed Action Plan

### 2.1 Audit Findings & Action Plan

The following section of this report provides details of audit findings and the agreed action plan, including allocation of responsibility and timeframes.

Ref	Audit Finding	Risk/Impact	Priority*	Proposed Action Plan
GP1	Robust document workflow systems and document controls (ProjectWise) were in place to control the distribution, approvals and issue of documents and there were appropriate interfaces with the Sydney Metro Teambinder process.	N/A (positive)	Observation	Nil
GP2	Effective collaboration with key internal and external stakeholders was demonstrated through various means including Interdisciplinary Design Reviews (IDR) the Station Working Group (SWG), Sydney Metro & Metron Environment and Sustainability Working Group (ESWG) and the Design Review Panel (DRP).	N/A (positive)	Observation	Nil
GP3	Extensive evidence to demonstrate detailed consideration of design objectives and drivers was provided, particularly in the area of Customer Centred Design (CCD), which involved use of virtual reality for customer testing in initial concept testing and validation of design.	N/A (positive)	Observation	Nil
1	With the recent discovery of heritage material at Barangaroo, opportunities exist for incorporating this into interpretive displays.	Nil Positive opportunity	OFI	METRON could consider how the heritage material can be incorporated into the Stage 2 detailed design to maximise the interpretation opportunities.
2	As noted at the review by the ER in November 2017, “Metron was aware of the requirements in the project approval related to flood modelling (E8 and E9) however there was no evidence of flood modelling being undertaken or a clear provision for this to occur”.  The current Metron Sustainability Reports for each station sighted during the audit note that “flooding assessment has been undertaken for each station.” The assessments referred	Stage 2 Design & Construct contractors may assume flood modelling was already undertaken at Stage 1	OFI	Sydney Metro should ensure that it is made clear to the Stage 2 Design and Construct (D&C) contractors that flood modelling was not undertaken at Stage 1 design (except Victoria Cross).

Ref	Audit Finding	Risk/Impact	Priority*	Proposed Action Plan
	<p>to were provided by others (Councils, EIS etc.) and has not included modelling as required by Condition E8.</p> <p>It is acknowledged that flood modelling was not necessarily required for Stage 1 from the Metron preliminary design scope, however it will be required for the Stage 2 detailed design.</p> <p>The wording in the Sustainability Reports could potentially lead to an assumption by Stage 2 designers that flood assessments including modelling had already been undertaken during Stage 1 design.</p> <p>It is acknowledged that since the ER review, a flood assessment, including modelling has been undertaken at Victoria Cross Station, however not yet at the other stations.</p>			

\* Priority Definition enclosed as Appendix 2

## 2.2 Assessment Details

The following section of this report provides commentary on plans, systems, processes, specifications, reports, strategies, drawings/3D models, registers, other evidence assessed to determine the level of compliance to relevant planning approvals, Revised Environmental Mitigation Measures (REMMs) and Sydney Metro Design Guidelines.

### Overview of design process and Stage 1 outputs:

Robust overall design processes were demonstrated through the document management system “ProjectWise” and the Quality Management and Information Security Plan. Interfaces of internal systems with Teambinder are outlined and workflows for checking, approval and validation are defined. Further evidence of robust design processes was demonstrated through various documents including the Engineering and Design Management Plan (EMDP) which outlines the design management processes used to deliver the USDTs Stage 1 design and an Engineering Assurance Register which tracks compliance to Scope and Performance Standards (SPRs) and Scope of Works and Technical Criteria (SWTCs). Whilst not directly aligned with planning approvals and REMMs, this register supports the requirements to meet the specific design objectives, principles and standards required in Condition E101.

Effective internal and external collaboration with key stakeholders including capture and resolution of issues was demonstrated through various means including Interdisciplinary Design Review (IDR) process.

### Planning approvals and Compliance Tracking:

Internal compliance tracking against relevant approval requirements was appropriate and adequate. It was noted that no changes have been made to the Compliance Tracking Register since the compliance review in November 2018 as Stage 1 design was substantially complete by February 2018. Issues identified during the review are addressed in the above section 2.1 of this report. Detailed tracking of compliance to SPRs (Scope and Performance Standards) and Scope of Works and Technical Criteria (SWTCs) was also maintained through the Engineering Assurance Register. Planning and Environment Reports for Stage 1 Design of Pitt Street Station, Barangaroo Station and Victoria Cross Station confirming compliance with Conditions of Approval (CoA) and Revised Environmental Management Measures (REMMs) and outcomes of Consistency Assessments were sighted and reviewed. In relation to Condition 101 (Station Design and Precinct Plans – SDPPs), Metron has prepared a table indicating how each part of the Condition is met for Stage 1. It was noted that an SDPP template has been prepared by Sydney Metro and this has been forwarded to Department of Planning and Environment. It will be the responsibility of Stage 2 contractors to prepare the SDPPs using the template as a guide.

### Meeting key design guidelines / objectives / drivers:

A number of reports were sighted and reviewed that demonstrate that the design guidelines, objectives and drivers have been taken into consideration in the design of the underground stations. For the specific objectives / drivers reviewed, pertinent information regarding the reports and other evidence are outlined under each heading below. Evidence of collaboration and consultation was demonstrated through the consolidated Interdisciplinary Design Register (IDR) and the Barangaroo Stn Stg 2 & 3 Post Stage 1 comments spreadsheet. Evidence on addressing the requirements of the Design Guidelines, objectives and drivers was demonstrated through the Engineering Assurance Register (EAR) for each station with a focus on Barangaroo.



### Customer Centred Design

A customer centred design (CCD) report provided detailed analysis of virtual reality testing conducted by a Metron CCD team consisting of a multi-disciplinary team comprising customer experience, human factors and pedestrian modelling subject matter experts. The report noted that the CCD team was embedded within the station design teams so that the customer experience was advocated throughout the design process and that this project is Australia's first application of CCD within the built environment.

### Connectivity

Connectivity was addressed generally within the Architectural Design Reports for each station. Due to the sensitivity of the Barangaroo station precinct, current plans are that Metron will be progressing the design process from preliminary Stage 1 design through to Stage 2 100% design, and a contract will be let for construction only. The Architectural Design Report for Barangaroo provides information relating to public domain restraints, which includes a highly sensitive heritage precinct with respect to the next stage of design feasibility and integration of the primary station plaza into the Nawi Cove and Hickson Road context. At the time of the audit, discussions on station entries were still underway, and significant changes may be required.

### Accessibility

Evidence that accessibility is appropriately addressed was primarily through two reports – DDA (Disability Discrimination Act) – Barangaroo Station report and the BCA (Building Code of Australia) – Barangaroo Station report. The DDA Report is a desktop review of the progressive schematic design documentation and provides a summary of the compliance strategy of the proposed works highlighting the key principles of accessibility, as well as the technical requirements of a transport building to ensure the public and staff have equitable and dignified use. The report relates progressive schematic design review against the project brief Scope and Performance Requirements (SPRs) and the legislative requirements.

The BCA Report focuses on technical BCA issues such as fire access/ egress and access for people with disabilities.

### Crime Prevention Through Environmental Design (CPTED)

The principles of CPTED are contained within the Security and CPTED Report and evidence of implementation was demonstrated through a Security Design Overview Statement, which provides a review of the issues and Stage 1 design summary, and Stage 2 recommendations by subject matter expert / consultant based in the UK. Evidence of involvement in the Interdisciplinary Design Review process was sighted. Due to confidentiality, documents are not made available to tenderers, however selected persons are permitted to review a special interactive on security.

### Heritage

Appropriate evidence was provided through Heritage Strategy reports for each station location for the Metron Stage 1 design to demonstrate that heritage has been considered through design in accordance with the Design Guidelines and that heritage interpretation has been incorporated into the design of the

project in accordance with REMM NAH8. The Heritage Strategy reports provide references to the relevant guidelines and standards and identify opportunities of relevance to each station area.

### Environment and Sustainability

Metron provided appropriate evidence to demonstrate that consideration have been given at Stage 1 design to achieving best practice level of performance to achieve a design infrastructure Sustainability (IS) rating score of 65 as required by Condition E71. The rating will need to be evaluated and tracked throughout Stages 2 and 3. To meet REMM SUS2, Metron have also made commitments to achieving individual Green Star ratings at each of the underground stations.

Metron have prepared an overall USDTs Sustainability Strategy to define the sustainability requirements and deliverables applicable to the Stage 1 scope of works as required by Condition E72. The Strategy includes recommendations of the Stage 1 sustainability scope applicable to 40% design.

The Sustainability Reports for each of the stations details the Stage 1 pathway to achieve the mandated 5-Star Sydney Metro Custom Green Star Design and As Built rating and other key sustainability targets that form part of the Project's Scope and Performance Requirements (SPR) of Appendix 50a – Sustainability. It should be noted that project requirements not directly applicable to Stage 1 would need to be demonstrated in subsequent project phases and be reviewed for their achievability and compliance. The reports demonstrate the pathway taken for Stage 1 to ensure requirements can be met in Stages 2 and 3 of the project.

Sustainability content was also included in the key discipline Stage 1 design reports (Architecture, Building Services, Civil Engineering, Structural Engineering).

Audit Findings on climate change risk treatment relating to flood modelling referred to in REMM SUS4 and Condition E8 is covered in section 2.3 “Previous “compliance review” findings follow-up”.

### Internal planning and compliance reviews:

Effective collaboration with key internal and external stakeholders was demonstrated through various means including Interdisciplinary Design Reviews (IDR) the Station Working Group (SWG), Sydney Metro & Metron Environment and Sustainability Working Group (ESWG) and the Design Review Panel (DRP). The IDR Register provided detailed evidence of interdisciplinary collaboration that included reviewer comments, rating impact, designer responses, agreement to responses and open/closed status. A Consolidated Comments and Responses Sheet detailing Architectural, Building Services, Civil Engineering and, Structures comments, also provided evidence of collaboration and consultation.

The Engineering Assurance Register (which includes around 20,000 entries of SPR and SWTC requirements) provides detailed evidence of review of compliance requirements. Whilst the Register does not specifically include Planning Conditions of Approval and REMMs, a review of the register found that the SPRs and SWTCs incorporate the majority of the Planning Approval compliance requirements, though it is recognised there would be some gaps. The Register includes fields for requirement owner, compliance status, justifications for departure (if applicable) and verification evidence. The Compliance Tracking spreadsheet documents the compliance to approval conditions and REMMs.

As noted in a previous section on planning approvals and compliance tracking, since the ER review in November 2017, there have been no changes to the Compliance Tracking Spreadsheet, as Stage 1 preliminary design was substantially complete by February 2018.

External stakeholders, independent reviews:

Extensive evidence was provided to demonstrate that an integrated design approach had been adopted, with regular internal and external stakeholder consultation conducted during the Stage 1 preliminary Design. The Integrated Design Report - Pitt Street Station includes detailed records of Interface Management and stakeholder consultation. External interfaces included Metron and other external design consultants and other third-party stakeholders. Interface and consultation records contained within the appendices of the Integrated design report included: Interface Register Extract; OSD Coordination, Station Working Group Meeting Minutes, Design Review Panel Meeting Minutes and Presentation, Sydney Water Feasibility Letter, City of Sydney Council Consultation, FRNSW, MRTC and TSE Meeting Minutes and Consolidated SMDO / MRTC Comments.

### 2.3 Previous “compliance review” findings follow-up

Whilst not a formal audit, an initial independent environmental compliance review for Stage 1 design was undertaken by the Environmental Representative in November 2017 against the CSSI 15\_7400 Infrastructure Approval, the commitments made in the EIS and the Revised Environmental Mitigation Measures. The review focused on Victoria Cross station. The key findings of the compliance review indicated that a robust process was in place to systematically review the allocated conditions, and a number of observations were made regarding how specific conditions or requirements were yet to be met.

The observations were revisited during this audit and it was found that some of the conditions are still to be met, however these would generally be the responsibility of others at the Stage 2 Final Design stage. A summary of the status of these and ongoing recommendations are contained within Table 1 below

**Table 1 Follow-up to prior Compliance Review**

Prior Finding	Metron Response	Audit follow-up comments	Status
1. Approach to consultation with key stakeholders is yet to be determined including interfaces with the TTLG, RMS and other key stakeholders such as relevant public authorities and the NSW Police for security etc.	Consultation with stakeholders is the responsibility of Sydney Metro. METRON representatives are invited to attend meetings with stakeholders by Sydney Metro as required.	Not in Metron scope  SM has set up regular interface meetings with relevant stakeholders where Contractors are able to be involved as appropriate to undertake engagement and seek feedback .	Closed (Based on SM update)
2. There are references to community consultation requirements however it is not clearly articulated how this consultation will be conducted during the design process.	Reviewed however not in Metron’s scope. Findings and conclusions have been referred to Sydney Metro.  Consultation with community is the responsibility of Sydney Metro.	Not in Metron scope  SM will facilitate where required by the various contractors any community consultation requirements with design aspects. Currently, design for the various contracts (e.g. SSJ, CSMW etc) have only just begun with no community consultation requirements.	Closed (Based on SM update)
3. It is not clear what modelling will be required or has been allowed for to meet the requirement of E78 (supplementary analysis and modelling as required by the TTLG).	METRON has undertaken pedestrian modelling to assess pedestrian movements at the access points to the station and within the station. METRON has not undertaken any traffic modelling, but has used Sydney Metro	Response from Metron appears appropriate for the Stage 1 design.	Closed

Prior Finding	Metron Response	Audit follow-up comments	Status
	traffic modelling work to coordinate the configuration of traffic intersections to support access by pedestrians to the stations.		
4. At the time of the review, Metron was aware of the requirements in the project approval related to flood modelling (E8 and E9) however there was no evidence of flood modelling being undertaken as yet or a clear provision for this to occur. It was agreed that flood modelling should be required unless the designers can state with certainty for all elements that nothing has changed that would require flood modelling. Mitigations measures FH4 to FH10 should also be revisited.	METRON's scope does not include flood modelling. To incorporate flood risk into the design, METRON relied on existing and available flood modelling work undertaken by others.	Further investigation was undertaken during this audit. Refer to new finding (Finding No 2)	Remains open (refer to Finding 2 (OFI))
5. It was not clear how the interface between SMDO and the Design Review Panel would operate.	Sydney Metro Delivery Office (SMDO) to clarify.	This was not in the scope of this current audit with Metron.  SMDO has set up and manages the DRP. Contractors present as required certain design elements which are discussed.	Closed (based on SM update)
6. There is evidence of good application of acoustic budgeting to drive project operational performance to operational compliance with respect to noise. There is an opportunity to confirm the modelling of project performance with respect to operational vibration requirements (e.g.: operational train vibration).	Operational compliance verification is beyond the scope of METRON. Sydney Metro to confirm approach.	This was not in the scope of this current audit with Metron.  SM have set up an Acoustic Working Group and have obtained the services of an Acoustic Design and Assurance Consultant. This group and role are project focused and are tasked with integrating and overseeing the noise and vibration aspects of all contracts of work.	Closed (based on SM update)

Prior Finding	Metron Response	Audit follow-up comments	Status
<p>7. There was an opportunity to update visual impact assessments where required due to significant changes in design. Metron recommended that any updated visual assessment should be undertaken by EIA Visual Impact Assessment (VIA) team to ensure consistency of approach.</p>	<p>If updated VIA is required, this should be undertaken by Sydney Metro's VIA consultant (i.e. the consultant who did the VIA for the EIS)</p>	<p>This was not in the scope of this current audit with Metron.</p> <p>Visual impact is included in the Architectural Design reports developed as part of the design process undertaken by Metron for Stage 1 design. The visual impact of the design is also discussed and evaluated during the DRP briefings and will be developed further during Stage 2 and 3 design.</p>	<p>Closed (based on SM update)</p>

## Appendix 1: Audit information

The following indicates key systems, documents, reports, information and records that were reviewed, accessed or sighted during the audit process:

Documentation	Information / Records
1. Overview of Design process and Stage 1 outputs	
NWRLSRT-MET-SRT-PM-PLN-000002 Engineering and Design Management Plan (EMDP) Section 5 Design Process	
Quality Management Plan (QMP) process NWRLSRT-MET-SRT-PM-PLN-000003 Section 6.1.3 Checking Documents	
Design Report – Architectural – Barangaroo Station (SBR) - NWRLSRT-MET-SBR-AT-REP-000011 Annexure 03 7.3 Preliminary Specification (system wide - applicable to SBR, SVC, SPS, SCN and SWS)	
Integrated Design Report Pitt Street Station - NWRLSRT-MET-SPS-ID-REP-000001	
Construction Staging and Sequencing Barangaroo Station - NWRLSRT-MET-SBR-ST-REP-000022 – 2/11/17	
Sydney Metro City & Southwest - Chatswood to Sydenham Design Guidelines – Part A and Part B (Sept 2016 – TfNSW_	
2. Follow-up on findings of the ER Compliance Review from Nov 2017	
Initial Compliance Review – Underground Station Design and Technical Services (USDTS) Stage 1 Design 8 November 2017.	APP A_USDTS_Planning Approvals_Compliance Tracking_Working Version_20171109
	Jo Robertson audit follow-up items_METRON response (14 Aug 2018)
	Email – Brian Cullinane 15/08/18 “Re: Document request - post Design Audit” re: Conditions E107 and E108- extracts from the Civil Engineering Basis of Design Report to clarify responses.
3. Compliance Tracking for Preliminary 40% design	
Planning and Environment Report - Barangaroo Station NWRLSRT-MET-SBR-PL-REP-000001 07/11/17	APP A_USDTS_Planning Approvals_Compliance Tracking_Working Version_20171109
Planning and Environment Report Pitt Street Stn NWRLSRT-MET-SPS-PL-REP-000003	Engineering Assurance Register - Barangaroo Station - NWRLSRT-MET-SBR-AT-RGS-000001 (Exported from DOORS database)

Documentation	Information / Records
Planning and Environment Report Victoria Cross - NWRLSRT-MET-SVC-PL-REP-000001	Condition E101 SDPPs (Word doc - references the Metron documents that address requirement for Station Design and Precinct Plans)
Statutory Planning Report July 2017 - NWRLSRT-MET-SRT-PL-REP-000004	
4. Meeting key design drivers	
CCD (Customer Centred Design) Final Report - NWRLSRT-MET-SRT-CD-REP-000013	Barangaroo IDR3 (Interdisciplinary Design Register) Comment register - NWRLSRT-MET-SBR-ID- RGS-000003
Design Report – Architectural – Barangaroo Station - NWRLSRT-MET-SBR-AT-REP-000011 – 2/02/18	Consolidated Comments and Responses Sheet
DDA Report (Disability Discrimination Act) – Barangaroo Station 13/11/2017 P01 (NWRLSRT-MET-SBR-AC-REP-000001)	Environment and Sustainability Working Group minutes (various)
Building Code of Australia (BCA) Report - NWRLSRT-MET-SBR-ID-REP-000002 – 23/11/2017	Terms of Reference - Environment & Sustainability Working Group - Sydney Metro & METRON
Barangaroo Sustainability Report (NWRLSRT-MET-SBR-SU-REP-000001   Revision - P03) 16/05/18	Internal Memo Constructability Planning and Environmental Constraints
Victoria Cross Sustainability Report - NWRLSRT-MET-SVC-SU-REP-000001 – 9/05/2018	Barangaroo Stn Architectural Design Project Info Dwg list
Pitt Street Station Sustainability Report - NWRLSRT-MET-SPS-SU-REP-000001 6/07/2018	Design drawings (4) including: NWRLSRT-MET-SBR-AT-DWG-000031, 37, 63, 332
Crows Nest Station Sustainability Report (NWRLSRT-MET-SCN-SU-REP-000001 - 21/05/18	
USDTs Sustainability Strategy - NWRLSRT-MET-SRT-SU-REP-000008 – 10/08/17	
Victoria Cross Flood Management Addendum – Incorporating Sydney Water Requirements and Potential Design Options - NWRLSRT-MET-SVC-CE-REP-000005 - 06/04/18	
Security and CPTED Report: NWRLSRT-MET-SPS-SC-REP-000001 Barangaroo (sighted but copy not retained due to security/confidentiality)	
Heritage Strategy for Barangaroo - NWRLSRT-MET-SBR-HE-REP-000001 P02 23/11/17	



Documentation	Information / Records
Heritage Strategy for Victoria Cross - NWRLSRT-MET-SVC-HE-REP-000001 12/01/2018	
Integrated Design Report Pitt Street Station - NWRLSRT-MET-SPS-ID-REP-000001 17/05/2018	
5. Internal planning and compliance reviews	
	Barangaroo IDR3 (Interdisciplinary Design Register) Internal Comment register - NWRLSRT-MET-SBR-ID- RGS-000003
	Pitt Street Consolidated Comments Register NSWRSRT-MET-SPS-ID-RGS-000005 – 15/06/2018
	Environment and Sustainability Working Group minutes (18/10/2017 and various)
	Constructability Planning and Environmental Constraints - Construction Environmental and Planning Constraints NWRLSRT-MET-SRT-PL-REP-000002 – 20/06/17
	APP A_USDTS_Planning Approvals_Compliance Tracking_Working Version_20171109
	Barangaroo Station Stage 2 & 3 - Post Stage 1 Comments - NWRLSRT-MET-SBR-ID-RGS-000012
6. External stakeholders, independent reviews	
Integrated Design Report Pitt Street Station - NWRLSRT-MET-SPS-ID-REP-000001 (DRP Minutes and External Comments Register contained within appendices)	DRP Minutes (in Integrated Design Report appendices)
	External Comments Register - (in Integrated Design Report appendices)
	City of Sydney Meeting Attendance Record – (Pitt Street)

## Appendix 2: Priority Definition

The priority for findings raised in this report is described in the table below.

Priority	Definition	Guidelines for Implementing Actions
<b>Very High</b>	A significant control weakness / issue or fundamental non-compliance that exposes the project or area under review to a very high level of risk	Requires immediate management attention, with actions plans to be developed and enforced within an agreed time frame. The matter will be escalated immediately to senior management from all parties
<b>High</b>	A control weakness / issue or non-compliance that may expose the project or area under review to a high level of risk	Action plans to be developed and implemented within an agreed time frame. The matter will be escalated to relevant senior executives where it is deemed necessary
<b>Medium</b>	A control weakness / issue or non-compliance that may expose the project or area under review to a moderate level of risk	Action plans to be developed and implemented within an agreed time frame
<b>Low</b>	A control weakness / issue or non-compliance that may expose the project or area under review to a low level of risk	Action plans to be developed and implemented within an agreed time frame
<b>OFI</b>	Opportunity For Improvement (OFI) – opportunity to implement a good or better practice to improve efficiency or further reduce exposure to risk	Suggestion to be considered for implementation
<b>Observation</b>	Good Practice – process / system in place and implemented effectively across business.	Maintain to current standard. Share with other areas of business.

### Appendix 3: Personnel Consulted and Timeline

We would like to extend our appreciation to the following individuals involved this audit:

Name	Title
Michael Barron	Design Director - METRON
Brian Cullinane	Planning Discipline Lead - METRON
Muir Livingstone	Architectural Lead - METRON
Ben Armstrong	Senior Manager, Environment, City and South West

The timeline is shown in the table below.

Milestone	Date
Issuance of Audit Notification Plan and Audit Checklist	7 August 2018
Briefing Meeting	13 July 2018
Desktop Audit	10 August 2018
Audit including Opening Meeting	13 August 2018
Issuance of Draft Report	27 August 2018
Issuance of Final Report	29 August 2018

### Appendix 4: Audit attendance register

#### AUDIT ATTENDANCE REGISTER

AUDITEE: METRON AUDIT: SM18.19-060-CSW-MET-ENV SITE: Level 39, 680 George Street, Sydney			13 August 2018	
NAME (print)	POSITION & ORGANIZATION		ENTRY (Initials)	EXIT (initials)
Julie Dickson	Lead Auditor	QEM	<i>JD</i>	<i>JD</i>
Brian Cullinane	Director EMS Advisory) for METRON <i>Planning Discipline lead.</i>	EME Advisory	<i>BC</i>	<i>BC</i>
Michael Barron	Design Manager <i>Design Director</i>	METRON	<i>MB</i>	
Muir Livingstone	Architectural Lead	METRON	<i>ML</i>	
Ben Armstrong	Senior Manager Environment City and Southwest	CS&W Sydney Metro	<i>BA</i> 9.30 am.	<i>BA</i> 2.30 pm.

## Appendix 5: Audit Credentials

### Audit process

The Independent Environmental Audit comprised a desktop review, and a one day desktop review at the Metron project office, which was conducted by Julie Dickson, of QEM Consulting Pty Ltd. The audit comprised an assessment of documentation and records conducted at the METRON office at Level 39, 680 George Street Sydney. The audit utilised an assignment specific Audit Checklist based on the Planning Approvals in Design, including compliance review & prior audit findings, focusing on Barangaroo Station (Criteria: EIS, MCoAs, REMMs & SM Design Guideline) which are material for the Stage 1 preliminary design. Requirements were then verified as being implemented and/or compliant, based on records and objective evidence, the entire process undertaken in accordance with AS / NZS / ISO 19011:2014 – Guidelines for Auditing Management Systems..

### Auditor information

<b>Audit Organisation:</b>	QEM Consulting Pty Ltd
<b>Auditor &amp; Report Author</b>	Julie Dickson
<b>Auditor Qualification</b>	Lead EMS and Environmental Compliance Auditor, Exemplar Global Certification 13573
<b>Affiliations</b>	Certified Environmental Practitioner (EIANZ) Reg No: #221 MEIANZ

### Auditor certification

The abovementioned Auditor certifies as having personally undertaken this Independent Audit and preparing the contents of this Independent Environmental Audit Report; and that the findings of the audit are reported truthfully, accurately and completely; and that she has exercised due diligence and professional judgement in conducting the audit. The signed Statement of Interests and Association in our services agreement with Sydney Metro confirm our Auditor's independence and absence of pecuniary interest in the audited project.

### Audit disclaimer

It should be noted that this report is a snapshot in time, based on selected and supplied evidence, and does not purport to be a definitive confirmation of overall compliance or vice-versa.