

Schedule C1. Scope of Works and Technical Criteria

(Clauses 1.1, 1.4, 2.9, 3.9, 4.8, 5.2, 5.3, 7.1, 7.9, 17.19)

The SWTC comprises the following documents:

Scope of Works and Technical Criteria and the following appendices:

- Appendix 1 Definitions and acronyms
- Appendix 2 SWTC drawings
- Appendix 3 Interface schedule
- Appendix 4 Signalling Functional Specification
- Appendix 5 Asset Management
- Appendix 6 Indra Specification



Sydney Metro – City & Southwest

Sydney Yard Access Bridge Project Contract Schedules

Schedule C1
Scope of Works and Technical Criteria
(SWTC)

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Contents

1	Introduction	2
1.1	Overview of the Sydney Yard Access Bridge Project	2
1.2	Project Objectives	2
1.3	Purpose and Interpretation of SWTC	4
1.4	Definitions and Interpretations	4
1.5	Structure of this SWTC	5
2	Scope	6
2.1	Contractor's Activities	6
2.2	Works	7
2.3	Temporary Works	10
3	General Requirements	12
3.1	Site	12
3.2	Effect of the Works, the Temporary Works and the Contractor's Activities	12
3.3	Site Investigation	13
3.4	Condition Surveys	14
3.5	Survey	16
4	Technical activities, scope and requirements	17
4.1	General	17
4.2	Design Life	17
4.3	Design Criteria	19
4.3.1	General	19
4.3.2	Structural Works	25
4.3.3	Civil Works	25
4.3.4	Urban Design and Landscape	26
4.3.5	Materials, Finishes, Fixtures and Fittings	27
4.4	Utility Services	28
4.4.1	General	28
4.4.2	Existing Rail Utility Services	29
4.5	Stormwater Drainage	29
4.6	1500V Overhead Wiring (OHW) and Overhead Wiring Structures (OHWS)	31
4.7	Signalling	32
4.8	Railway Track	32
4.9	Low Voltage (LV) Distribution system	33
4.10	Earthing, Bonding and Electrolysis Protection	33
4.11	Lighting	34
4.12	Security Measures	35
4.12.1	Fencing and Gates	35
4.12.2	Electronic Access Control Systems (EACS)	35
4.12.3	Closed Circuit Television	36
4.12.4	Operation Critical Data Network (OCDN)	37
4.12.5	Gate intercom	37
4.13	Signage	37
4.14	Temporary maintenance level crossing	37
5	Construction Requirements	39
5.1	General	39

Delete This Text – Keep Blank page if Table of Contents is an uneven (1, 3, 5 etc) number of pages. Otherwise delete section break below.

5.2	Work Methods and Training	39
5.3	Special Events	39
5.4	Demolition	39
5.5	Stockpiling of Materials	40
5.6	Redundant infrastructure	40
5.7	Construction Vehicle Loads	40
5.8	Temporary Site Facilities	41
5.9	Site Facilities for the Principal	41
5.10	Hoardings, Fencing, Walls and Signage	41
5.11	Site Protection and Restoration	42
5.12	Discharge Water Quality	42
5.13	Maintenance During Construction	42
5.14	Acid Sulphate Soils and Rocks	43
5.15	Contamination	43
5.16	Road Conditions	43
5.17	Traffic and Transport Management	43
5.18	Property Access and Utility Services	44
5.19	Unfixed materials in Sydney Yard	44
5.20	Noise and Vibration	44
Appendix 1	Definitions and acronyms	2
Appendix 2	SWTC drawings	3
Appendix 3	Interface schedule	4
Appendix 4	Signalling Functional Specification	5
Appendix 5	Asset Management	1
Appendix 6	Indra Specification	2

1 Introduction

1.1 Overview of the Sydney Yard Access Bridge Project

- (a) Sydney Metro City & Southwest is a new 30km metro line extending metro rail from the end of Sydney Metro Northwest at Chatswood under Sydney Harbour, through new CBD stations and southwest to Bankstown. It is due to open in 2024 with the capacity to run a metro train every two minutes each way through the centre of Sydney.
- (b) The Sydney Yard access bridge (SYAB) project forms part of the Sydney Metro City & Southwest project.
- (c) At the date of the Contract, access to Sydney Yard is limited to medium-sized vehicles from Eddy Avenue via Central Station platform 15, and heavy vehicles from the vicinity of Mortuary Station via an at-grade ballast access crossing over the inter-city running lines during track possessions.
- (d) The SYAB is a new permanent road bridge that will provide a connection from Regent Street into the Sydney Yard. In particular, the SYAB will extend from Regent Street over the Mortuary Station line and intercity tracks into the Sydney Yard.
- (e) The users of the SYAB will include:
 - (i) the contractors responsible for the construction of the Sydney Metro City & Southwest works at Central Station;
 - (ii) the contractors responsible for other construction activities at Central Station;
 - (iii) the operator and maintainer of Sydney Metro; and
 - (iv) Sydney Trains and NSW Trains for the purpose of maintenance activities and periodic major projects in and around Sydney Yard.
- (f) SYAB will be owned by TfNSW and, following completion of the Sydney Metro City & Southwest construction works, will be operated and maintained by Sydney Trains or the Sydney Metro operator and will provide an improved access which is grade separated into the Sydney Yard for Sydney Trains and Sydney Metro operations by:
 - (i) avoiding track crossings, usually restricted to Sydney Trains possessions, for the majority of vehicles and loads that need access to the Sydney Yard;
 - (ii) providing a service access point for vehicles to Central Station away from the public entrances;
 - (iii) supporting emergency vehicles access to Central Station; and
 - (iv) improving safety by avoiding construction or maintenance traffic crossing the high traffic pedestrian area at the Eddy Avenue entrance and at the proposed Sydney Light Rail crossing.

1.2 Project Objectives

- (a) The key objectives for the Sydney Metro City & Southwest project are:
 - (i) Objective 1: Improve the quality of the transport experience for customers
 - A. Relevant Principles

1. Personal safety and security.
 2. Customer experience.
 3. Timeliness and reliability.
 4. Place making.
- (ii) Objective 2: Provide a transport system that is able to satisfy long-term demand, and supports the productivity of the global economic corridor
- A. Relevant Principles
1. Achieving greater productivity.
 2. Designing for future growth.
- (iii) Objective 3: Grow public transport patronage and mode share
- A. Relevant Principles
1. Transport integration.
 2. Priority of access.
- (iv) Objective 4: Serve and stimulate urban development
- A. Relevant Principles
1. City shaping.
 2. High quality design.
- (v) Objective 5: Improve resilience of the transport network
- A. Relevant Principles
1. Maintainability
- (vi) Objective 6: Improve the efficiency and cost effectiveness of the public transport system
- A. Relevant Principles
1. Rail operations and maintenance.
- (vii) Objective 7: Implement a feasible solution recognising impacts constraints and delivery risk
- A. Relevant Principles
1. Climate responsibility.
 2. Environmental responsibility.
 3. Protecting biodiversity and heritage.
 4. Social responsibility.
- (b) Having regard to the Sydney Metro City & Southwest project objectives and without in any way limiting the Contractor's obligations under the Contract, the objectives for the Works, the Temporary Works and the Contractor's Activities are to:
- (i) deliver the Works ensuring:
- A. delivery of high quality rail infrastructure;
 - B. delivery of the Works safely;
 - C. minimising impacts on the environment and community;
 - D. achievement of delivery dates;
 - E. avoidance of unplanned disruption to the rail network operations;

- F. value for money in delivering the requirements of the Works and the whole of life cost;
 - G. work collaboratively with the Principal and operator / maintainer in managing and minimising impacts to passenger and freight rail operations; and
 - H. ensure the Contractor's Activities are delivered to TfNSW's high standards in stakeholder engagement and environmental management;
- (ii) provide a controlled, heavy vehicle access bridge from Regent Street into the Sydney Yard to facilitate the construction of the Sydney Metro City & Southwest works at Central Station;
 - (iii) provide permanent access to the Sydney Yard and adjacent rail and other infrastructure for emergency vehicles, rail infrastructure maintenance and other ongoing Sydney Metro City & Southwest and Sydney Trains rail operations;
 - (iv) ensure heritage and architectural treatments to the SYAB reflect the location and scale of the built structure and surroundings, including features that contribute to the surrounding visual environment and historic significance of the Central Station railway precinct;
 - (v) minimise impacts on stakeholders and the community; and
 - (vi) achieve Completion of each Milestone by the relevant Date for Completion.

1.3 Purpose and Interpretation of SWTC

- (a) The criteria and requirements in this SWTC are minimum criteria and requirements, including technical, operational and performance criteria and requirements for the Works, the Temporary Works and the Contractor's Activities which the Contractor must satisfy to fulfil its obligations under the Contract.
- (b) If more than one criterion or requirement applies in respect of any part of the Works, the Temporary Works and the Contractor's Activities then all criteria and requirements must be satisfied. If there are criteria and requirements which are mutually exclusive, then the criterion or requirement which delivers the greatest level of service or is of the highest standard, will apply.
- (c) Reference to any work includes any additional activities necessary for the satisfactory completion and performance of that work and full compliance with these criteria and requirements.
- (d) The Contractor bears the risk that compliance with this SWTC will not fulfil the Contractor's obligations under the Contract. In particular, the Contractor will be required to carry out any work, tasks and activities additional to that contemplated by this SWTC to ensure that the Contractor satisfies its obligations under the Contract.

1.4 Definitions and Interpretations

- (a) Unless the context requires otherwise, terms which have a defined meaning in the General Conditions have the same meaning where used in this SWTC.
- (b) Appendix 1 contains definitions of terms and acronyms used in the SWTC that are not set out in the General Conditions.
- (c) Unless stated otherwise, any reference to a 'section' or 'clause' in this SWTC is a reference to a section or clause of this SWTC.

- (d) Unless stated otherwise, any reference to an 'Appendix' or 'Appendices' in this SWTC is a reference to an Appendix or Appendices of this SWTC.
- (e) Unless stated otherwise, any reference to a 'Worksite' or 'Worksites' in this SWTC is a reference to a Worksite or Worksites set out in Schedule E1.
- (f) The SWTC including the Appendices must be read in conjunction with all other parts of the Contract.
- (g) Unless stated otherwise, all reduced levels specified in this SWTC, including those in the Appendices, are to Australian Height Datum (AHD).
- (h) Unless stated otherwise, all survey coordinates specified in this SWTC, including those in the Appendices, are to the Map Grid Australia (MGA-GDA-94).

1.5 Structure of this SWTC

In this SWTC:

- (a) section 2 includes the scope of the Contractor's Activities, the Works, including the principal items of infrastructure to be delivered by the Contractor, and the Temporary Works;
- (b) section 3 includes the general requirements that the Contractor must comply with;
- (c) section 4 includes the design and technical requirements for the Works;
- (d) section 5 includes the construction requirements that the Contractor must comply with.

2 Scope

2.1 Contractor's Activities

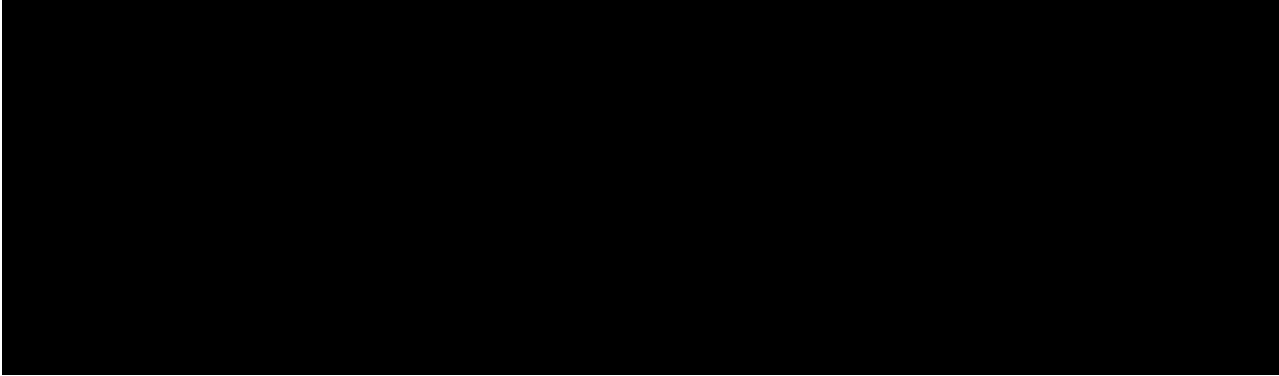
- (a) The Contractor must undertake the Contractor's Activities in accordance with the requirements of the Contract, including this SWTC, and the Planning Approval.
- (b) The Contractor must implement a totally integrated approach to the performance of the Contractor's Activities using effective and robust systems which accommodate and address performance, stakeholder, community, sustainability and environmental requirements.
- (c) In particular, the Contractor must:
 - (i) satisfy the technical and procedural requirements of the Principal with respect to investigation, design and construction and handover of the Works;
 - (ii) demonstrate an appropriate application of whole of life considerations in the design and construction of the Works;
 - (iii) establish and maintain a positive relationship with the Principal, Interface Contractors, stakeholders and the community;
 - (iv) ensure that its planning and programming is comprehensive and provides for the concurrent delivery of the performance and environmental requirements of the Contract;
 - (v) ensure that risks are managed throughout the performance of the Contractor's Activities;
 - (vi) proactively liaise with and satisfy the requirements of all relevant Authorities; and
 - (vii) diligently address safety, function, durability, sustainability and reliability and aesthetics in all aspects of the Works, the Temporary Works and the Contractor's Activities.
- (d) Without in any way limiting the Contractor's obligations under the Contract, the Contractor's Activities include all tasks and things necessary to:
 - (i) investigate, design, construct, test and commission the Works and any Temporary Works;
 - (ii) preserve and protect all existing infrastructure including structures, public transport facilities including bus driver amenities and associated facilities, cycleways, footpaths, Utility Services, roads, railways, buildings and improvements, that are affected by the Contractor's Activities, except for the existing infrastructure that is required to be demolished or modified under the Contract;
 - (iii) handover the Works to the Principal or relevant owner by the relevant Dates for Completion in the condition required by the Contract;
 - (iv) correct all Defects during the Defects Rectification Period applicable to the relevant parts of the Works;
 - (v) secure, maintain, repair, reinstate and hand back, in the specified condition, areas occupied or affected by the Temporary Works;

- (vi) prepare all Design Documentation and prepare all Contractor's Programs;
- (vii) provide quality assurance of the Contractor's Activities;
- (viii) enable the Environmental Representative to perform its functions;
- (ix) mitigate environmental impacts during the design and construction of the Works and the Temporary Works;
- (x) develop and implement sustainability strategies and initiatives for the Contractor's Activities and the Works and the Temporary Works;
- (xi) implement all necessary traffic and transport management methods to effectively manage traffic and transport affected by the construction of the Works and the Temporary Works;
- (xii) develop, implement and maintain the project plans in accordance with the Contract;
- (xiii) provide effective stakeholder and community involvement, including effective communication, in relation to the Works and the Temporary Works and the Contractor's Activities;
- (xiv) maintain and repair the Works until the relevant Date for Completion;
- (xv) maintain and repair the Temporary Work;
- (xvi) prepare and provide all asset management information in accordance with the Appendix 5; and
- (xvii) implement the methodologies set out in Schedule D2.

2.2 Works

- (a) The Works include all permanent new infrastructure and modifications to existing infrastructure which must be constructed to enable the Contractor to satisfy the requirements of the Contract.
- (b) The permanent new infrastructure and modifications to existing infrastructure to be constructed include:
 - (i) the SYAB including:
 - A. substructure, including:
 - 1. piling;
 - 2. earth retaining bridge approach structure;
 - 3. barriers;
 - 4. abutments;
 - 5. piers; and
 - 6. bearings;
 - B. superstructure, including:
 - 1. precast and insitu concrete elements;
 - 2. on ramps;
 - 3. bridge steelwork;
 - 4. bridge decking;
 - 5. barriers;

- 6. drainage; and
- 7. provision for Utility Services;
- C. heritage and architectural treatment;
- D. protection screens;
- E. safety screens;
- F. provisions for future Utility Services; and
- G. bridge lighting;
- (ii) hinged approach slabs to accommodate differential settlement at each end of the SYAB ("**Approach Slabs**");
- (iii) an entrance road between the Approach Slab at the southern end of the SYAB and Regent Street ("**Regent Street Entrance Road**"), including:
 - A. road pavements and line marking;
 - B. signage;
 - C. road furniture;
 - D. kerb and gutters; and
 - E. lighting;
- (iv) if required by the Contractor's design, a road between the Approach Slab at the northern end of the SYAB and Sydney Yard Landing Slab ("**Yard Access Road**");
- (v) an on-ground slab in Sydney Yard immediately adjacent to the Yard Access Road, or the northern Approach Slab if the design does not include a Yard Access Road ("**Sydney Yard Landing Slab**");



- (vii) a new LV power supply system for the:
 - A. the new security measures for Sydney Yard which require power
 - B. the SYAB lighting; and
 - C. Regent Street Entrance Road lighting;
- (viii) adjustments to existing Rail Corridor boundary fencing necessary as a consequence of the construction of SYAB;
- (ix) adjustments to or removal of Sydney Yard OHW infrastructure which are necessary as a consequence of the construction of the SYAB. The adjustments or removals may include:
 - A. new OHW and OHWS;

- B. the removal of OHW and OHWS made redundant by the Contractor's Activities;
 - C. modification of existing OHW and OHWS; and
 - D. the removal of existing Mortuary Siding and Up Shunting Neck OHW and OWHS;
- (x) adjustments to the Sydney Yard Railway Track which are necessary as a consequence of the construction of the SYAB. The adjustments may include:
- A. the shortening of the Up Shunting Neck, including associated rail formation and drainage infrastructure;
 - B. a new friction buffer stop;
 - C. track and catch point alterations necessary for the buffer stop; and
 - D. realignment and/or replacement of existing railway;
- (xi) adjustments to Sydney Yard signalling infrastructure which are necessary as a consequence of the construction of the SYAB and the adjustments to the Sydney Yard Railway Track;
- (xii) adjustments to existing Utility Services in Sydney Yard, including associated combined services route and local cables routes:
- A. which are necessary as a consequence of the construction of the SYAB, the northern Approach Slab to SYAB, the Yard Access Road, the Sydney Yard Landing Slab and the associated adjustments to the Sydney Yard signalling, permanent way and OHW system; and
 - B. to accommodate a future temporary maintenance level crossing in Sydney Yard near Mortuary Station to be constructed by others;
- (xiii) earthing, bonding and electrolysis protection systems necessary for the protection of all infrastructure constructed or modified by the Contractor;
- (xiv) adjustments to signage in Sydney Yard necessary as a consequence of the construction of the SYAB and associated adjustments to Sydney Yard rail infrastructure;
- (xv) adjustments to infrastructure within, or adjacent to, the Site which is affected by the construction of the SYAB, Approach Slabs, Regent Street Entrance Road, the Yard Access Road and the hardstand area, including:
- A. the demolition of all built features on Worksite A; and
 - B. the demolition of impacted built features in Sydney Yard;
- (xvi) urban features and landscaping works on Worksite A;
- (xvii) adjustments to Regent Street and public domain which are affected by the construction of the Regent Street Entrance Road. The adjustments may include modifications to:
- A. street lighting;
 - B. road pavements and line marking;
 - C. signage;
 - D. road furniture;
 - E. kerb and gutters;

- F. footpaths;
- G. drainage; and
- H. landscaping works;
- (xviii) adjustments to existing Utility Services necessary as a consequence of the construction of the Regent Street Entrance Road and adjustments to existing public roads and public domain set out in section 2.2(b)(xvi) above, which may include modifications to:
 - A. stormwater drainage Utility Services;
 - B. electricity Utility Services;
 - C. communications Utility Services;
 - D. potable water Utility Services;
 - E. sewage Utility Services; and
 - F. gas Utility Services;
- (xix) all environmental safeguards and measures necessary to mitigate environmental impacts during operation of the SYAB; and
- (xx) removal and disposal of existing infrastructure made redundant by the Contractor's Activities.

2.3 Temporary Works

The Temporary Works include:

- (a) temporary arrangements to divert and control pedestrians, public transport users, cyclists, public transport and traffic and to provide public access, amenity, security and safety during all stages of design and construction of the Works;
- (b) temporary arrangements for people and vehicles to safely access all property, including publicly accessible space affected by the Contractor's Activities;
- (c) temporary arrangements for people and vehicles to safely access the Site;
- (d) temporary access stairs, walkways and platforms within the Site;
- (e) temporary construction hoardings, fencing, noise walls, access gates and barriers on and around the Site;
- (f) all environmental safeguards and measures necessary to mitigate environmental effects which may arise during the design and construction of the Works;
- (g) cleaning, maintenance, repair, replacement and reinstatement, as required, of all areas occupied by the Contractor during design and construction of the Works;
- (h) temporary site facilities required for design and construction of the Works, including those set out in section 5.9;
- (i) temporary infrastructure, safety screens and ground support installed or erected to undertake design and construction of the Works;
- (j) temporary arrangements for Utility Services including water, electricity, stormwater, sewerage, gas and electronic communications;
- (k) temporary groundwater and stormwater collection, treatment and discharge systems and measures required to achieve discharge water quality required by all relevant Authorities and Approvals;

- (l) temporary works and measures required as a consequence of requirements arising from the stakeholder and community liaison process; and
- (m) all other temporary works and measures required for the construction of the Works.

3 General Requirements

3.1 Site

The SYAB must be designed and constructed to lie completely within the part of the Site comprised of Worksites A, B, C and D.

3.2 Effect of the Works, the Temporary Works and the Contractor's Activities

- (a) Subject to section 3.2 (b) and except for infrastructure which is to be demolished, the Contractor must ensure the Works, the Temporary Works and the Contractor Activities do not damage or have any adverse impact on the condition or performance of any infrastructure on, in, or adjacent to or in the vicinity of the Site (including structures, roads, railways, retaining walls, bridges, Utility Services and buildings) or any existing properties adjacent to or in the vicinity of the Site including any adverse impact on:
- (i) amenity;
 - (ii) aesthetics;
 - (iii) durability;
 - (iv) structural integrity;
 - (v) function;
 - (vi) user benefits;
 - (vii) health and safety during construction and operation;
 - (viii) environmental performance; and
 - (ix) access to such infrastructure or existing properties.
- (b) The Contractor may be relieved of the requirements of section 3.2 (a) to the extent that it satisfies the requirements of any infrastructure owner, Utility Services owner, property owner or occupier, having regard to relevant standards and practices and the nature of the damage or adverse impact.
- (c) The Contractor must undertake a detailed engineering analysis to predict the effects (the "**Predicted Effects**") of the Works, the Temporary Works and the Contractor Activities on existing ground conditions and infrastructure (including but not limited to structures, roads, railways, retaining walls, bridges, Utility Services and buildings). The analysis must also ensure that the predicted movements, vibration and stray current effects will satisfy the requirements of section 3.2 (a) or section 3.2 (b) This analysis must be documented in a report and submitted with the Design Documentation.
- (d) The detailed engineering analysis must include consideration of the influence of:
- (i) excavation and earthworks construction;
 - (ii) piling;
 - (iii) cranes and other heavy plant / temporary works;
 - (iv) geological variations;
 - (v) the impact on groundwater;
 - (vi) the effects over time;
 - (vii) stray currents;
 - (viii) vibration from construction and compaction equipment; and
 - (ix) wheel / rail noise and vibration.

- (e) The Contractor must also determine the extent to which the existing ground conditions and infrastructure may be acceptably affected (the “**Acceptable Effects**”, consistent with satisfying the requirements in subsection 3.2(a) above.
- (f) Throughout the period when the Contractor is undertaking the Contractor's Activities, the Contractor must monitor continuously over time the actual effects of the Works, the Temporary Works and the Contractor's Activities on the ground conditions and infrastructure and compare the actual effects to both the Predicted Effects and the Acceptable Effects.
- (g) Monitoring of the actual effects of the Works, the Temporary Works and the Contractor's Activities on existing ground and infrastructure must be undertaken by qualified and experienced surveyors, geologists, geotechnical engineers, structural engineers, noise and vibration specialists and environmental specialists.
- (h) In the event that the actual effects of the Works, the Temporary Works and the Contractor's Activities on the existing ground conditions and infrastructure exceed the Predicted Effects or significantly vary over time, the Contractor must review and, if necessary, re-evaluate the Predicted Effects and make any adjustment subsequently necessary to any aspects of the manner in which the Contractor's Activities are undertaken to ensure that the Acceptable Effects are not exceeded and to ensure full compliance with section 3.2(a) above.
- (i) Notwithstanding the Predicted Effects on infrastructure contemplated in section 3.2(c) above, the Contractor must repair and reinstate infrastructure at the earliest opportunity so that the Contractor satisfies the requirements in section 3.2(a) above for each item of infrastructure.
- (j) The Contractor must promptly and progressively provide the Principal's Representative with:
 - (i) analysis and determinations, including any revisions, and re-evaluations of the Predicted Effects and the Acceptable Effects;
 - (ii) results of monitoring the actual effects of the Works, the Temporary Works and the Contractor's Activities on the existing ground conditions and infrastructure over time, in a form which is directly comparable to the Acceptable Effects and Predicted Effects;
 - (iii) details of any adjustments to the manner in which the Contractor's Activities are carried out which are necessary as a consequence of any re-evaluation of Predicted Effects; and
 - (iv) details of designs and materials for the repair and reinstatement infrastructure required by section 3.2(h) above.
- (k) The Contractor must submit, prior to the Date of Construction Completion for the Works, a final updated report detailing the Predicted Effects, Acceptable Effects and actual effects of the Works, the Temporary Works and the Contractor's Activities on the existing ground conditions and infrastructure.

3.3 Site Investigation

- (a) The Contractor must undertake all site investigations required for the performance of the Contractor's Activities.
- (b) Geotechnical site investigation work must be undertaken in accordance with AS1726 Geotechnical Site Investigations. The Contractor must maintain records of all tests, site investigation and geotechnical reports (including position and level of test and investigation locations)

- (c) Site investigation work associated with Contamination must be undertaken in accordance with Environment Protection Authority - Contaminated Sites: Sampling Design Guidelines.
- (d) Site investigations, in conjunction with the design process, must identify all ground conditions and infrastructure conditions (including the condition of roads, access driveways, bus stops and associated bus service infrastructure, parks and other publicly accessible areas, footpaths and cycleways, Utility Services, railways, buildings and other structures) which may be affected by the Works, the Temporary Works or the Contractor's Activities.
- (e) Where ground conditions or infrastructure are expected to be affected by the Works, the Temporary Works or the Contractor's Activities, the Contractor must diligently monitor the actual effects in accordance with the requirements of section 3.2 and section 3.4.
- (f) All site investigations must be included in the Design Documentation in the following electronic formats:
 - (i) .pdf; and
 - (ii) ASCII data file in Association of Geotechnical and Geoenvironmental Specialists (AGS) format.
- (g) In addition to the requirements in section 3.3(e) above, all insitu test results, including cone penetration, stress, packer permeability and pressuremeter test results, groundwater monitoring and laboratory test results related to site investigations must be provided in electronic format (either .xls or .xlsx). All Contamination laboratory test results must be provided in ESdat electronic lab data format.
- (h) The Contractor must provide the Principal's Representative with two copies of all site investigation reports, including progressive copies of such documents as each is developed, promptly, and in any event within 5 Business Days of the Contractor receiving such reports.

3.4 Condition Surveys

- (a) The Contractor must undertake pre-construction ground and infrastructure condition surveys to establish the condition of all existing ground and infrastructure which could be affected by the Contractor's Activities prior to commencing any activity which could affect existing ground conditions or infrastructure (including roads, access driveways, bus stops and associated bus service infrastructure, parks and other publicly accessible areas, footpaths and cycleways, Utility Services, railways, buildings and other structures).
- (b) The pre-construction ground and infrastructure condition surveys must be conducted with the agreement of the Utility Service owner, property owner and any occupier and be completed at least 30 days prior to the Contractor commencing the relevant activity. The Contractor must prepare a detailed record that, as a minimum, includes dated photographs of the pre-construction conditions of all ground and infrastructure which may be affected and a summary description of the pre-construction condition of the ground and infrastructure.
- (c) The Contractor must provide the Principal's Representative and the owner and/or occupier with a hard copy and an electronic copy in .pdf format of the survey report promptly, and in any event within 5 Business Days of the Contractor receiving such a report.

- (d) The Contractor must provide Utility Service owners, property owners or occupiers with a notice proposing at least two alternative dates for the completion of pre-construction ground and infrastructure surveys. If a Utility Service owner, property owner or occupier does not provide the Contractor with sufficient access to carry out a pre-construction ground and infrastructure survey within 21 days of the latest date which the Contractor included in the notice, the Contractor must give the Principal's Representative a copy of the notice and a signed statement by the Contractor to the effect that the Utility Service owner, property owner or occupier has not provided sufficient access to carry out the pre-construction ground and infrastructure survey.
- (e) The Contractor must undertake post-construction ground and infrastructure surveys to establish the condition of all ground and infrastructure (including the existing infrastructure subject to pre-construction ground and infrastructure condition surveys) which may have been affected by the Contractor's Activities.
- (f) The Contractor must provide the Principal's Representative and the owner and/or occupier with a hard copy and an electronic copy in .pdf format of the survey report promptly, and in any event within 5 Business Days of the Contractor receiving such a report. The post-construction ground and infrastructure surveys must be:
 - (i) carried out after the completion of all activities which may affect ground conditions and infrastructure; and
 - (ii) conducted with the agreement of the property owner and any occupier and must include a detailed record (including dated photographs) of the post-construction conditions of the ground and infrastructure.
- (g) The Contractor must provide Utility Service owners, property owners or occupiers with a notice proposing at least two alternative dates for the completion of post-construction ground and infrastructure surveys. If a property owner or occupier does not provide the Contractor with sufficient access to carry out a post-construction ground and infrastructure survey within 21 days of the latest date which the Contractor included in the notice, the Contractor must give the Principal's Representative a copy of the notice and a signed statement by the Contractor to the effect that the Utility Service owner, property owner or occupier has not provided sufficient access to carry out the post-construction ground and infrastructure survey.
- (h) As a condition precedent to Completion of the Works, the Contractor must issue to the Principal's Representative and the Utility Service owner, property owner and/or occupier a hard copy and an electronic copy in .pdf format of the pre-construction and post-construction survey report except where the property owner or occupier does not provide sufficient access to complete the pre-construction ground and infrastructure survey or the post-construction ground and infrastructure survey in which case the Contractor must issue to the Principal's Representative a hard copy and an electronic copy in .pdf format of the notice and statement referred to in subsections 3.4(d) and (g) above.
 - (i) The pre-construction and post-construction ground and infrastructure condition surveys detailed in this section 3.4 must be carried out by an independent and appropriately qualified and experienced assessor for the specific element of ground or infrastructure being surveyed.
 - (j) Infrastructure condition surveys detailed in this section 3.4 must be undertaken in accordance with the requirements in AS 4349.1 Inspection of Buildings - General Requirements.

3.5 Survey

- (a) The Contractor must provide and verify survey control for the Contractor's Activities.
- (b) The Contractor must promptly provide the Principal's Representative with two copies of all property and land surveys, including progressive copies of such documents as each is developed.
- (c) Survey undertaken by the Contractor must comply with the requirements in the SMRs.
- (d) The Contractor must avoid where possible disturbance of established survey marks and must re-establish any such marks disturbed or affected by the Contractor's Activities, in accordance with the requirements of relevant Authorities and the requirements in the SMRs.
- (e) All survey and design levels must refer to Australian Height Datum ("**AHD**"). All survey plan coordinates must refer to the MGA -94 Zone 56 coordinates, based on the Geocentric Datum of Australia ("**GDA**").
- (f) The Contractor must, as a minimum, establish permanent survey marks ("**PSMs**"), at the following locations within the Site:
 - (i) at the northern abutment of the SYAB.
- (g) The PSM's must be placed in accordance with the requirements of the Surveying Regulation 2006 (NSW).

4 Technical activities, scope and requirements

4.1 General

- (a) The Works must be designed and constructed to comply with:
 - (i) the criteria specified in this SWTC;
 - (ii) Codes and Standards; and
 - (iii) the requirements of all relevant Authorities.
- (b) The Design Documentation for the Works must not depart from the Tender Design included in Schedule C2 in a manner that will:
 - (i) increase user costs or whole of life costs; or
 - (ii) reduce the performance of any part of the Works including:
 - A. quality and amenity;
 - B. safety;
 - C. durability;
 - D. aesthetics, cleanliness, condition and visible features;
 - E. heritage requirements and values;
 - F. design life;
 - G. maintainability;
 - H. whole of life performance;
 - I. environmental performance;
 - J. sustainability performance;
 - K. user benefits;
 - L. functional performance; or
 - M. security.
- (c) When the Worksites used by the Contractor are located on property owned by an Authority, the Contractor must:
 - (i) complete the Contractor's Activities to minimise any disruption to the public, adjoining landowners or tenants; and
 - (ii) complete all of the Contractor's Activities and bring the Contractor's Activities on the Worksite to Completion as soon as possible after the Contractor takes possession of the Worksite.

4.2 Design Life

- (a) In this SWTC "Design Life" means the period over which an asset must continue to meet the technical requirements for its intended function without replacement or unscheduled maintenance

(b) Subject to section 4.2(c), the assets included in the Works must have, as a minimum, the Design Life specified in Table 4.1.

Table 4.1 Minimum design life

Asset or Element of the Works	Design Life (years)
All structural elements including bridges, retaining structures (less than 2m height or not retaining railway embankment/cuttings), culverts, deflection walls, substructure including piling, buildings and miscellaneous civil structures.	100
Retaining structures greater than 2m high measured from the underside of footing, and any retaining wall supporting railway embankment or cuttings	120
Drainage structures and inaccessible pipe systems,	100
Embankments and cuttings	100
Permanent ground anchors	100
Waterproofing systems	100
Non-structural building elements	50
Elastomeric bridge bearings	40
Pot Bearings (or similar metal bearings)	100
Foundation structures and any permanent primary support connections for all artwork, signage and wayfinding systems	50
Flood scour protection	50
Sign support structures and other roadside furniture	50
Road pavements - concrete	50
Road pavements – asphaltic concrete	20
External pedestrian paving (including substrate and paving finish)	30
High voltage switchboards, transformers and electrical systems	30
OHWS	100
OHW	30
Low voltage switchboards, lighting fixtures and electrical systems	30
Drainage pump systems and associated electrical equipment	30
Cabling, conduits and support systems	25
Communication systems, public information systems and security systems	20
External furniture and fittings	20
Fences, screens and security/fire gates or doors	20
Flexible (asphalt) road pavements, car park surfaces, external paving, footpaths and hard landscaping features	20
Artwork, signage and wayfinding - panel faces and fascia panels (internal and external)	20

Asset or Element of the Works	Design Life (years)
CCTV and control systems	15
Multi-User-Screens (MUS), IT equipment	5

- (c) Connections between items of different Design Life must be detailed to allow for replacement without adverse damage of the item with the higher Design Life, for example fence base plate to top of retaining wall.
- (d) For inaccessible structural steel, additional steel thickness must be provided to achieve the specified Design Life ignoring any contribution from any coating.
- (e) Protective coating is required for concrete structures, Materials, Finishes, Fixtures and Fittings.

4.3 Design Criteria

4.3.1 General

4.3.1.1 Overall

- (a) The SYAB, Approach Slabs, Regent Street Entrance Road and Yard Access Road must meet the following criteria:
 - (i) vehicle entry point along the frontage of 56 to 64 Regent Street;
 - (ii) entry point to facilitate safe pedestrian crossing along Regent Street;
 - (iii) the SYAB northern abutment must be located within Worksite D; and
 - (iv) Due to the low design speed, the requirement for edge clearances to face of safety barriers in AS 5100 Part 1 Table 9.5 does not apply for the SYAB;
- (b) The design must make provision for the following:
 - (i) design speeds:
 - A. Regent Street – 60km/h
 - B. Bridge Speed – 20km/h
 - C. Turning speed into driveway – 10km/h
 - (ii) the following design vehicle generally as defined in Austroads Design Vehicles and Turning Path Templates Guide:
 - A. single unit truck / bus (12.5 m);
 - B. prime mover and semi-trailer (19m); and
 - C. prime mover and low-loader semi-trailer (25m);
 - (iii) design vehicles for swept path analysis:
 - A. two lane bi-directional operation for single unit truck / bus (12.5 m) rigid truck for the SYAB and approaches only, not a requirement for Regent Street Entrance Road;
 - B. prime mover and semi-trailer (19m), one-directional use – traffic controls required for this irregular occurrence; and

- C. prime mover and low-loader semi-trailer (25m) l, one-directional use – traffic controls required for this irregular occurrence;
 - (iv) design vehicles for axle loads:
 - A. Austroads T44 truck; and
 - B. AS5100 A14 axle load;
 - (v) an automated runaway vehicle arrestor to mitigate the safety risk to pedestrians on the Regent Street footpath and vehicles on Regent Street. The vehicle arrestor is required to prevent a fully laden runaway single unit truck / bus (12.5 m) from entering Regent Street;
 - (vi) a single unit truck / bus (12.5m) to pull off Regent Street and be clear of the Regent Street footpath, prior to the automated security gates to the Sydney Yard being opened;
 - (vii) drivers to access security access points (including card readers and intercom) from the cab of single unit truck / bus (12.5m) and light vehicles without the need to exit their vehicle;
 - (viii) maximum gradient of 15.4%;
 - (ix) top of rail clearances to comply with ASA standards for electrified lines considering both design alignment and Track survey;
 - (x) clearance to the Mortuary Line of 5.0m, notwithstanding 4.3.1.1.(viii);
 - (xi) movements at Regent Street to be left in / left out only, with no signalisation;
 - (xii) The Regent Street Entrance Road must incorporate a turn-back bay suitable for a 12.5m rigid truck entering from Regent Street to make a 3 point turn and return back to Regent Street in a forward direction.
 - (xiii) conduits in the concrete vehicle barriers on each side of SYAB for electrical power, lighting, CCTV and communications cables as required including appropriate access and junction pits;
 - (xiv) 2 x 125mm spare conduits in the concrete vehicle barrier on each side of the SYAB; and
 - (xv) All tracks beneath the SYAB are within an electrified area, including the design and construction of the protection screen to meet the boundary fencing at the gate line and entrance to the SYAB
- (c) The SYAB design must be in accordance with AS 5100, Australian Bridge Design Code, using all loads defined therein except for the traffic design loading which must be taken to be a minimum of T44/ L44 loading as specified in the earlier Austroads bridge design code. This also includes consideration of a 14 tonne single axle load.
 - (d) Design must consider the “whole of lifecycle costs” in developing any design solution and propose any necessary alternate solutions that may provide a “value for money” solution for the Principal.
 - (e) The Contractor must consider the construction constraints in the design, particularly construction activities during live road and rail operating conditions as well as restrictions associated with construction during track possession.
 - (f) The Contractor must allow for adequate clearance between the SYAB and both the existing brick viaduct and the OHW structures to allow for stakeholders to operate

and maintain their asset. Clearance distances are to be agreed between the Contractor and stakeholders during detailed design and confirmed by the Principal.

- (g) The Contractor must determine and comply with clearance requirements to the Prince Alfred Services Tunnel through consultation with asset owner.

4.3.1.2 Heritage

- (a) The Contractor must ensure the SYAB construction, design and operation does not compromise the heritage values and heritage significance setout in section 4.3.1.2(b), the heritage values of Sydney Terminal and Central Railway Stations Group, the Chippendale Heritage Conservation Area (HCA), the Mortuary Station or the former Co-Masonic Temple as detailed in the Central Station Conservation Management Plan.

- (b) Heritage values and significance

- (i) The SYAB is located within two precincts of Central Station as defined by the Central CMP. Generally, both precincts are significant as a railway and industrial landscape that has historically supported, and continues to support, the functioning of Central Station. The precincts have historic, aesthetic, and research potential.

- (ii) In relation to the Western Yard heritage significance:

- A. the Central Station Conservation Management Plan (CMP), NSW Government Architect's Office & Rappoport Pty Ltd, June 2013 states that

- 'The Western Precinct has historical associations with the development of the Sydney rail network and the first, second and third Sydney terminuses. It has been continuously used as a railway yard since the 1850s although areas of the yard have recently been converted to other uses. This precinct contains the earliest underpass and overbridge of the NSW rail network. This precinct also contains the Mortuary Station, a distinctive Gothic revival station associated with the transfer of coffins and mourners to Rookwood Cemetery.'*

- B. the significance ratings of effected elements within the Western Yard Precinct are:

- 1. Western Yard Precinct Overall—High Significance.
 - 2. Mortuary Station—Exceptional Significance.

- (iii) In relation to the effected elements within the Sydney Yard Precinct, the CMP provides no heritage significance rating.

- (iv) In relation to the Mortuary Station Heritage Significance:

- A. Mortuary Station is listed on the NSW State Heritage Register. (SHR).The SHR listing for Mortuary Station does not have a formal Statement of Significance.

- B. The City of Sydney, Statement of Significance states that:

- 'The former Mortuary Station is historically and socially significant as a physical reminder of former funeral customs in nineteenth century Australia, and of the central role in funeral services played by the railway. It would have been a place with memorably sad associations for many Sydney people over a long period. The building is aesthetically significant as a fine example of Gothic*

inspired design attributed to James Barnet, a style adopted for its religious associations in the construction of a funeral station. It is a rare surviving example of this building type in Australia.'

- C. Although the primary elevation of Mortuary Station is to Regent Street, the building is unique in that it also addresses the Western Yard with its Gothic revival sandstone loggia designed to allow for funeral trains to pick up mourners travelling to Rookwood Cemetery.
- (c) The Contractor must complete all design activities to:
- (i) integrate design solutions to be light weight and minimise impacts to the views and character of the existing station and heritage precinct.
 - (ii) integrate design solutions to be of high quality, utilising a structure and materials that reference the industrial context; and
 - (iii) develop all design elements to compliment the character of the existing high value heritage buildings and structures within and surrounding the station precinct.
- (i) All design elements must have minimal visual or heritage impact to the Mortuary Station.

4.3.1.3 Architecture

- (a) The Contractor must design and construct the SYAB:
- (i) to minimise the apparent scale and visual impact of the bridge;
 - (ii) as a simple, elegant form, with gentle curvature in plan and elevation;
 - (iii) to a high architectural and urban design quality (at least equivalent to the quality of the benchmarked bridges listed in 4.3.1.3 (vi));
 - (iv) using engineers, registered architects and registered landscape architects to complete the Design Documentation who must:
 - A. have demonstrable performance and peer recognition through professional awards for urban, landscape and architectural design; and
 - B. have proven experience designing and documenting a minimum of three rail or road over bridges in urban environments over the last five years.
 - (v) considering design principles contained within "Bridge Aesthetics, Bridge Design Guidelines", Roads and Maritime Services, July 2012;
 - (vi) demonstrating best practice in integrated bridge engineering, architectural and urban design and construction comparable to the following benchmark projects and their component parts, materials, fittings and equipment:
 - A. Australia Avenue rail over-bridges Sydney Olympic Park- composition, abutments, retaining walls, parapets, piers, concrete quality, anti/climb barriers, lighting, and fencing; and
 - B. Albert Tibby Cotter Bridge, Moore Park Sydney – composition, geometric precision, abutments, parapets, piers, concrete quality, detailing and finishes, steelwork detailing and finishes, lighting, protection screens;

(b) The Contractor must:

- (i) use a box, through girder, with composite deck superstructure, as shown in Figure 1;

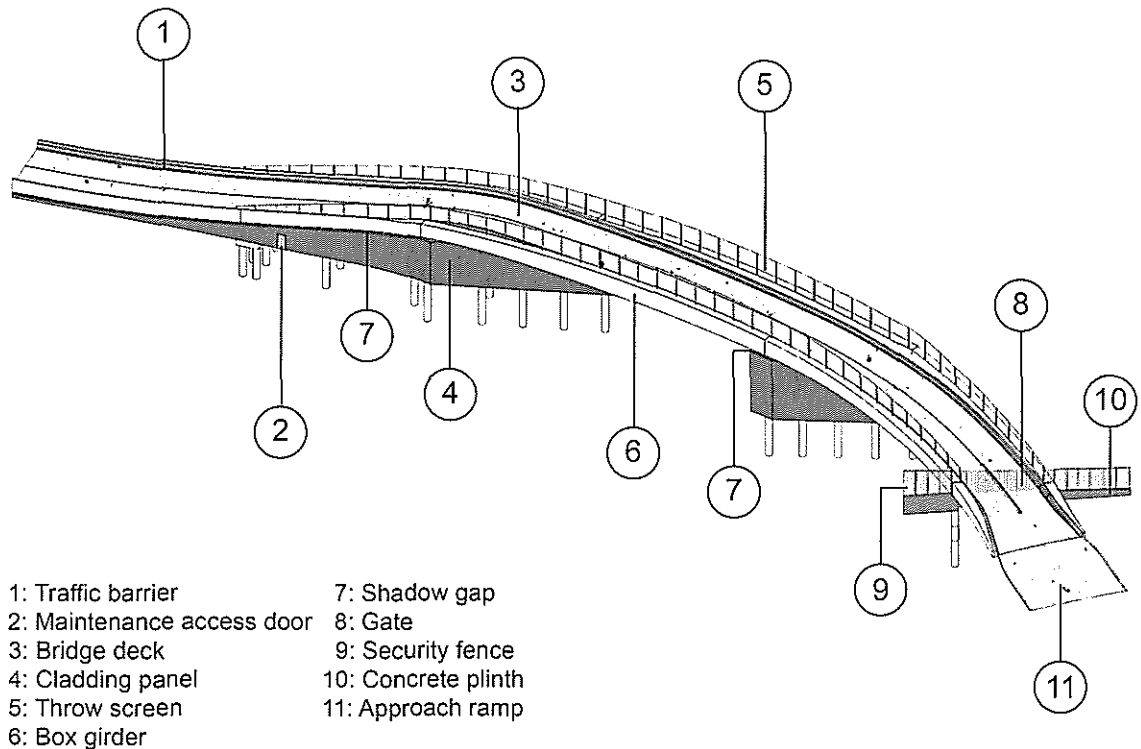


Figure 1 SYAB Axonometric View

- (ii) minimise the depth of the superstructure;
- (iii) minimise the number of visible bridge piers;
- (iv) minimise the height of the SYAB, measured to the top of superstructure;
- (v) minimise visual clutter beneath the SYAB;
- (vi) integrate the horizontal and vertical alignment of the SYAB, to form, as far as practicable, a continuous curvilinear alignment, minimising sharp transitions or deviations. The horizontal curvature may be a compound curve but must create an elegant form; and
- (vii) integrate the bridge Approach Slabs, walls, girders, parapets, barriers, protection screens, piers, and abutments to create a harmonious, singular composition.
- (c) Approach ramp walls must:
- (i) be vertical and parallel to the alignment of the bridge deck; and
- (ii) not extend beyond the outer face of the bridge superstructure.
- (d) Bridge abutments must:
- (i) be solid and not visually part of the bridge superstructure;
- (ii) be enclosed by vertical, pre-finished concrete, cladding panels; and
- (iii) not extend beyond the outer face of the bridge superstructure.

- (e) A prominent shadow line must be provided between the approach ramp walls and abutments, and the bridge parapet/box girders.
- (f) The bridge parapet and box girder must:
 - (i) be of continuous vertical curvature; and
 - (ii) drain towards the road surface.
- (g) Bridge piers that are visible must:
 - (i) be vertical, blade piers;
 - (ii) be visually integrated and geometrically coordinated with the superstructure;
 - (iii) not extend beyond the outer face of the bridge superstructure;
 - (iv) have no visible headstocks; and
 - (v) be profiled (in plan and/or elevation) to reduce the area of continuous reflected surfaces.
- (h) Bridge substructure must be enclosed by vertical, pre-finished concrete cladding panels.
- (i) Retaining walls, blade piers and abutment cladding panels have flat surfaces and sharp arrised joints that are vertical and equally spaced.
- (j) Traffic barriers, bridge parapet and box girders must:
 - (i) be visually integrated; and
 - (ii) transition gradually down to ground level at the western and eastern bridge approaches, over a distance of not less than 8 metres;
- (k) Gates, fences and protection screens must:
 - (i) be designed as an integrated suite of elements; and
 - (ii) join flush in alignment (plan and elevation).
- (l) Protection screens must:
 - (i) use non-reflective, lightweight mesh materials; and
 - (ii) have slender structural supports to minimise visual impact and the requirement for cross-bracing.
- (m) Safety screens must be used where it is necessary to ensure personal safety and clearance limits to live equipment and in accordance with ASA Standards.
- (n) In considering safety screens, the bridge structure can be accepted as a safety screen provided the structure is low and deep enough to comply with safety screen requirements and standards.
- (o) Utility Services and pipework must not be visible from the Sydney Yard, the Railway Track or public areas;
- (p) Junctions between materials must not allow water seepage into the substructure or onto visible surfaces;
- (q) The design must:
 - (i) provide ground level maintenance access by authorised personnel from Sydney Yard to the western edge of the suburban flyovers, adjacent to the SYAB; and

- (ii) as far as practicable, provide for safe access to each separate bridge component without the need to disrupt or stop train operations;
- (r) The SYAB must be free of advertising.

4.3.2 Structural Works

- (a) The design of the SYAB must comply with all of the requirements of TfNSW Document T HR CI 12030 ST “Overbridges and Footbridges” and AS5100.
- (b) The design of the SYAB must be for T44 / L44 design traffic loading and A14 vehicle axle loading – all other loadings must comply with AS5100.
- (c) The SYAB must be designed for fatigue considering 100,000 cycles for T44 truck loading.
- (d) The SYAB must be designed for earthquake effects in accordance with bridge classification ‘Type III’ i.e. essential to post-earthquake recovery.
- (e) The typology of the main span of the SYAB must be a box girder.
- (f) Design and construct all supporting structures in locations where collision protection is not required or otherwise provide supporting structures with the required collision protection in accordance with AS 5100. Piers adjacent to railway tracks must be of heavy construction designed to resist the loads specified in clause 10.4 of AS5100.2.
- (g) Retaining walls must be designed for a 20kPa live load surcharge.
- (h) Design and detailing for the SYAB must meet the following requirements:
 - (i) Traffic barriers must be at least medium performance level in accordance with AS 5100 and subject to a risk assessment to determine whether a special performance level is required.
 - (ii) Design detailing to facilitate inspections and minor maintenance to be undertaken without the need for possessions. Where possible, Steel box girders must include access / inspection hatches.
 - (iii) Where bearings and deck joints are provided, the design and construction must incorporate adequate access for inspection, maintenance and replacement of bearings and joints. Jacking points for bearing replacement must be provided on the bearing shelf and on the bridge superstructure. Expansion joints must include watertight seals.
 - (iv) Wing walls within 10m of the nearest track must be broadly parallel to rail track with an angle of not more than 15 degrees to the track.
 - (v) No pedestrian access is permitted over the overbridge;

4.3.3 Civil Works

- (a) A concrete road pavement must be provided on the SYAB, Approach Slabs, the Regent Street Access Road, the Yard Access Road (if included in the design) and the Sydney Yard Landing Slab.
- (b) The Sydney Yard Landing Slab must be at least 10m x 10m, must be clear of obstructions, and must meet the specification of a rail maintenance access road in TfNSW standard T HR CI 12200 ST “Access Roads”.
- (c) The Contractor must clear all obstructions from the swept path for all design vehicles (as specified in section 4.3.1.1(c)(ii)) which travel in a forward direction from the SYAB into the Sydney Yard and perform an uninterrupted U turn to return to the SYAB, including demolishing the existing toilet block but not the removal of

any viaduct supporting structure for the central flyovers to the east of the landing ramp, including OHW, signalling or lighting structures.

- (d) A pedestrian footpath is required on at least one side of the Regent Street Access Road to allow maintenance staff to access the control gate from Regent Street

4.3.4 Urban Design and Landscape

- (a) The Contractor must design the SYAB and the Regent Street Entrance Road to deliver an integrated urban design and landscape solution at Worksite A that:
 - (i) provides a high quality, resilient and low maintenance outcome;
 - (ii) is in accordance with crime prevention through environmental design (CPTED) principles in accordance with the EP&A Act, 1977;
 - (iii) incorporates planting to the perimeter of Worksite A to provide a soft scape visual barrier between the SYAB and adjacent buildings;
 - (iv) minimises, to the greatest extent possible, impacts to the footpath of Regent Street and ensures that all new footpaths or kerbs are of a material that matches existing; and
 - (v) ensures that all new top of kerb or ramp levels tie-in flush with adjacent pavements, and ramps are designed and constructed according to AS1428.
- (b) The landscaping must, where possible, incorporate plants that do not require ongoing watering beyond the initial bedding period which should be no longer than 12 months after Completion. An automatic drip-feed irrigation system, including automatic timer controls, moisture sensors, filters, valves, emitters and pipework to all new landscaped areas must be provided for plants that do require ongoing watering.
- (c) The urban design and landscaping features and treatments must be integrated with CCTV, lighting and other streetscape works to maintain sightlines and security for staff and other persons using the asset.
- (d) The landscaped areas must be protected and maintained in a healthy, clean and tidy condition including watering, weeding, replacement of dead, dying or unhealthy plants and the removal of litter and debris, for a period of 12 months after Completion.
- (e) All planting areas must be provided with minimum 300mm A-Horizon top soil, and 200mm of B-Horizon top soil in accordance with AS4419.
- (f) Finished subgrade surfaces to planting and turf areas must be cultivated to a minimum of 150mm depth immediately prior to spreading of topsoil.
- (g) All planting areas must be free-draining,
- (h) All planting areas must be provided with a minimum 100mm depth of organic mulch.
- (i) All groundcovers and grasses used must be planted at a density of at least four plants/m² and have a minimum 150mm diameter container size.
- (j) All shrubs used must be planted at a density of at least three plants/m² and have a minimum 150mm diameter container size.
- (k) All trees must have a minimum container size of 400 litres at the time of planting.
- (l) Seeding must not be used except for temporary stabilisation.
- (m) Mature trees must be incorporated in the landscape design to provide visual barrier between Regent Street and the rail corridor.

- (n) A minimum planted buffer zone of 2.5m must be provided between the Regent Street boundary of Worksite A and any hard paving not forming part of the roadway between Regent Street and the entrance gate, e.g. vehicle turn-back bay.
- (o) A high quality in-situ concrete finish or better must be provided to the Regent Street Entrance Road. A coloured concrete must be provided to disguise wheel marks. The surface must have a durable integrated oxide with an exposed aggregate finish or equivalent. The surface must be suitable for frequent washing during the construction period of Sydney Metro to remove mud and dust.
- (p) A high-quality finely crafted steel fence supported on a high-quality masonry / stone wall must be provided along the Regent Street boundary of Worksite A. The fence and wall must be designed to complement the Mortuary Station fence and other heritage walls and fences within the precinct. The fence must be powder coated with a high-quality paint system.

4.3.5 Materials, Finishes, Fixtures and Fittings

4.3.5.1 General

- (a) When the Contractor's Activities impact on property owned by an Authority, select and provide materials, finishes and fittings in accordance with the Authority's requirements regarding shape, size, texture, colour and the like and match or blend these in with existing materials and surfaces.
- (b) The Contractor must provide with each design submission schedules of materials, finishes and fittings, planting plans, plant species schedules, lighting concepts, specifications and details of all soft and hard landscape works for each public domain and/or landscaping area which is fully co-ordinated with signage elements.

4.3.5.2 Materials selection

- (a) The Contractor must:
 - (i) ensure the selection and use of materials that:
 - A. provides a high level of resistance to vandalism;
 - B. uses pre-finished surfaces where possible not requiring ongoing painting or similar types of maintenance;
 - C. minimises discoloration, leaching, mould growth and deterioration due to weathering and ultraviolet light; and
 - D. minimises maintenance of infrastructure and landscaping.
- (b) The schedules of materials, finishes and fittings provided under section 4.3.5.1(b) must include details of all proposed:
 - (i) materials and finishes to all surfaces
 - (ii) tolerances for horizontal and vertical joint
 - (iii) exposed concrete finishes, surfaces and tolerances.

4.3.5.3 Finishes

- (a) Finishes must comply with the following requirements:
 - (i) All visible concrete (excluding the road surface) must be AS3600 Class 2 concrete finish.
 - (ii) All visible concrete (excluding the road surface) to be coated with Nawkaw or equivalent concrete colour penetration finish.

- (iii) All exposed concrete and steel surfaces (excluding the road surface) must be coated with Ecotio2, photocatalyst coating, anti-graffiti protection or approved equivalent.

4.3.5.4 Samples

- (a) The Contractor must provide the final samples for external materials, finishes, and fixtures in the Preliminary Design submission and at other times agreed with the Principal; including but not limited to:
 - (i) structural steel and finishes;
 - (ii) concrete elements including pre-cast and cast in-situ concrete including cladding panels;
 - (iii) fences, gates and screens; and
 - (iv) lighting.
- (b) The purpose of the samples including supporting Design Documentation and specifications is to:
 - (i) confirm any design decisions usually made through physical inspections, such as colour selection, sizes and textures; and
 - (ii) establish design and construction workmanship quality benchmarks for the Contractor's Activities.
- (c) The installation and/or storage of the Contractor's samples must be in a location agreed to by the Principal and be at no cost to the Principal. The location may not be on the Site due to space availability and must be maintained until directed by the Principal.

4.4 Utility Services

4.4.1 General

The Contractor must:

- (a) identify, protect, provide structural support, relocate and/or adjust all existing Utility Services, which may be affected by the Works or the Temporary Works;
- (b) adjust all pit covers to suit new paving levels;
- (c) protect existing Utility Services and their protective coatings from any construction, operational and/or rail loading surcharge, vibration, corrosion and/or stray current;
- (d) coordinate with Utility Service owners inclusive of all license and easement agreements, permits and approvals when carrying out the Contractor's Activities;
- (e) remove all Utility Services and associated equipment, foundations, pits, slabs, cables and containment made redundant by the Works;
- (f) with the approval of the Utility Service owner, redundant underground hydraulic Utility Services located within the Site may be capped and left in place.
- (g) where redundant Utility Services extend beyond the Worksite boundary and do not form part of the Contractor's Activities, the redundant Utility Services and containment may, with the approval of the Utility Service owner, be left in place provided the ends of the Utility Service and containment are capped.

4.4.2 Existing Rail Utility Services

4.4.2.1 Sydney Trains Services Search Data

The Contractor must undertake all necessary investigations using non-destructive investigation to identify and mark the locations and depths of all Utility Services prior to any works being carried out in any area within or adjacent to the Utility Services or the Rail Corridor.

The Contractor is to be the primary controller of the Sydney Trains Services Search Data and must engage the services of a registered surveyor from the Sydney Trains Surveyor Panel who has undertaken Sydney Trains Detailed Site Survey Training to undertake all survey activities.

The Contractor's surveyor must:

- (a) utilise the MGA (Map Grid of Australia) survey coordination system;
- (b) progressively update the Sydney Trains Services Search Data in accordance with Sydney Trains requirements to show installed / amended / removed Utility Services;
- (c) issue Sydney Trains Services Search Data field drawings to secondary controllers as and when required; and
- (d) prepare a final "as built" DSS showing the final position and levels of all buried or hidden services in accordance with Sydney Trains DSS requirements.

4.4.2.2 Cabling including Combined Services Route (CSR) and Local Cable Routes (LCR)

- (a) The Contractor must:
 - (i) relocate or provide new CSR and LCR including cabling, trenches, containment systems, pits and under-track crossings as necessary to suit or as a result of the Contractor's Activities;
 - (ii) size the CSR and LCR to accommodate installation of all required Utility Services including those of Interface Contractors and co-ordinate all systems to rationalise containment; and
 - (iii) design and install the CSR and LCR routes to be sympathetic with all heritage fabric.
- (b) If the Contractor's Activities require the existing CSR and/or LCR to be altered, the Contractor must upgrade the extent that is altered by the Contractor's Activities, to meet current Codes and Standards.
- (c) All power and communications cables and equipment must be installed in a manner which does not interfere with the operation of any existing communications systems including existing signals, data, electrical or telecommunications services.
- (d) All new cabling must be continuous with no breaks or joints.
- (e) For existing cabling to be relocated, any joints and spacing between joints must be in accordance with Sydney Train's standards, guidelines and manuals.

4.5 Stormwater Drainage

- (a) Hydrological analysis must be based on Engineers Australia - Australian Rainfall and Runoff.

- (b) Drainage proposed in the rail corridor must comply with the requirements of T HR CI 12130 MA and T HR CI 12130 ST.
- (c) Drainage proposed in the public road must comply with the requirements of relevant Authorities.
- (d) Unless otherwise stated, drainage proposed on the SYAB and road area within the Site must comply with the requirements of Austroads Guide to Road Design; Part 5- Drainage.
- (e) Discharge into external drainage systems must have no net flow rate increase unless it can be demonstrated that increased flow rates would not increase downstream flood risk.
- (f) Allowable width of flow on the bridge deck is to comply with Austroads Guide to Road Design considering the bridge deck as a Secondary Road, as defined in the Austroads Guide to Road Design.
- (g) Surface runoff to adjoining road corridor must comply with Sydney Water Onsite Stormwater Detention Guide.
- (h) Surface runoff generated from a 100 year ARI storm event is not permitted to discharge via surface flow to the adjoining Rail Corridor.
- (i) The design must account for climate change requirements by increasing the design rainfall intensities by a minimum of 10% for events up to the 100 year ARI. Proposed attenuation must consider the 10% increase to the proposed flow rate scenario while not applying the increase to the existing flow rates.
- (j) The Contractor must:
 - (i) Modify and upgrade all parts of any existing drainage systems inside and outside the Site which are affected by the Contractor's Activities.
 - (ii) Provide a piped stormwater drainage system(s) to collect all rain falling on the SYAB and Worksite A.
 - (iii) Connect into existing drainage systems in a manner approved by the relevant Authority.
 - (iv) If drainage inlets are required for bridge deck drainage, integrate inlet grates with the bridge deck and conceal pipes from view.
 - (v) If necessary, provide a means of detaining stormwater flows within the Site to allow connection to existing drainage systems without the need for amplification of existing drainage systems and to ameliorate the impact of any additional stormwater flows on the existing drainage system.
 - (vi) Ensure that the drainage must not discharge onto the ballast or into slotted pipe systems without Sydney Train's written approval.
 - (vii) Ensure that all drainage structures are readily accessible for cleaning and maintenance purposes.
 - (viii) Adhere to the following requirements specific to drainage on the SYAB and Worksite A:
 - A. Drainage pits/sumps must:
 - 1. be spaced at intervals not exceeding 50m;

2. allow for a minimum of 50% blockage of pit/sump inlet capacity.
- B. Channel drains must be concrete lined.
- C. Channel drains must be constructed with a minimum longitudinal grade of 0.5%.
- D. The drainage pipes and pipe system must:
1. comply with the pipe installation type requirements in AS/NZS 3725 - Design for installation of buried concrete pipes, with installation types of no lesser requirement than HS3;
 2. use spigot and socket type pipes with rubber ring seals;
 3. be designed and constructed with a minimum gradient of 0.5%;
 4. have pipe classes and cover requirements suitable for construction traffic and staging conditions;
 5. be self-cleaning, where self-cleaning is defined as being achieved when the water velocity in pipes is ≥ 0.6 m/s for the 6 month ARI event; and
 6. use pipes with a minimum internal pipe diameter of 300 mm.
- E. Buried drainage pipes must:
1. be installed with a minimum cover of 600 mm,
 2. have a minimum pipe classification of Class 3 in accordance with AS/NZS 4058 Precast concrete pipes (pressure and non-pressure).
- F. Drainage grates and pit/sump covers must:
1. comply with the requirements of AS 3996 Access covers and grates;
 2. comply with the Class D load classification requirements in AS 3996 Access covers and grates; and
 3. be provided with a fastening device that prevents opening without the use of a specialised tool.

4.6 1500V Overhead Wiring (OHW) and Overhead Wiring Structures (OHWS)

The Contractor must:

- (a) make adjustments to Sydney Yard overhead wiring infrastructure which are necessary as a consequence of the construction of the SYAB;
- (b) Not Used.

- (c) design and construct the removal of Up Shunting Neck and Up Shunting Neck Crossover overhead wiring, wire run B-UR000A between anchors B0+413 and B0+678, and wire run B-UX000F between anchors B0+518 and B0+654, redundant switch connections and redundant steel work. The design must be developed in accordance with the Proposed 1500V Sectioning Diagram EL0536063 and the Sydney Yard OHW Modernisation Project provided in Appendix B;
- (d) demolish and remove all OHW and OHWS equipment, conductors, support registrations, drop verticals, cables, steelwork, structure footings, equipment and materials etc. made redundant by the Contractor's Activities;
- (e) complete a survey of existing OHWS and OHW system within the Site which may be affected by the Contractor's Activities prior to the Contractor's Activities and prior to handover;
- (f) maintain 1500V sectioning capability in accordance with Proposed 1500V Sectioning Diagram EL0536063; and
- (g) not attach any OHW support registrations directly to the SYAB.

4.7 Signalling

Refer to the Interface Schedule, Appendix 3 for the work scope responsibilities of the Contractor and the Interface Contractor.

The Contractor must:

- (a) design and execute the Contractor's Activities to comply with the Signalling Functional Specification in Appendix 4;
- (b) complete site survey of the Rail Corridor within the Site for the impacted wayside signal equipment, signalling cable routes and pneumatic air system lines. Where there is an impact relocate as required in accordance to ASA signalling standards;
- (c) where possible, undertake the Contractor's Activities to avoid or minimise any impact on the existing signalling infrastructure;
- (d) form a Signal Sighting Committee and undertake signal sighting for the impacted signals due to the Contractor's Activities, in accordance to ASA signalling standards;
- (e) where the Contractor's Activities do impact on the signal sighting, the Contractor must implement the recommendations of the Signal Sighting Committee;
- (f) assess the requirement for warning lights, and impacts on the existing safe places or the requirement to provide new safe places as a result of the Contractor's Activities;
- (g) remove signalling infrastructure made redundant by the Contractor's Activities.

4.8 Railway Track

(a) The Contractor must:

- (i) survey the Rail Corridor within the Site in accordance with ASA Standard T HR TR 13000 ST - Railway Surveying;
- (ii) produce a horizontal and vertical track alignment design at least 20 metres either side of the SYAB for Up Shunting Neck, Powerhouse Museum Siding and Regent St Platform Road;

- (iii) design and construct all of the Contractor's Activities based on Sydney Trains' current horizontal and vertical track alignment designs for all Permanent Way geometry impacted by the Works;
- (iv) install and document of Track Control Marks in accordance with ASA Standard T HR TR 13000 ST - Railway Surveying;
- (v) design and construct the Works so that there are no adjustments to existing Tracks, with the exception of the following:
 - A. Up to 36m of existing Up Shunting Neck track may be permanently removed to provide adequate clearance to the proposed bridge structure.
 - B. Regent St Platform Road and Powerhouse Museum Siding Track alignments may be modified.
- (b) If the Up Shunting Neck track is shortened, comply with the following conditions:
 - (i) assess the risk of a train colliding with the SYAB structure and if necessary install a new energy absorbing buffer stop;
 - (ii) if a new energy absorbing buffer stop is required:
 - A. the maximum extent of renewal of existing track on the Up Shunting Neck in addition to the 36m permanent removal must be the end infill panel of 250A/C crossover. Any further modification will require an operation impact review by NSW Trains;
 - B. remove the existing track from 250B catchpoint to the proposed end of track and replace with new plain track suitable for the proposed buffer stop and overrun;
 - C. ensure adequate clearance is provided from buffer stop structure to adjacent crossover track; and
 - D. the energy absorbing buffer stop and its supporting track must be capable of stopping an overrun train at design impact speed and preventing physical contact with any existing or proposed infrastructure.
 - (iii) construct and commission the new Track infrastructure prior to any works or temporary works that impact the section proposed for removal; and
 - (iv) remove Track made redundant by the Contractor's Activities

4.9 Low Voltage (LV) Distribution system

- (a) The LV distribution systems must be supplied from the Sydney Trains HV / LV distribution network, from Sydney Yard West Distribution Substation.
- (b) The LV distribution systems must have a back-up supply from the local Distribution Network Service Provider (Ausgrid).
- (c) All LV distribution equipment, with the exception of external party cable connection, must be located within the Rail Corridor.

4.10 Earthing, Bonding and Electrolysis Protection

The Contractor must

- (a) prepare an Earthing, Bonding, Isolation and Electrolysis Protection Plan (AC and DC, including temporary bonding for each construction stage) for all existing,

- modified or new infrastructure impacted by the Contractor's Activities and implement all mitigation measures identified in that plan;
- (b) The Earthing, Bonding, Isolation and Electrolysis Protection Plan must make provision for future attachment of OHW to the SYAB. This is to include design and construction of conduits to a suitable position to the North and South of the first span, to the underside of the SYAB behind the edge beam and into the piers and return to the rail such that cables can be installed at a future time;
 - (c) provide a worksite protection plan and an electrical isolation and bonding plan for each Track Possession, no later than 16 weeks prior to the Track Possession;
 - (d) assess the potential for stray current, transfer potentials and earth potential rise or the impact on the existing earthing and bonding system resulting from the Contractor's Activities including onsite impedance testing to establish a "baseline"; and
 - (e) following installation, undertake testing of isolation and bonding measures investigation / impedance testing and submit a final report to demonstrate the performance of the electrolysis mitigation measures of the new installation is in accordance with the relevant ASA and Authority Codes and Standards.

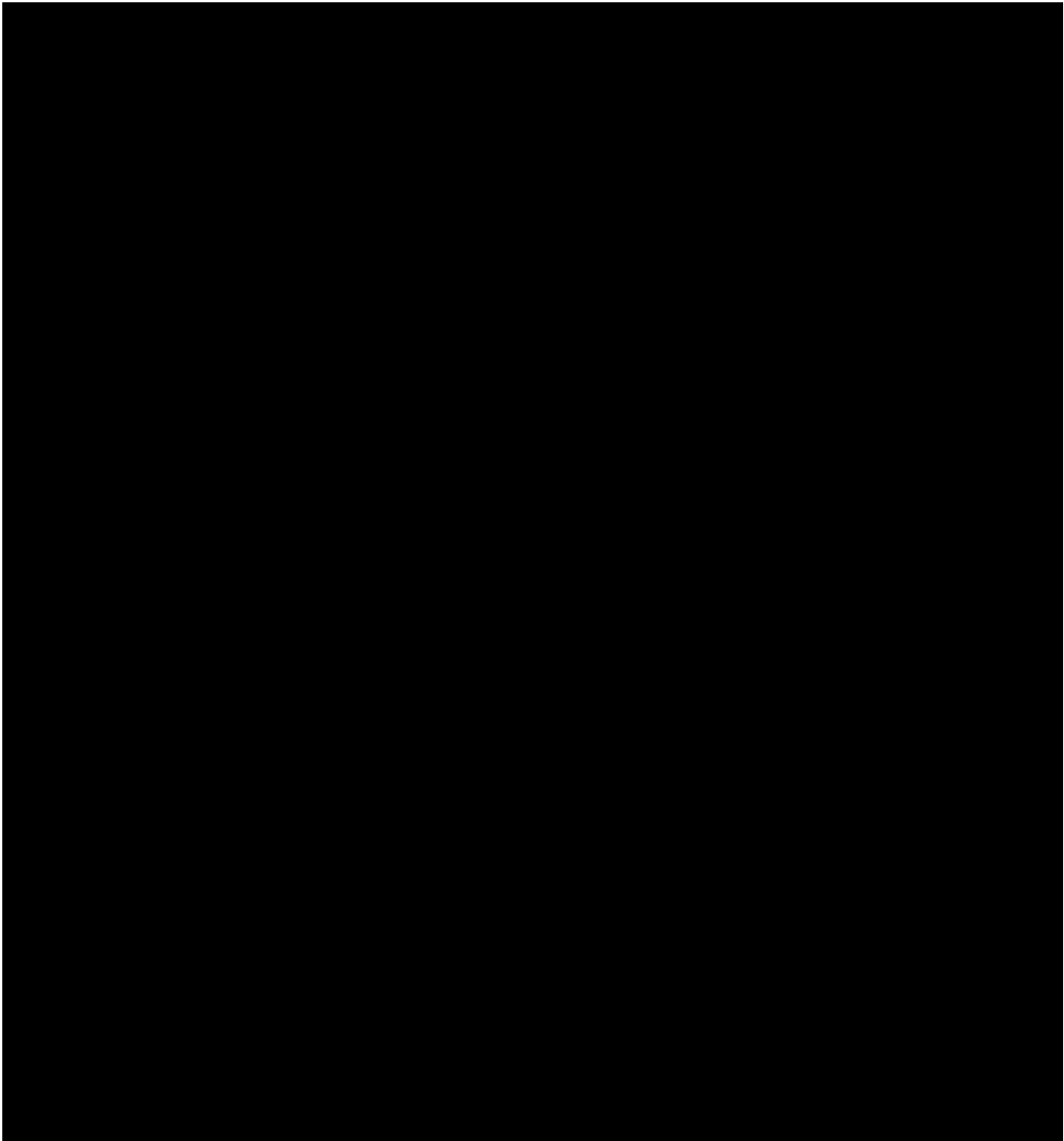
4.11 Lighting

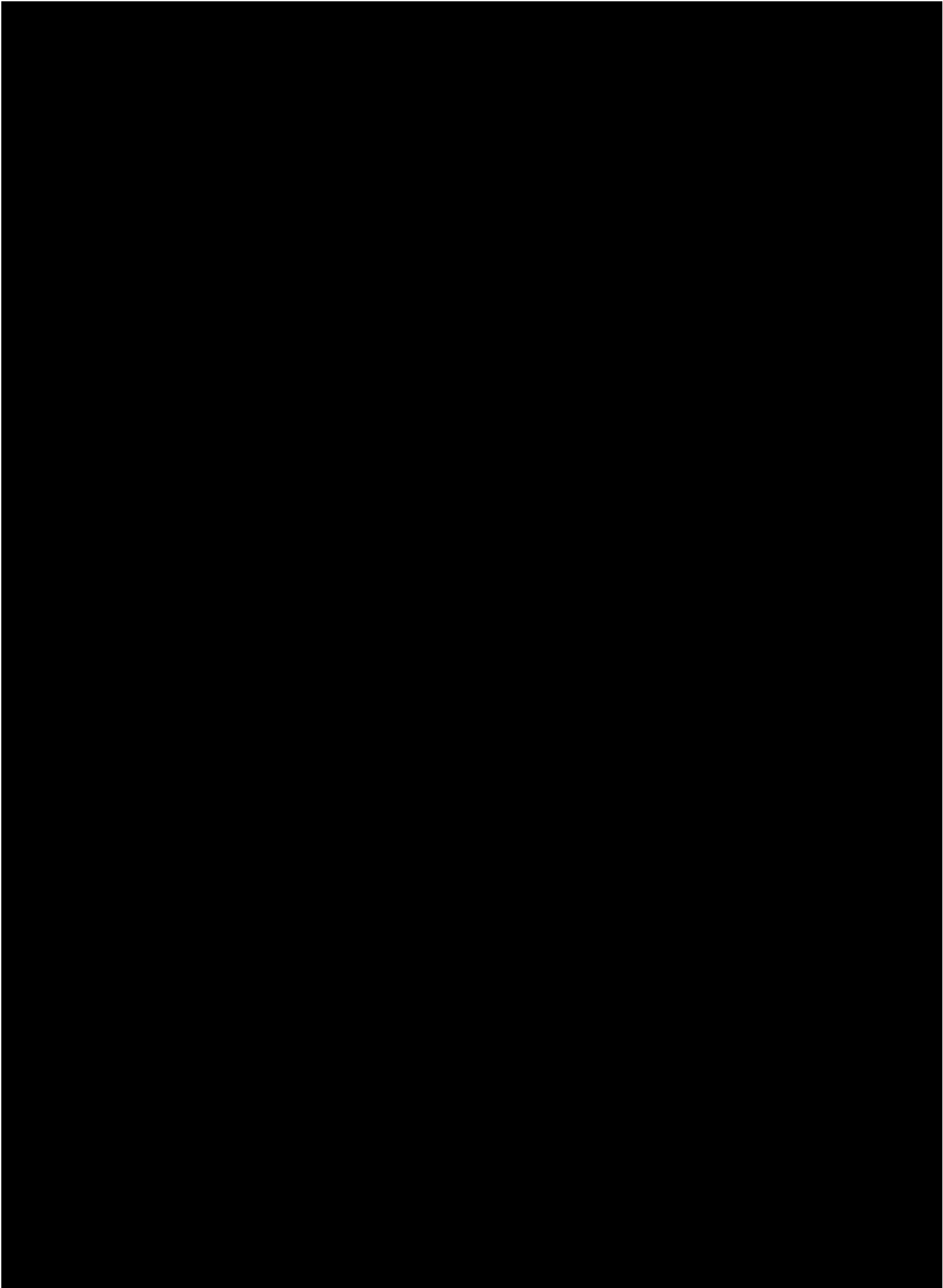
The Contractor must

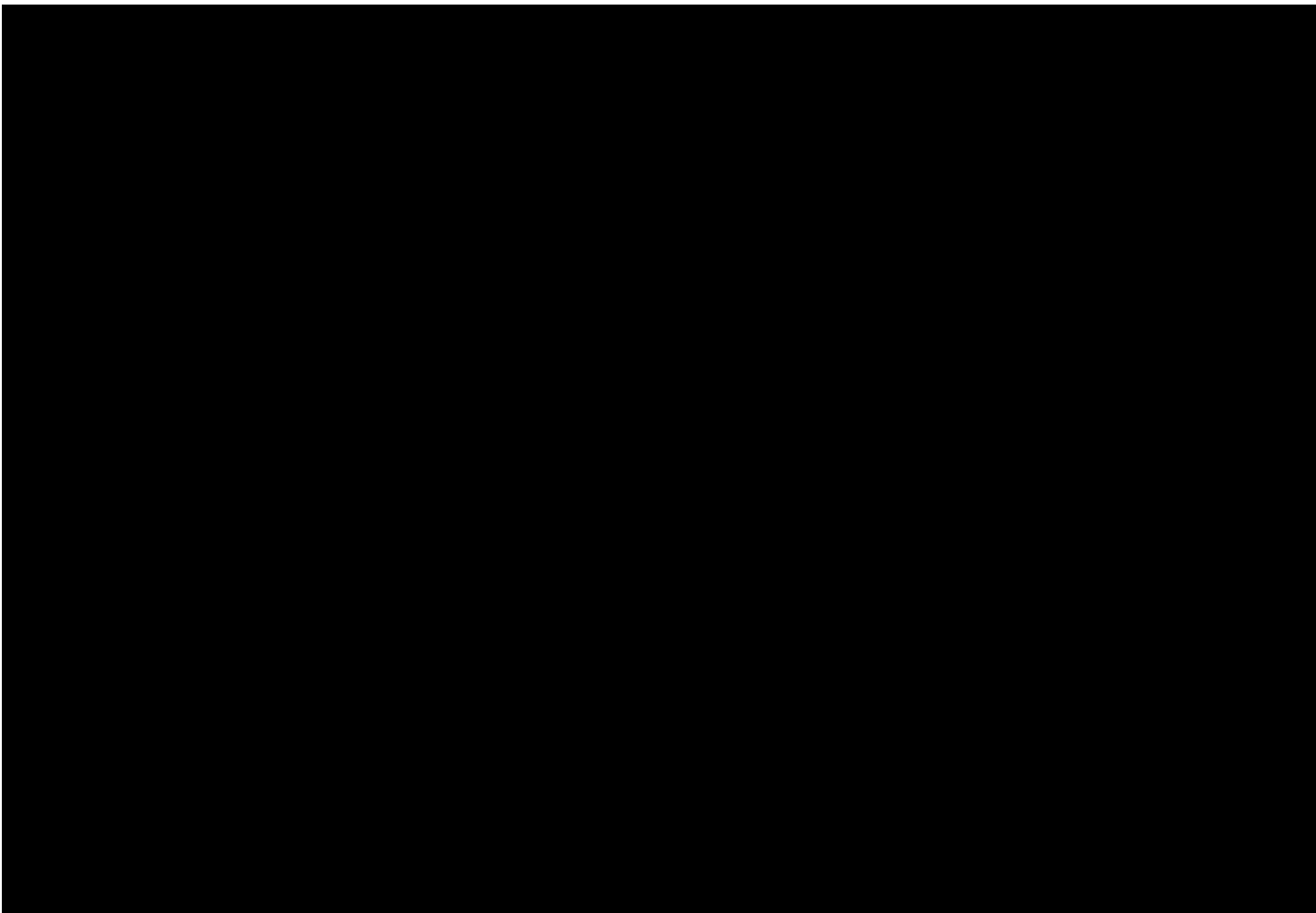
- (a) design and provide lighting to accommodate and be fully co-ordinated with final CCTV and signage layouts;
- (b) design and provide lighting to fully illuminate signs;
- (c) incorporate any additional lighting requirements identified in the security risk assessment as described in section 4.12.3;
- (d) design lighting which meets AS1158 and AS4282; and
- (e) meet Sydney Trains requirements regarding lighting for security cameras at the approach to the security gate in accordance with RailCorp Security Standard, including:
 - (i) Minimum Longitudinal Uniformity (UI) = 0.25;
 - (ii) Minimum Maintained Average Illuminance (Eav)= 50; and
 - (iii) Maintained Vertical Illuminance (Ev) = 15 at 1.5m;
- (f) meet Sydney Trains requirements, regarding lighting for the SYAB spans in accordance with the RailCorp Security Standard, including:
 - (i) Minimum Longitudinal Uniformity (UI) = 0.25;
 - (ii) Minimum Maintained Average Illuminance (Eav)= 35; and
 - (iii) Maintained Vertical Illuminance (Ev) = 10 at 1.5m;
- (g) design to provide minimal visual distraction for users and onlookers;
- (h) ensure no direct upward light spill by way of flat glass technology with no tilt to luminaires;
- (i) ensure that the lighting of the bridge is inconspicuous and does not cause nuisance in the public domain, spill towards the Mortuary Station or distract train drivers; and
- (j) if modification to the existing street lighting and associated equipment are located within public roadways, pathways or on land owned by an Authority other than

RailCorp/TfNSW or the lighting systems including street lighting maintained by Authorities other than Sydney Trains, the Contractor must comply with the requirements of the relevant Authority regarding the design, selection and installation of the lighting system cabling, equipment and installation and otherwise:

- (i) comply with the Public Area Lighting Code;
- (ii) comply with Authority and local Distribution Network Service Provider (Ausgrid) standards; and
- (iii) undertake “contestable works” requirements using an accredited service provider (ASP) Level 3 Designer and an ASP Level 1 & 2 for Installation & Metering Connection as appropriate who are certified and registered with the Department of Fair Trading.







4.13 Signage

The Contractor must:

- (a) design, manufacture, supply and install all general, safety and statutory signage to augment, upgrade or replace the general, safety, statutory and street signage throughout the Site and adjacent streets in accordance with all Codes and Standards, the Principal's and relevant Authority requirements;
- (b) remove and dispose of all signage made redundant by the Contractor's Activities;
- (c) undertake repairs and reinstatement of all surfaces and substrates from which existing signage is removed, to match the surrounding surfaces;
- (d) provide, in Design Documentation, general arrangement, layout, elevations and section drawings of proposed signage; and
- (e) design and install foundations and embedded support structures and fixings to support the signs.

4.14 Temporary maintenance level crossing

- (a) The Contractor must perform all works necessary to facilitate rapid construction by others at a later date of a temporary maintenance level crossing within the zone prescribed in drawing NWRLSRT-PBA-SCS-CE-DWG-238321 in Appendix 2 which will meet the requirements in section 4.14(b) or other location provided that the proposed alternative location is in compliance with all the requirements in clause 4.14(a)(i), 4.14(a)(ii), 4.14(b) and 4.14(c). The Contractor's Activities include:

- (i) protection or relocation of rail services and infrastructure;
- (ii) protection of retaining walls and service troughing; and
- (iii) levelling access across Power House Museum Siding road with removable material and providing:
 - A. temporary drainage to avoid ponding; and
 - B. access along the Power House Museum Siding for a prime mover and semi-trailer (19m);
- (b) The temporary maintenance level crossing referred to in section 4.14(a) will be capable of satisfying the following minimum requirements:
 - (i) vehicles up to a single unit truck / bus (12.5m) or 2 x front end loaders (FELs) carrying long track section (eg. switch rail section);
 - (ii) approach and exit width to accommodate swept path of vehicles;
 - (iii) Utility Service covers structurally designed to accommodate vehicle loads and allow access to Utility Services;
 - (iv) approach and exit surface levels to be below top of rail; and
 - (v) compliance with ESC 520 for a ballasted service level road crossing.
- (c) The Contractor must complete the work required under section 4.14(a) prior to any works or temporary works impeding access into Sydney Yard via the existing Mortuary Siding maintenance level crossing.
- (d) Where the Contractor requires a temporary track crossing for the purposes of the Contractor's Activities (for example rubber or asphalt in place of ballast), the Contractor must:
 - (i) construct the temporary track crossing in compliance with ESC 520 and the requirements of Sydney Trains regarding track inspections; and
 - (ii) complete and commission the temporary track crossing, with acceptance by the Principal, prior to any works or temporary works impeding access into Sydney Yard via the existing Mortuary Siding service level road crossing.

5 Construction Requirements

5.1 General

- (a) The Contractor must construct the Works and the Temporary Works in a manner and to standards which comply with and meet the requirements of the Contract, including this SWTC.
- (b) The Contractor must provide sufficient design resources during the construction phase to ensure effective monitoring of construction activities including, clarification of design issues, review of design changes, witnessing of acceptance tests and release of Hold Points testing and commissioning activities.

5.2 Work Methods and Training

The Contractor must:

- (a) develop and implement a procedure to manage excavations, earthworks and embankments that includes a risk assessment relating to the Contractor's Activities by depth, proximity to Utility Services, existing structures, the Rail Corridor and the Tracks;
- (b) plan and gain the approval of any Authority for all closures of road lanes, shoulders, footpaths or the introduction of a restriction in the flow of general traffic, pedestrians, cyclists or public transport services; and
- (c) immediately advise the Principal and relevant Authorities if an unplanned closure or restriction occurs including the nature of the closure or restriction and the planned schedule for reopening of the unplanned closure or restriction and take all required measures to reopen the unplanned closure or restriction as quickly as possible.

5.3 Special Events

- (a) A "special event" is a local or regional event which generates increased vehicle and/or pedestrian traffic or reduces traffic speed or lowers the capacity of the road network around the Site.
- (b) Where special events are expected to generate additional vehicle and/or pedestrian traffic in any areas directly or indirectly affected by the Works, the Temporary Works or the Contractor's Activities, the Contractor must cooperate with the Principal's Representative and relevant Authorities to facilitate the special event and any associated traffic and pedestrian flows around the Construction Site. The Contractor must modify the Contractor's Activities to accommodate the requirements of special events.

5.4 Demolition

Where demolition of infrastructure and buildings is required, the Contractor must:

- (a) undertake the demolition work in accordance with AS 2601 The Demolition of Structures, the conditions of the demolition license, Safe Work Australia and SafeWork NSW codes of practice and guidance and Sydney Metro Principal Contractor H&S Standard;
- (b) provide a levelled site free of depressions and undulations;

- (c) disconnect all Utility Services at the Site boundaries in accordance with the requirements of the relevant Utility Service owners;
- (d) cap all conduits and pipes at the disconnection points to prevent ingress of surface runoff and groundwater;
- (e) remove all structures, facilities and debris above ground level;
- (f) remove all ground slabs, basement structures, foundations, strip and pad footings, pile caps, tanks and other structures below ground level excluding piles below pile cap level and basement structures that can be utilised as ground support structures;
- (g) remove all demolished materials and debris from the Site;
- (h) backfill all excavations with fill free of deleterious materials and compact to a density consistent with the surrounding ground;
- (i) develop and implement a demolition method that minimises adverse noise, vibration and air quality impacts; and
- (j) recycle, to the maximum extent possible, all demolished materials to be removed from the Site.

5.5 Stockpiling of Materials

- (a) The Contractor must make its own arrangements for temporary and any permanent stockpiles of materials, including earthwork materials and excavated materials, arising from the Contractor's Activities which take place or are performed outside of the Site.
- (b) Any materials, including earthwork materials and excavated materials, which are surplus to or are not suitable for incorporation in the Works must be removed from the Site and properly disposed of in compliance with the requirements of the Contract.
- (c) Stockpiles must not be placed in drainage lines, channels or paths.

5.6 Redundant infrastructure

- (a) The Contractor must seek approval for the method of disposal of equipment made redundant by the Contractor's Activities from the Principal.

5.7 Construction Vehicle Loads

- (a) The Contractor must comply with the requirements in the Roads Act 1993 (NSW) when operating vehicles on public roads.
- (b) The Contractor will be permitted to operate vehicles with axle loads in excess of the limits nominated under the Roads Act 1993 (NSW) within the Site subject to the following conditions:
 - (i) the operation must be limited to within the Site and in association with the construction of the Works and the Temporary Works; and
 - (ii) the vehicles must not be permitted to travel along or across any existing pavement or over any structure unless the pavement or structure has been designed to carry the vehicle or has been otherwise protected from damage.

5.8 Temporary Site Facilities

- (a) All temporary site facilities, including site sheds, must be as-new and must be maintained in good condition. Site facilities, including site sheds, must be established at locations and positions that minimise the impact on adjoining properties and residents. All facilities utilised for the purpose of the Contractor's Activities must be sited, constructed and maintained in good condition to meet the requirements of relevant Authorities.
- (b) All temporary site facilities, including site sheds must be maintained free of graffiti and any advertising material not authorised by the Principal's Representative until the Date of Completion of the Works.

5.9 Site Facilities for the Principal

- (a) From the date that the Contractor establishes its site offices, the Contractor must provide the for the exclusive use of the Principal and its representatives an integrated, air conditioned open plan office of a standard that is suitable to accommodate five full-time persons, that complies with all relevant building codes and health and safety requirements ("**Principal's office**").
- (b) The Principal's office must:
 - (i) be located immediately adjacent to the Contractor's main site offices;
 - (ii) include five workstations of four square metres each, with an appropriate walkway space. Each workstation must include:
 - A. a desk;
 - B. a lockable pedestal drawer unit;
 - C. an office chair;
 - D. shelving units;
 - E. a minimum of four power sockets;
 - F. a separate telephone and computer data point; and
 - G. a minimum 4Mbps (Megabits per second) Internet connection for the TfNSW server connection.
- (c) All equipment, furniture, fittings and finishes provided for the Principal's office must be new and of a standard that is suitable for a professional office.
- (d) The Contractor must fully service and maintain the Principal's office including undertaking all security, cleaning and maintenance.
- (e) The Principal will supply all mobile information technology and communication equipment (such as computers, data cards and mobile phones) for use by the Principal's representatives.

5.10 Hoardings, Fencing, Walls and Signage

- (a) The Contractor must install and maintain temporary hoardings, fencing, walls and signage on and around the Site as necessary to provide safety and security in the performance of the Contractor's Activities. The temporary hoardings, fencing and walls must be erected prior to commencing the Contractor's Activities in the affected areas and must comply with SMR C.
- (b) Hoardings must be B Class standard for all locations where a pedestrian footpath abuts the hoarding.

- (c) Hoardings and fencing installed by the Contractor must be made from as-new materials and must at all times be maintained in a neat and tidy condition and be sympathetic with the surroundings.
- (d) Any hoardings, fencing or walls on or around the Site must be maintained free of graffiti and any advertising material not authorised by the Principal's Representative until the Date of Completion.
- (e) The Contractor must provide, install and maintain banners for the external faces of hoardings, fences and walls which are visible to the public. The banners must be made from shade cloth or other suitable materials and must include the artwork provided by the Principal in accordance with SMR C. Vinyl banners on solid hoardings must use "track and sail" install method.

5.11 Site Protection and Restoration

- (a) Without limiting the requirements of the Contract, the Contractor must comply with the requirements in the Planning Approval and ensure that significant trees (based on species, age or size) which may be affected by the Contractor's Activities are identified and appropriate protection management measures implemented including fencing and pruning.
- (b) The Contractor must reinstate the Site progressively as each part of the Works and Temporary Works is completed. All such reinstatement work must be completed as a condition precedent to Completion of each Milestone.
- (c) All land outside the Site (including the Temporary Areas and Extra Land) which has been in any way affected by Contractor's Activities must be reinstated to a condition at least equivalent to that existing before that occupation or use.

5.12 Discharge Water Quality

- (a) Without limiting the requirements of the Contract, all water including groundwater seepage, captured within the Site must be treated and disposed of in accordance with the Planning Approval and the requirements in relevant Authorities.
- (b) The Contractor must monitor the quality of water discharged from the Site.

5.13 Maintenance During Construction

- (a) The Contractor must:
 - (i) maintain the Site and any other areas affected by the Contractor's Activities in a clean and tidy manner throughout the duration of the Contractor's Activities; and
 - (ii) maintain and repair the Works and Temporary Works until the last Date of Completion.
- (b) The Contractor must ensure that all infrastructure, facilities and amenities in the areas being maintained are at all times fit for their intended purpose (as at the date of the Contract), clean and tidy and in a condition which satisfies the requirements of the Contract.
- (c) The extended storage of rubbish or loose items on the Site or elsewhere is not permitted and rubbish must be removed every second day or as required to keep the Site clean.

5.14 Acid Sulphate Soils and Rocks

Without limiting the requirements of the Contract, the Contractor must treat and dispose of any acid sulphate soils and rocks in accordance with:

- (a) Guidelines for the Management of Acid Sulphate Materials: Acid Sulphate Soils, Acid Sulphate Rock and Monosulfidic Black Ooze, RTA;
- (b) Department of Environment, Climate Change and Water requirements;
- (c) Acid Sulphate Soil Manual, NSW Acid Sulphate Soils Management Advisory Committee, (August 1998);
- (d) NSW Environmental Protection Authority - Assessing and Managing Acid Sulphate Soils; and
- (e) Environment Protection Authority, Victoria Information Publication 655 - Acid Sulphate Soil and Rock.

5.15 Contamination

Without limiting the requirements of the Contract, the Contractor must handle, treat and dispose of any Contamination encountered during the performance of the Contractor's Activities, in accordance with the Contaminated Land Management Act 1997, the Work Health and Safety Act the requirements in the Department of Urban Affairs and Planning & Environment Protection Authority - Managing Land Contamination: Planning Guidelines SEPP55 Remediation of Land, 1998, the Environmental Documents and the requirements of relevant Authorities.

5.16 Road Conditions

- (a) The Contractor must ensure that any road, footpath, shared path or cycleway which is open to the public is at all times kept free of any mud, dirt, deleterious material, trip hazards and debris arising from the Contractor's Activities.
- (b) The Contractor must, as a minimum, install, maintain and utilise wheel wash facilities and cover all construction vehicles to prevent any loss of fuels, lubricants, load or other substances, whether in the form of dust, liquids, solids or otherwise. Any spillage or build-up of such material or debris must be cleaned up immediately and any damage caused by such an occurrence must be immediately repaired.
- (c) The Contractor must apply appropriate treatments to roads, footpaths, shared paths or cycleways that protect the roads, footpaths, shared paths or cycleways from damage arising from the Contractor's Activities and allow for repair if damage occurs.
- (d) The Contractor must repair immediately any damage to any road, footpath, shared path or cycleway which is open to the public, caused by the Contractor's Activities. The road, footpath, shared path or cycleway must be repaired to a condition at least equivalent to the condition it was in immediately prior to the occurrence of the damage.

5.17 Traffic and Transport Management

- (a) Traffic and transport management associated with the Contractor's Activities must be planned to avoid delays and detours that will inconvenience the affected public or road users or interfere with traffic during periods of heavy traffic flows.

- (b) The Contractor must obtain approval from relevant Authorities prior to implementing any changes to traffic flow, vehicle, pedestrian, public transport and bicycle movements or adjustments to arrangements for control of traffic on roads and footpaths.
- (c) All traffic and transport management associated with the Contractor's Activities must comply with the Planning Approval and Sydney Metro City & Southwest Principal's General Specification G10 Traffic and Transport Management (SM ES-ST-214).
- (d) Where traffic control devices include safety barriers, the safety barriers must:
 - (i) comply with the RTA Traffic Control at Worksite Manual; and
 - (ii) be offset a minimum of 0.5m from the edge of the nearest adjacent traffic lane.

5.18 Property Access and Utility Services

- (a) The Contractor must carry out the adjustments to private properties and do all things necessary to satisfy the reasonable requirements of individual owners, occupiers of and visitors to properties, businesses and community facilities affected by the Contractor's Activities in respect of timing, duration and the carrying out of the relevant Contractor's Activities.
- (b) The Contractor must ensure that suitable access is maintained at all times to all properties and between severed portions of properties. Appropriate detours must be arranged and provided.
- (c) The Contractor must ensure that suitable access is maintained at all times to the two monitoring wells located within the scaffold zone in the adjoining property at 66 – 70 Regent Street, Chippendale. The monitoring well locations are shown marked as BH1/MW1 and BH2/MW2 on the Borehole / Well Location Plan for that property which is contained in Appendix 2.
- (d) No reduction to the level of access, (vehicular or pedestrian) to any commercial property during its relevant trading hours is permitted without the written agreement of the owner and occupier.
- (e) The Contractor must make all required arrangements with the affected public in relation to the impacts and consequences of the interruption of any Utility Services.

5.19 Unfixed materials in Sydney Yard

- (a) The Contractor must relocate all unfixed materials within Worksites D, E and F, as at the date of the Contract, to the area within Sydney Yard north of Worksite E that is bounded by Worksite F and the Suburban rail lines. The relocated unfixed materials must be placed and stacked neatly such that Sydney Trains or others have access to them on a 'like for like' basis when compared with the access to those materials at the date of the Contract.

5.20 Noise and Vibration

- (a) The Contractor must install and maintain acoustic walls and other noise attenuation devices in accordance with the requirements in the Planning Approval to provide noise mitigation during the performance of the Contractor's Activities. Contractor's Activities that require the installation of acoustic walls or other noise attenuation devices must not commence until the acoustic walls or other noise attenuation devices are erected.

- (b) Acoustic walls and other noise attenuation devices installed by the Contractor must be made from as-new or recycled materials and must at all times be maintained in a neat and tidy condition and be sympathetic with the surroundings.



Sydney Metro City & Southwest

Sydney Yard Access Bridge Project Contract Schedules

Schedule C1

Scope of Works and Technical Criteria
Appendix 1
Defined terms and acronyms

PROJECT	Sydney Metro City & Southwest	DATE	18 January 2017
GROUP	Sydney Metro City & Southwest	STATUS	Execution Version
AUTHOR	Transport for NSW	REVISION	
COMPANY	Transport for NSW	FILE NUMBER	A5446192
FILE NAME	SYAB Schedule C1 SWTC Appendix 1		

Contents

1	Defined and acronyms	1
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1 Defined and acronyms

- (a) Defined terms and acronyms which have been defined in clause 1.1 of the General Conditions have the same meaning where used in this SWTC.
- (b) For the purposes of this SWTC the following defined terms and acronyms have the related meanings set out opposite them in the table below unless the context requires otherwise.

Acceptable Effects	has the meaning given in section 3.2(e) of the SWTC
AGS	Association of Geotechnical and Geoenvironmental Specialists
AHD	Australian Height Datum
Approach Slabs	has the meaning given in section 2.2(b)(ii) of the SWTC
CCTV	means closed circuit television
Design Life	has the meaning given in section 4.2(a) of the SWTC
ESdat	means the proprietary environmental data management software distributed in Australia by EarthScience Information Systems (www.ESclS.com.au)
GDA	Geocentric Datum of Australia
LV	means low voltage
OHW	means overhead wiring
OWHS	means overhead wiring structures
.pdf format	means electronic personal data format
PSM	means permanent survey marks
Predicted Effects	has the meaning given in section 3.2(c) of the SWTC
Principal's office	has the meaning given in section 5.8(a) of the SWTC
Regent Street Entrance Road	has the meaning given in section 2.2(b)(iii) of the SWTC
Sydney Trains Detailed Site Survey Training	means the specific site survey training provided by Sydney Trains
Sydney Trains Service Search Data	means the service search data maintained by Sydney Trains
Sydney Trains Surveyor Panel	means the panel of approved / accredited surveyors maintained by Sydney Trains

Yard Access Road	has the meaning given in section 2.2(b)(iv) of the SWTC
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Appendix 2 SWTC drawings



Sydney Metro City & Southwest

Sydney Yard Access Bridge Project Contract Schedules

Schedule C1

Scope of Works and Technical Criteria
Appendix 2
SWTC Drawings

PROJECT	Sydney Metro City & Southwest	DATE	18 January 2017
GROUP	Sydney Metro City & Southwest	STATUS	Execution Version
AUTHOR	Transport for NSW	REVISION	
COMPANY	Transport for NSW	FILE NUMBER	A5412139
FILE NAME	SYAB Schedule C1 SWTC Appendix 2		

Contents

1	SWTC Drawings	1
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1 SWTC Drawings

- (a) The drawings listed in Table 1 below are included at Attachment 1 to this Appendix 2.

Table 1 – SWTC Drawings

Drawing Number	Drawing Revision	Drawing Title
NWRLSRT-PBA-SCS-EN-DWG-238911	A	Sydney Yard Access Bridge Legend and General Notes
NWRLSRT-PBA-SCS-EN-DWG-238913	A	Sydney Yard Access Bridge Materials and Furniture Schedule page 1 of 2
NWRLSRT-PBA-SCS-EN-DWG-238914	A	Sydney Yard Access Bridge Materials and Furniture Schedule page 2 of 2
NWRLSRT-PBA-SCS-CE-DWG-238321	A	Sydney Yard Access Bridge General Arrangement Plan
60429444-SHT-EL-0405470	3	Proposed Overhead wiring modernisation layout
60429444-SHT-EL-0405471	3	Proposed Overhead wiring modernisation layout
60429444-SHT-EL-0405472	3	Proposed Overhead wiring modernisation layout
60429444-SHT-EL-0405473	3	Proposed Overhead wiring modernisation layout
60429444-SHT-EL-0405474	3	Proposed Overhead wiring modernisation layout
60429444-SHT-EL-0405475	3	Proposed Overhead wiring modernisation layout
60429444-SHT-EL-0405476	3	Proposed Overhead wiring modernisation layout
60429444-SHT-EL-0405477	3	Proposed Overhead wiring modernisation layout
EL0536063	A	Overhead wiring modernisation project proposed 1500V Section Diagram
EL0405465	1	Proposed overhead wiring modernisation, Proposed Sectioning Diagram
EL0521620	A	Railway Overhead Wiring Removal of OHW Over Mortuary Siding Layout

-	-	Borehole/Well Location Plan 66-70 Regent Street, Chippendale, NSW 2008
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Attachment 1


LEGEND


SYMBOL DESCRIPTION

GENERAL

 SITE BOUNDARY

TREES

 EXISTING TREE TO BE REMOVED

 PROPOSED TREE


PLANTING


 MASSES PLANTING - REFER TO MATERIALS SCHEDULE

 CLIMBING PLANTS - REFER TO MATERIALS SCHEDULE


 SCREENING PLANTS - REFER TO MATERIALS SCHEDULE

PAVING


 IN-SITU CONCRETE - REFER TO MATERIALS SCHEDULE


 EXISTING KERB DEMOLISHED

KERBS


 GRANITE KERB - AUSTRAL VERDE - REFER TO MATERIALS SCHEDULE

LIGHTING


 LIGHT FIXTURE EXISTING - INDICATIVE LOCATION ONLY


 LIGHT FIXTURE TYPE 1 - POST TOP LIGHT - REFER TO MATERIALS SCHEDULE

WALLS


 IN-SITU CONCRETE CLASS 2 - REFER TO MATERIALS SCHEDULE

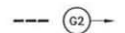
FENCES

 PALISADE FENCE ON CONCRETE PLINTH - REFER TO MATERIALS SCHEDULE

 SECURITY FENCE - REFER TO MATERIALS SCHEDULE

GATES

 MANUAL VEHICULAR DUAL-LEAF SLIDING GATE - REFER TO MATERIALS SCHEDULE

 AUTOMATIC VEHICULAR SINGLE-LEAF SLIDING GATE - REFER TO MATERIALS SCHEDULE

GENERAL NOTES

1.0 BOUNDARIES
THE POSITION OF THE BOUNDARIES SHOULD BE TAKEN FROM THE PROJECT SURVEY ACCURATE CADASTRAL MODEL. NO FIELD INVESTIGATIONS HAVE BEEN CARRIED OUT TO CONFIRM THE LOCATION OR DIMENSIONS OF THE MODELING INVESTIGATION.

2.0 KERBS
ANY NEW PAVEMENT OR LANDSCAPING WORKS ASSOCIATED WITH INSTATING NEW KERBS ARE TO MATCH THE EXISTING MATERIAL AND FINISH.

3.0 SERVICES
ALL SURFACE INDICATORS (MANHOLES, PITS, ETC) HAVE BEEN LOCATED EITHER BY FIELD SURVEY OR PHOTOGRAMMETRIC MAPPING. THE POSITION OF UNDERGROUND SURFACE INFRASTRUCTURE SHOWN WITHIN THE DRAWING FILE DELIVERABLES HAS BEEN UNDERTAKEN FROM INTERPRETATION OF DBYD DRAWINGS (REQUEST MADE - 21/04/2015). THE EXISTENCE AND EXACT EXTENT HAS NOT BEEN CONFIRMED BY FIELD INVESTIGATION.

4.0 SOILS
ALL TOPSOIL MUST BE IN ACCORDANCE WITH AS4419, AND INSTALLED TO THE FOLLOWING SPECIFICATIONS AND DEPTHS:

- 300MM TOPSOIL 'A' HORIZON - BENEDICT SMARTMIX # 6 NATIVE GARDEN SOIL MIX OR ACCEPTABLE EQUIVALENT.
- 200MM TOPSOIL 'B' HORIZON - 80% BENEDICT SMARTMIX # 6 NATIVE GARDEN SOIL MIX AND 20% COARSE WASHED RIVER SAND.

SUPPLIER: BENEDICT INDUSTRIES PTY LTD. OR ACCEPTABLE EQUIVALENT.

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REV.	BY	DATE	DESCRIPTION	APPR.
A	JS	30.08.16	ISSUED FOR CONTRACT DRAWING	BAV

Co-ordinate System: MGA Zone 56
Height Datum: A.H.D.

Plot Date: 30/08/16 - 18:06






NOTE: Do not scale from this drawing.



PARSONS BRINCKERHOFF AECOM COX HASSELL	DRAWN: VIVIANE NI DESIGNED: ANTHONY CHARLEWORTH DWG CHECK: ANTHONY CHARLEWORTH DESIGN CHECK: ANDREW BROWN APPROVED: IAN WILTON
---	--

SYDNEY METRO CITY & SOUTHWEST CENTRAL STATION URBAN / C/MC DESIGN SYDNEY YARD ACCESS BRIDGE LEGEND AND GENERAL NOTES	
STATUS: CONTRACT NWR/16 Dwg No. NWR\SRTPBA-SCS-EN-DWG-238911	SHEET 1 OF 1 DATE REV: A

MATERIALS SCHEDULE







CODE	SHORT DESCRIPTION	SAMPLE	LOCATION	PROPRIETARY NAME/ PROFILE/ DESCRIPTION	SIZE	MATERIAL	COLOUR / FINISH / DETAIL
PL1	MASS PLANTING		REFER PLAN	MASS PLANTING OF NATIVE SHRUBS AND GRASSES	140MM CONTAINER	N/A	SPECIES MIX: - LOMANDRA HYSTRIX - WESTRINGIA 'WYNYABIE GEM' - CALLISTEMON CITRINUS 'WHITE ANZAC' - MELALEUCA THYMIFOLIA 'WHITE LACE' ARRANGEMENT: RANDOM GROUPINGS OF 3-12 PLANTS PLANTING DENSITY: 3 / SQM
PL4	CLIMBING PLANTS		REFER PLAN	SELF CLINGING CLIMBING PLANTS	140MM CONTAINER	N/A	SPECIES: FICUS PUMILA ARRANGEMENT: LINEAR PLANTING PLANTING DENSITY: 400MM CTS
PL5	SCREENING PLANTS		REFER PLAN	DENSE EVERGREEN SCREEN PLANTING	45 LITRE CONTAINER	N/A	SPECIES: VIBURNUM ODORATISSIMUM 'AWABUKI' ARRANGEMENT: LINEAR PLANTING PLANTING DENSITY: 1000MM CTS
C1	IN-SITU CONCRETE		DRIVEWAY	IN-SITU CONCRETE PAVEMENT - VEHICLE CROSSING (DETAIL REFER TO CITY OF SYDNEY STREET TECHNICAL SPECIFICATIONS DWGS 2.5.7)	N/A	CONCRETE	REFER CoS DETAIL
K5	GRANITE KERB - RE-USE EXISTING		STREET KERB	RE-USE OF EXISTING STONE KERB (DETAIL REFER TO CITY OF SYDNEY STREET TECHNICAL SPECIFICATIONS DWG 1.1.1)	N/A	GRANITE	AUSTRAL VERDE

NOTE: FOR GENERAL NOTES AND LEGEND REFER TO DRAWING
NWRLSRT-PBA-SCS-EN-DWG-238911

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NSW GOVERNMENT Transport for NSW		SERVICE PROVIDER PARSONS BRINCKERHOFF AECOM COX HASSELL		CLIENT SYDNEY METRO CITY & SOUTHWEST CENTRAL STATION URBAN / CIVIC DESIGN SYDNEY YARD ACCESS BRIDGE MATERIALS AND FURNITURE SCHEDULE	
SCALE:		Plot Date: 30/08/16 - 16:06		STATUS: CONTRACT	
REV. BY DATE DESCRIPTION APPD.		DESIGNED: VIBRINE M ANTHONY CHARLESWORTH DRG CHECK: ANTHONY CHARLESWORTH DESIGN CHECK: ANDREW BROPHY APPROVED: JAN WHITTON		SHEET 1 OF 2	
A1 Original Co-ordinate System: MGA Zone 56 Height Datum: A.H.D. This sheet may be prepared using colour and may be incomplete if copied.		NOTE: Do not scale from this drawing.		MWRLSRT-PBA-SCS-EN-DWG-238911 MWRLSRT-PBA-SCS-EN-DWG-238911 REV. A	

MATERIALS SCHEDULE

CODE	SHORT DESCRIPTION	SAMPLE	LOCATION	PROPRIETARY NAME/ PROFILE/ DESCRIPTION	SIZE	MATERIAL	COLOUR / FINISH / DETAIL
FE1	PALISADE FENCE		REFER PLAN	GALVANISED STEEL POST AND VERTICAL RAIL PALISADE FENCE IN ACCORDANCE WITH RAILCORP ENGINEERING SPECIFICATION SPC511 CLAUSE 9.2. FENCE ON 300MM HIGH CONCRETE PLINTH. CONCRETE-CLASS 2 OFF FORM, IN ACCORDANCE WITH AS 1379, AS 3600 AND AS 3610	HEIGHT: 2000MM (TO MATCH MORTUARY STATION FENCE - DIFFERS FROM SPC STANDARD)	GALV STEEL	COLOUR: MATT BLACK FINISH: THERMOSET POLYESTER POWDER COATED FINISH CONCRETE COLOUR RANGE 1-4. ANTI-GRAFFITI TREATMENT. APPROVED SUPPLIER: NANOKOTE 'MARKHAM' OR 'PROGUARD'.
FE2	SECURITY FENCE		REFER PLAN	GALVANISED STEEL POST AND VERTICAL RAIL PALISADE FENCE IN ACCORDANCE WITH RAILCORP ENGINEERING SPECIFICATION SPC511 CLAUSE 9.2.	HEIGHT TO MATCH ADJACENT BRIDGE THROW-SCREENS (MINIMUM 3000MM ABOVE GROUND)	GALV STEEL	COLOUR: MATT BLACK FINISH: THERMOSET POLYESTER POWDER COATED FINISH
W1	IN-SITU CONCRETE WALL CLASS 2 OFF FORM		REFER PLAN	CONCRETE- CLASS 2 OFF FORM, IN ACCORDANCE WITH AS 1379, AS 3600 AND AS 3610	N/A	CONCRETE	CONCRETE COLOUR RANGE 1-4. ANTI-GRAFFITI TREATMENT. APPROVED SUPPLIER: NANOKOTE 'MARKHAM' OR 'PROGUARD'.
LF1	LIGHT FIXTURE TYPE 1 - POST TOP LIGHT		REFER PLAN	POST TOP LIGHT. LED FIXTURE. WITH TAPERED POLE. MANUFACTURER: KIM 'ARCHETYPE LED' OR ACCEPTABLE EQUIVALENT.	N/A	STAINLESS STEEL FIXTURE. ALUMINUM POLE	COLOUR: MATT BLACK FINISH: THERMOSET POLYESTER POWDER COATED FINISH
G1	MANUAL VEHICULAR DUAL-LEAF SLIDING GATE		REFER PLAN	GALVANISED STEEL POST AND VERTICAL RAIL PALISADE GATE IN ACCORDANCE WITH RAILCORP ENGINEERING SPECIFICATION SPC511 CLAUSE 12.4.	HEIGHT: 2000MM	GALV. STEEL	COLOUR: MATT BLACK FINISH: THERMOSET POLYESTER POWDER COATED FINISH
G2	AUTOMATIC VEHICULAR SINGLE-LEAF SLIDING GATE		REFER PLAN	GALVANISED STEEL POST AND VERTICAL RAIL PALISADE GATE IN ACCORDANCE WITH RAILCORP ENGINEERING SPECIFICATION SPC511 CLAUSE 12.4.	HEIGHT: 3000MM	GALV. STEEL	COLOUR: MATT BLACK FINISH: THERMOSET POLYESTER POWDER COATED FINISH

NOTE: FOR GENERAL NOTES AND LEGEND REFER TO DRAWING
NWRLSRT-PBA-SCS-EN-DWG-238911

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SCALE

CLIENT
NSW GOVERNMENT Transport for NSW



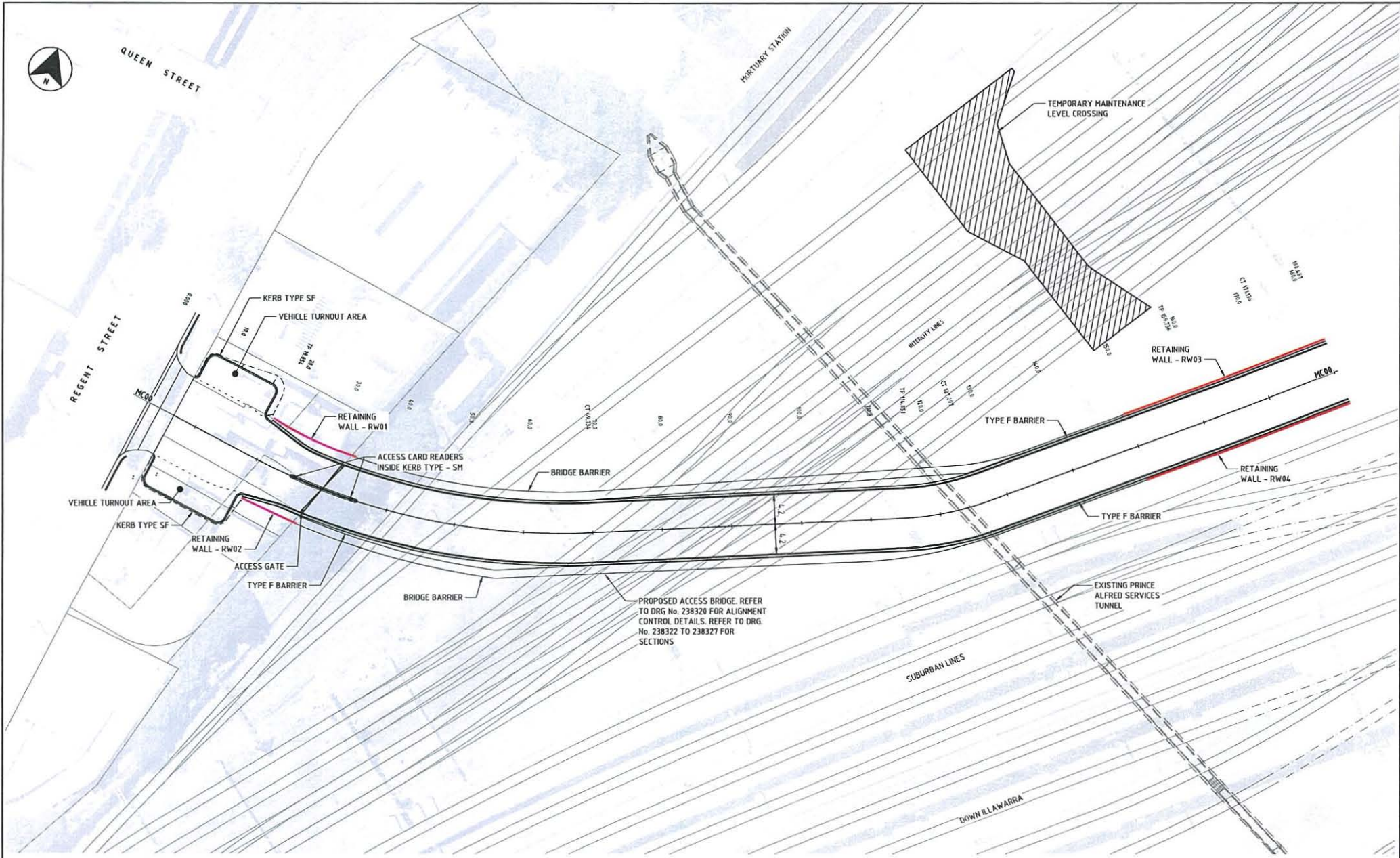
SERVICE PROVIDERS
DESIGNED BY: ANTHONY CHARLESWORTH DRG CHECK: ANTHONY CHARLESWORTH DESKTOP CHECK: ANDREW BROPHY APPROVED: JAM WATSON

SYDNEY METRO CITY & SOUTHWEST
 CENTRAL STATION
 URBAN / CIVIC DESIGN
 SYDNEY YARD ACCESS BRIDGE
 MATERIALS AND FURNITURE SCHEDULE

STATUS: CONTRACT SHEET 2 OF 2

NWRLSRT-PBA-SCS-EN-DWG-238914

100mm AT FULL SIZE Plot Date: 11/08/16 - 15:56



PLAN
SCALE 1:250

FOR INFORMATION ONLY

REV.	BY	DATE	DESCRIPTION	APPRO.
A	JS	12/08/16	ISSUED FOR REFERENCE DESIGN	BMV

SCALES	
1:250	FULL SIZE A1

Plot Date: 11/08/16 - 15:56



SERVICE PROVIDER	PARSONS BRINCKERHOFF	DRAWN	GREG MCELROY
	AECOM	DESIGNED	SANDY CHATTERJEE
	COX HASSELL	DRG CHECK	SANDY CHATTERJEE
		DESIGN CHECK	LINDSAY CLAYTON
		APPROVED	IAN WERTON

SYDNEY METRO CITY & SOUTHWEST	
CENTRAL STATION	
CIVIL	
SYDNEY YARD ACCESS BRIDGE	
GENERAL ARRANGEMENT	
STATUS: REFERENCE DESIGN	SHEET 1 OF 1
NWRL Drg No. NWRLSRT-PBA-SCS-CE-DWG-238321	NWRL REV. A

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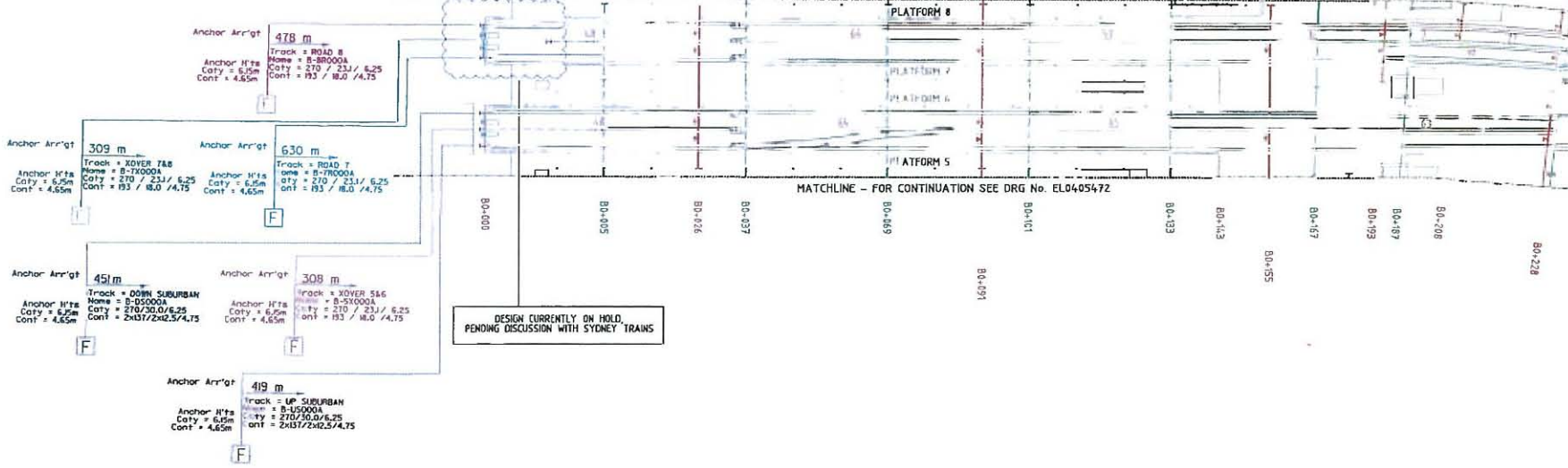
FROM SYDNEY

TO REDFERN

MATCHLINE - FOR CONTINUATION SEE DRG No. EL0405470

MATCHLINE - FOR CONTINUATION SEE DRG No. EL0405474

MATCHLINE - FOR CONTINUATION SEE DRG No. EL0405472



DESIGN CURRENTLY ON HOLD,
PENDING DISCUSSION WITH SYDNEY TRAINS

OBJECTIVE:

1. THE AIM OF SYDNEY YARD MODERNISATION PROJECT IS TO REPLACE IDENTIFIED LIFE EXPIRED OVERHEAD WIRING STRUCTURES AND IMPROVE OVERHEAD WIRING (OHW) DESIGN. THE OHW DESIGN IS IMPROVED BY CONVERTING EXISTING FIXED OHW SYSTEM WITH REGULATED OHW SYSTEM.
2. THIS OHW LAYOUT PROVIDES STRUCTURE SET OUT DETAILS WHICH WILL BE IMPLEMENTED IN THE DETAILED DESIGN.

NOTE:

1. ALL NEW STRUCTURES ON THE EXISTING TIMBER CANOPIES OVER THE PLATFORM AREA TO BE CONFIRMED BY STRUCTURAL ANALYSIS.

REFERENCE:

N398075-DH-DH-SURVEY
N398075-DH-PW-SURVEY

LEGEND:

- BLACK - EXISTING EQUIPMENT
- RED - NEW EQUIPMENT
- BLUE - MODIFIED EQUIPMENT
- GREEN - REMOVED EQUIPMENT

SCALE 1:500 (A3)
SCALE 1:1000 (A2)

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

NO.	REVISION	DATE	BY	CHKD	APPD
1	ISSUED FOR CHECKS				
2	FOR REVIEW				
3	FOR REVIEW				
4	FOR REVIEW				
5	FOR REVIEW				

AECOM
AECOM Australia Pty Ltd A.B.N. 28 852 844 925
60428466-40T-EL-0105471

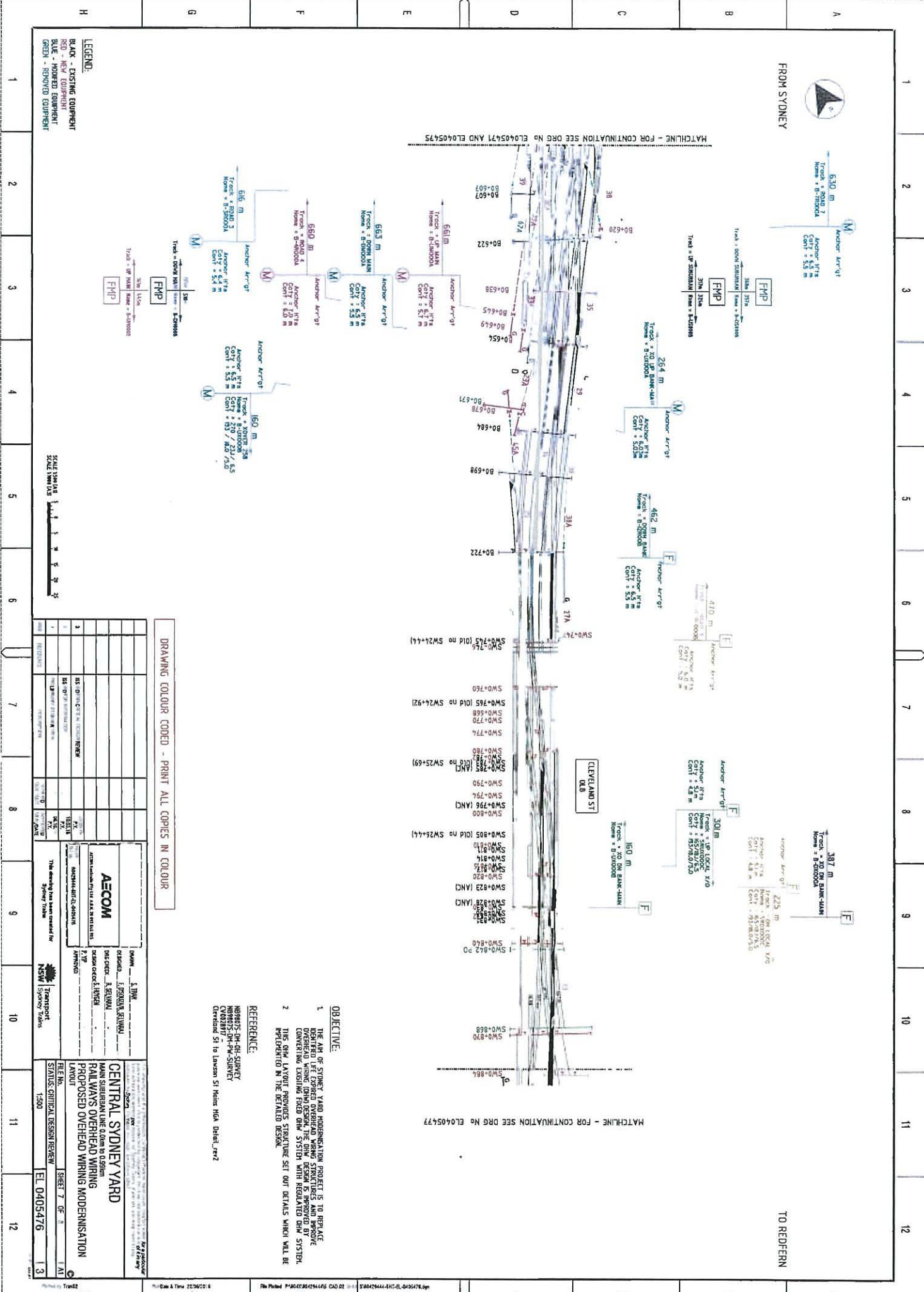
DRAWN: S. TRAM
DESIGNED: E. SELVAMAN SELVAMAN
DWG CHECK: A. SELVAMAN
DESIGN CHECK: S. HEYGEN
P. YIP
APPROVED

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CENTRAL SYDNEY YARD
MAIN SUBURBAN LINE 0.0km to 0.99km
RAILWAYS OVERHEAD WIRING
PROPOSED OVERHEAD WIRING MODERNISATION
LAYOUT

FILE No. SHEET 7 OF 8
STATUS: CRITICAL DESIGN REVIEW
EL 0405471 3

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FROM SYDNEY

TO REDFERN

LEGEND:

- BLACK - EXISTING EQUIPMENT
- RED - NEW EQUIPMENT
- BLUE - MODERN EQUIPMENT
- GREEN - MODIFIED EQUIPMENT

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

- OBJECTIVE:**
- 1 THE AIN OF SYDNEY YARD MODERNISATION PROJECT IS TO REPLACE IDENTIFIED LIFE EXPIRED OVERHEAD WIRING STRUCTURES AND IMPROVE RAILWAYS OVERHEAD WIRING MODERNISATION
 - 2 THIS PLAN LAYOUT PROVIDES STRUCTURE SET OUT DETAILS WHICH WILL BE REFERRED TO IN THE DETAILED DESIGN.

REFERENCE:

HARRIS-ON-DE-SURVEY
 HARRIS-ON-DE-SURVEY
 C/0028877 /
 CLEVELAND ST to Lawson St Heals WMA Detail.rvt2

<p>AECOM</p> <p>155 D'ENTREE STREET SYDNEY NSW 2009</p> <p>TEL: 61 2 9550 6200</p> <p>WWW.AECOM.COM</p>		<p>DESIGNED BY: S. BIRN</p> <p>CHECKED BY: J. BIRN</p> <p>DATE OF DESIGN: 27/08/2018</p> <p>DATE OF THIS DRAWING: 27/08/2018</p>
<p>THE DRAWING HAS BEEN CHECKED FOR CONFORMANCE WITH THE AECOM DRAWING CONTROL SYSTEM</p>		<p>PROJECT: CENTRAL SYDNEY YARD</p> <p>MAIN SUBURBAN LINE (L10) TO 0.250M RAILWAYS OVERHEAD WIRING MODERNISATION LAYOUT</p> <p>STATUS: CRITICAL DESIGN REVIEW</p>
<p>DATE: 27/08/2018</p> <p>TIME: 15:00</p>	<p>SHEET: 7 OF 8</p> <p>FILE NO: EL 0405476</p> <p>STATUS: 1</p>	<p>PROJECT NO: 1500</p> <p>DATE: 27/08/2018</p>

1 2 3 4 5 6 7 8 9 10 11 12

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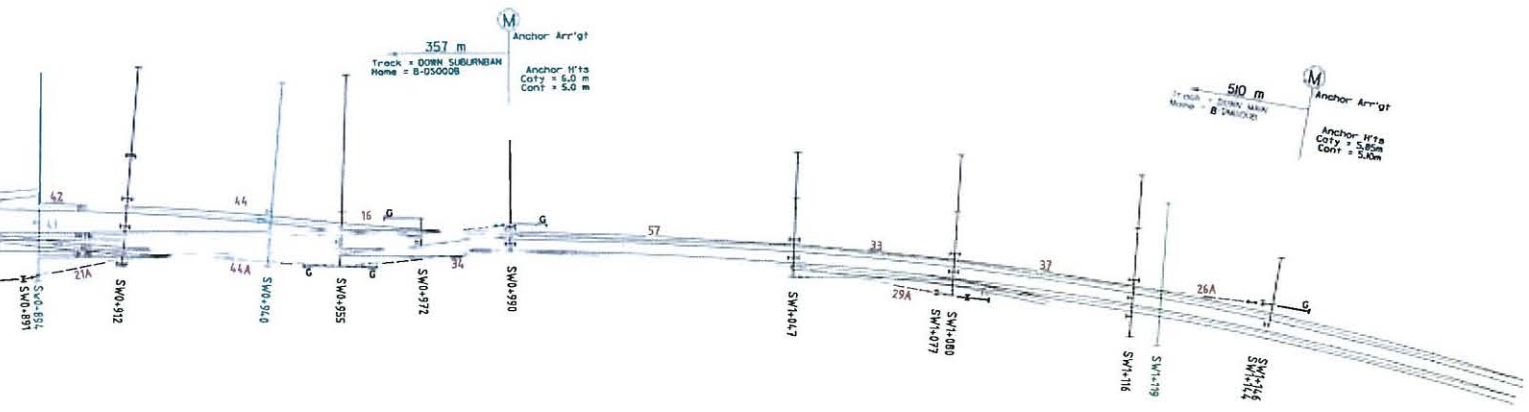
A
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C
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FROM SYDNEY

TO REDFERN

MATCHLINE - FOR CONTINUATION SEE DRG No EL0405476



OBJECTIVE:

- THE AIM OF SYDNEY YARD MODERNISATION PROJECT IS TO REPLACE IDENTIFIED LIFE EXPIRED OVERHEAD WIRING STRUCTURES AND IMPROVE OVERHEAD WIRING (OHW) DESIGN. THE OHW DESIGN IS IMPROVED BY CONVERTING EXISTING FIXED OHW SYSTEM WITH REGULATED OHW SYSTEM.
- THIS OHW LAYOUT PROVIDES STRUCTURE SET OUT DETAILS WHICH WILL BE IMPLEMENTED IN THE DETAILED DESIGN.

LEGEND:

- BLACK - EXISTING EQUIPMENT
- RED - NEW EQUIPMENT
- BLUE - MODIFIED EQUIPMENT
- GREEN - REMOVED EQUIPMENT

REFERENCE:

N898075-DH-01-SURVEY
N898075-DH-P4-SURVEY

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NO.	DESCRIPTION	DATE
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3	REVISED	
4	REVISED	
5	REVISED	
6	REVISED	
7	REVISED	
8	REVISED	
9	REVISED	
10	REVISED	
11	REVISED	
12	REVISED	

AECOM
AECOM Australia Pty Ltd ABN 99 004 919 919
44-41st-EL-0405477

Drawn: S. TIMM
Designed: F. PONDAR, S. VABAJ
Dwg Check: R. SELVAKAN
Design Check: S. HANSEN
P. YIP APPROVED

This drawing has been created for Sydney Trains

NSW Transport
Sydney Trains

CENTRAL SYDNEY YARD
MAIN SUBURBAN LINE 0.0km to 0.93km
RAILWAYS OVERHEAD WIRING
PROPOSED OVERHEAD WIRING MODERNISATION LAYOUT

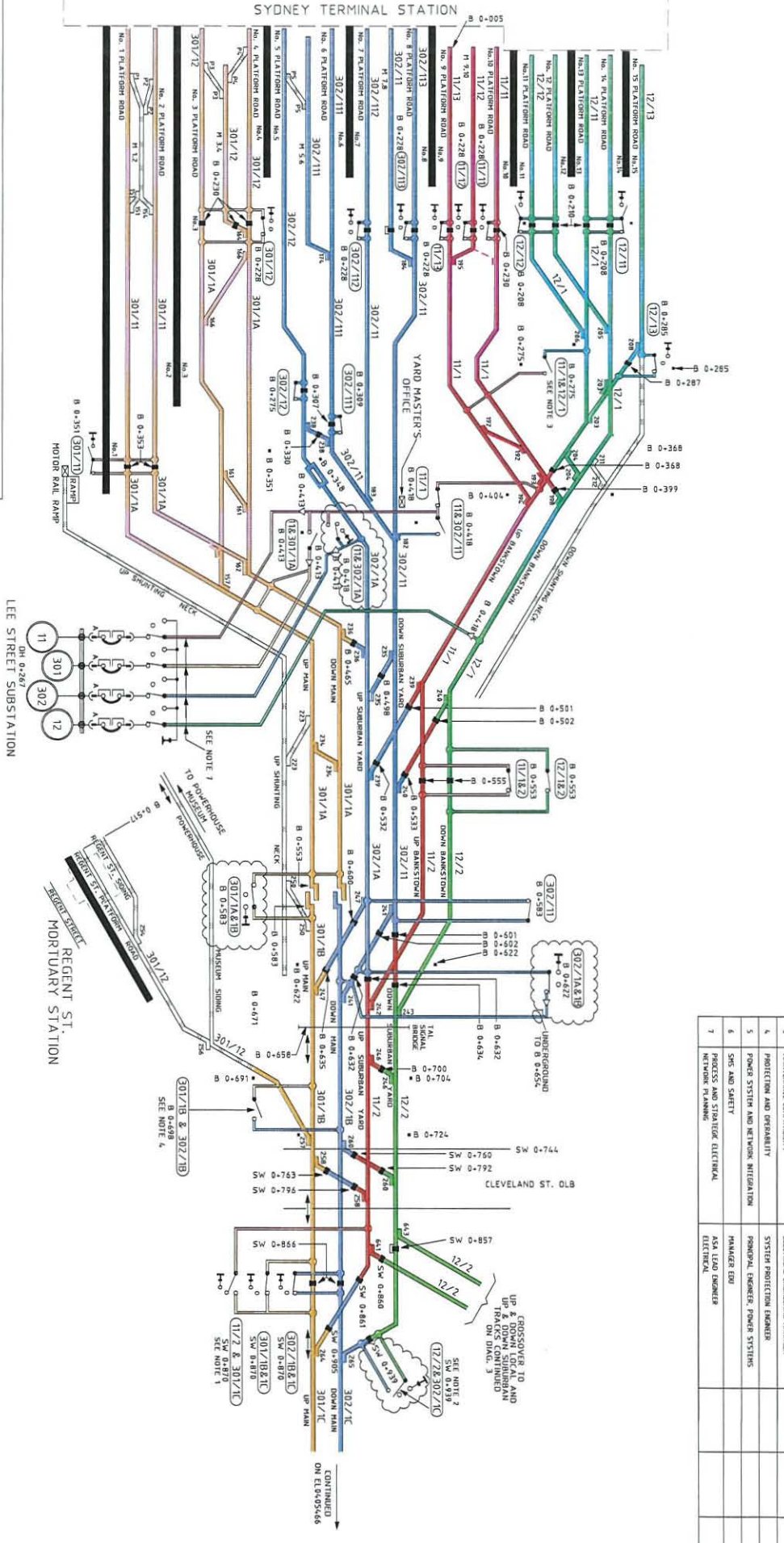
FILE No. SHEET 8 OF 8
STATUS: CRITICAL DESIGN REVIEW
1:500 EL 0405477

1 2 3 4 5 6 7 8 9 10 11 12

Per Draw & Title 20/06/2011
PHOTOGRAPHIC COPY
2444-511-RE-00077-04

OBJECTIVE:

- PROPOSED SECTIONING DIAGRAMS ELO405465 AND ELO405466 ARE SEEKING APPROVAL FOR SWITCH UPDATES FROM 2-POSITION.
- REFER TO ELO405466 FOR LIST OF SWITCH UPDATES.



- NOTES:**
- WHEN (T2Z & 302/C) IS CLOSED (301/B/C) MUST BE OPEN UNLESS EITHER 301 OR 11 IS OPEN AT LEE STREET SS.
 - WHEN (T2Z & 302/C) IS CLOSED (302/B/C) MUST BE OPEN UNLESS EITHER 302 OR 12 IS OPEN AT LEE STREET SS.
 - IF SWITCH (T1/1 & T2/2) IS CLOSED, DCA 11 OR 12 MUST BE OPEN.
 - WHEN SWITCH (301/B & 302/B) IS CLOSED, EITHER 301 OR 302 MUST BE OPEN AT LEE STREET SUBSTATION & 301 AND 302 MUST BE OPEN UNLESS AT LEAST ONE OF THE SWITCHES IN THE UP OR DOWN BASKET.
 - DCA 11 AND 12 MUST BE OPEN AT LEE STREET AND NEWTON SUBSTATIONS.

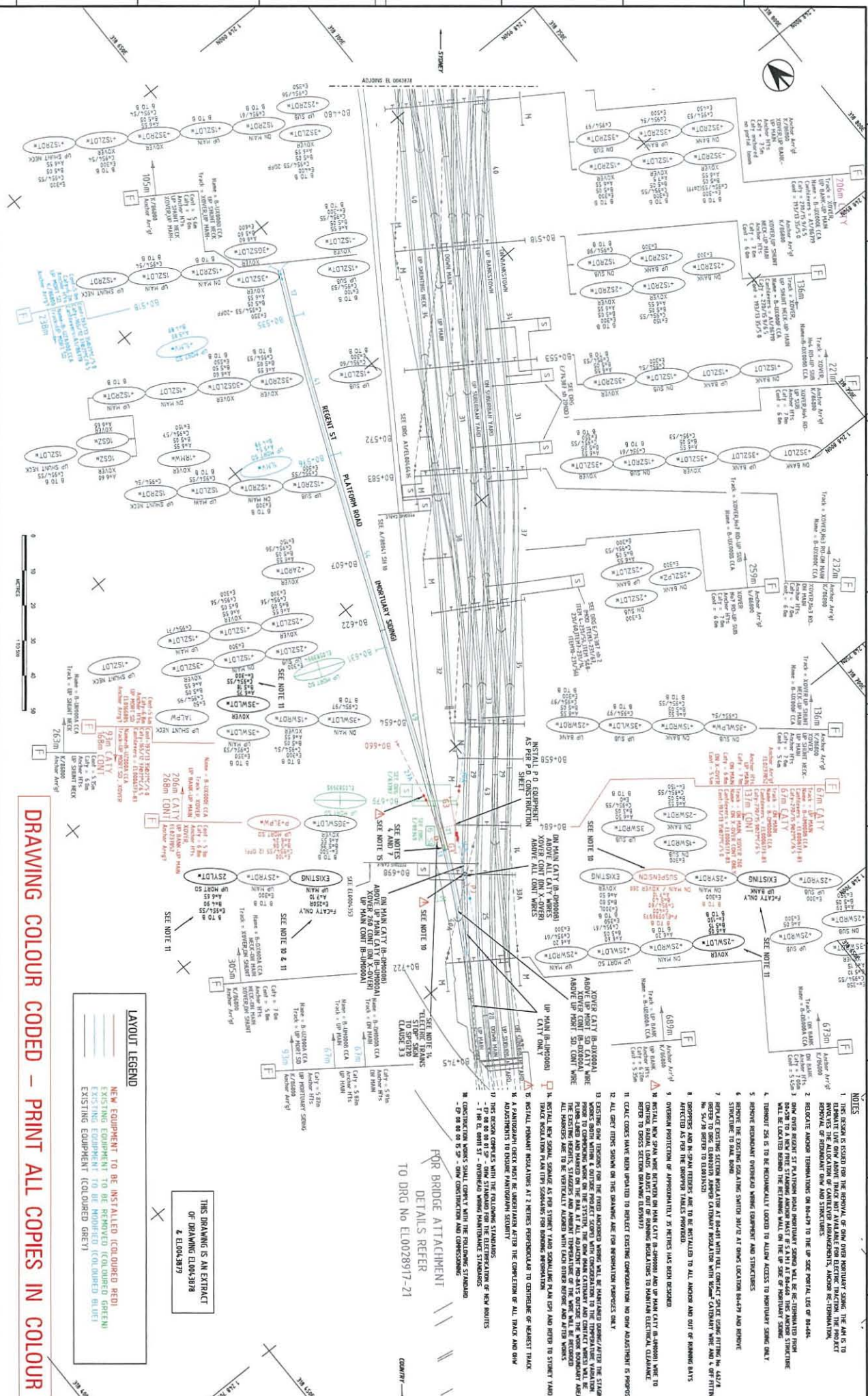
REFERENCES:

ELO386453
ELO385828, VA.

NO.	DESCRIPTION	DATE
1	SCORE SHEET	
2	DESIGNER'S CHECK	
3	ENGINEERING AND SYSTEMS INTEGRITY AND STANDARDS COMPLIANCE	
4	PROTECTION AND OPERABILITY	
5	POWER SYSTEM AND NETWORK INTEGRATION	
6	SMS AND SAFETY	
7	PROCESS AND STARTUP ELECTRICAL NETWORK PLANNING	

DRAWING COLOUR (CONTD) - PRINT ALL COPIES IN COLOUR

<p>AECOM</p> <p>1500 MARKET VILLAGE, SUITE 100, WEST WYOMING, CO 80501</p> <p>TEL: (303) 440-4000 FAX: (303) 440-4001</p> <p>WWW.AECOM.COM</p>		<p>PROJECT: CENTRAL SYDNEY YARD RAILWAYS OVERHEAD WIRING MODERNISATION</p> <p>CLIENT: NSW TRAINS</p> <p>DATE: 15/08/2016</p>	
<p>DESIGNER: S. WATTS</p> <p>CHECKER: C. FERROVACCHIO</p> <p>DATE: 15/08/2016</p>		<p>PROJECT NO: ELO405465</p> <p>SHEET NO: 1 OF 2</p>	



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LAYOUT LEGEND

- NEW EQUIPMENT TO BE INSTALLED (COLOURED RED)
- EXISTING EQUIPMENT TO BE REMOVED (COLOURED GREEN)
- EXISTING EQUIPMENT TO BE MODIFIED (COLOURED BLUE)
- EXISTING EQUIPMENT (COLOURED GREY)

THIS DRAWING IS AN EXTRACT OF DRAWING EL0043878 & EL0043879

FOR BRIDGE ATTACHMENT DETAILS REFER TO DRG No EL002897-21

- NOTES**
- THE SECTION IS SUBMITTED FOR THE REMOVAL OF OHW OVER THE BRIDGE. THE WORK TO BE DONE IS TO REMOVE THE EXISTING OHW AND TO INSTALL THE NEW OHW. THE WORK TO BE DONE IS TO REMOVE THE EXISTING OHW AND TO INSTALL THE NEW OHW.
 - RELOCATE ANCHOR TEMPLATES ON BRIDGE TO THE USE OF THE NEW OHW.
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ORIGINAL ISSUE	1	2	3	4	5	6	7	8	9	10	11	12
SCALE	1:500											
REFERENCE DRAWINGS	CIVIL - STRUCTURE DRAWING ELECTRICAL - ELECTRICAL LAYOUT MECHANICAL - MECHANICAL LAYOUT STRUCTURAL - STRUCTURAL SECTION CIVIL - CIVIL SECTION ELECTRICAL - ELECTRICAL SECTION MECHANICAL - MECHANICAL SECTION											
SYDNEY YARD	MAIN SUBURBAN LINE - 0.4km to 0.8km RAILWAYS OVERHEAD WIRING REMOVAL OF OHW OVER MORTUARY SIDING LAYOUT FILE NO. E021216370 SHEET 1 OF 1 STATUS: FOR CONSTRUCTION EL0521620											
DESIGNED BY	K. TONG											
CHECKED BY	S. BROWN											
DATE	22/09/2015											

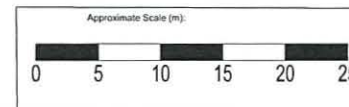


- LEGEND:**
- Approximate site boundary
 - Borehole / Well Location
BH1/ MW1
 - Approximate location of suspected UST
 - Inferred Groundwater Flow Direction

NOTES:
Figure 2 has been recreated from Google Maps

The borehole locations presented on this plan have been established from site measurements only and should not be construed as survey points.

Reference should be made to the report text for a full understanding of this plan.



Project Number: E27038KG	Title: Borehole/ Well Location Plan
Figure: 2	Address: 66-70 Regent Street Chippendale, NSW 2008

Appendix 3 Interface schedule



Sydney Metro City & Southwest

Sydney Yard Access Bridge Project Contract Schedules

Schedule C1

Scope of Works and Technical Criteria
Appendix 3
Interface Schedule

PROJECT	Sydney Metro City & Southwest	DATE	31 August 2016
GROUP	Sydney Metro City & Southwest	STATUS	FINAL
AUTHOR	Transport for NSW	REVISION	
COMPANY	Transport for NSW	FILE NUMBER	A5447784
FILE NAME	SYAB SWTC Appendix 3 (20160831Final)		

Contents

1	Interface Schedule	1
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1 Interface Schedule

- (a) The Contractor must:
 - (i) identify, engage with and co-ordinate the Interface Contractor in a timely manner to develop the design and complete the Contractors Activities to achieve the Completion Date;
 - (ii) program the Contractors Activities to provide the Interface Contractor with sufficient time to complete the Interface Contractors activities to meet the Contractors Program;
 - (iii) provide the Interface Contractor a minimum of 4 weeks notice for attendance to Site (unless noted otherwise);
 - (iv) meet and liaise with the Interface Contractor to ascertain the Interface Contractor's requirements;
 - (v) manage the performance of the Interface Contractor;
 - (vi) manage the interface between the Contractor and the Interface Contractor;
 - (vii) carry out all investigations, identify Services and generally ensure that all existing infrastructure is correctly identified by function and capacity and provide these to the Interface Contractor;
 - (viii) co-ordinate all proposed cable routes and equipment to be provided by the Interface Contractor with all of the Contractor's Activities and with all other Services and equipment; and
 - (ix) provide designated lay-down areas for Interface Contractors to store goods & equipment within the Site;
- (b) The Interface Contractor will:
 - (i) liaise with the Contractor with respect to all technical and operational requirements noted in the SWTC.

Interface Schedule

Low Voltage (LV) Power Supply		Interface Contractor: Sydney Trains (Customer Service Directorate, Customer Environment Division, Infrastructure Facilities Unit)	
System		Works By Contractor	Works By Interface Contractor
1	LV power supply	<p>The Contractor must:</p> <ul style="list-style-type: none"> a. Design, supply, install and commission new LV power supply to all services related to the Works including final termination and connections. b. Co-ordination preparation of Design Documentation with the requirements of the Interface Contractor including co-ordination with the final position of all other Utility Services and equipment. c. Supply records and Certificate of Compliance for the installed LV system, including for hard-wired LV distribution within the CCTV equipment cubicle. 	<p>The Interface Contractor will:</p> <ul style="list-style-type: none"> a. Witness and approve in writing the testing and commissioning as required. b. Review records and certification provided by the Contractor for the new LV power system and integrate into the existing network.

HV / LV relocation or protection		Interface Contractor: Sydney Trains (Customer Service Directorate, Customer Environment Division, Infrastructure Facilities Unit)	
System		Works By Contractor	Works By Interface Contractor
2	HV/LV cable relocation and or protection.	<p>The Contractor must:</p> <ul style="list-style-type: none"> a. Design, relocate and protect any existing HV/LV service routes which are required for the Works including final termination and connections. b. Co-ordination preparation of the Design Documentation with the requirements of the Interface Contractor including co-ordination with the final position of all other Utility Services and equipment. c. Supply records and Certificate of Compliance for the completed HV/LV relocation. 	<p>The Interface Contractor will:</p> <ul style="list-style-type: none"> a. Review the Design Documentation b. Witness and approve in writing the testing and commissioning as required. c. Review records and certification provided by the Contractor for the relocated HV/LV services.

CCTV		Interface Contractor: Sydney Trains (Indra)	
System		Works By Contractor	Works By Interface Contractor
3	CCTV	<p>The Contractor must:</p> <ul style="list-style-type: none"> a. Design the SYAB IP-based CCTV sub-system b. Design the SYAB communications systems cubicle, required to accommodate; CCTV, security (EAC) and OCDN equipment, and LV power supplies (including 2 hour UPS). c. Supply and install equipment cubicle. d. Supply and install AC distribution within the equipment cubicle (on the LV supply side and UPS output side). e. Supply and install communications earthing system to ASA standard T HR TE 21002 ST and referenced standards. f. Supply and install RJ45 patch panel required for patching between camera circuits and the CCTV customer access switch. g. Terminate CCTV cables at the patch panel end and as required to perform testing. h. Supply and install surge protection to all connecting copper cabling. i. Supply and install camera mounting poles and any mechanical adaptors or brackets required to allow fitment of the standard camera product supplied and installed by the Interfacing Contractor. j. Supply and install cable routes between equipment 	<p>The Interface Contractor will:</p> <ul style="list-style-type: none"> a. Review and approve the Contractor's CCTV sub-system design. b. Supply and install CCTV cameras, lenses, camera housings, CCTV Customer Access switch, PoE power supplies, CCTV UPS, and optic fibre and RJ45 patch cables as required at the SYAB site. Installation includes termination of cables at the camera end of copper cabling, and the supply of all patch cables required. c. Supply and install any equipment or connections, external to the Site and including within CENA36, that are required to integrate the SYAB sub-system to the Sydney Trains CCTV system. d. Integrate and commission the SYAB CCTV sub-system as part of the Sydney Trains CCTV system. e. Nominate the key type to be used to access the SYAB CCTV equipment cubicle.

CCTV		Interface Contractor: Sydney Trains (Indra)	
System		Works By Contractor	Works By Interface Contractor
		housing, cameras and LV supply. k. Supply, install and test all copper and optic fibre data cabling required, and provide verification and test results to the Interface Contractor.	

Electronic Access Control (EAC) System		Interface Contractor: TfNSW Transport Shared Services – People and Corporate Services – Manager Card & Security	
System		Works By Contractor	Works By Interface Contractor
4	Electronic Access Control (EAC)	<p>The Contractor must:</p> <ul style="list-style-type: none"> a. Design the SYAB extension to the TfNSW Electronic Access System to the Interface Contractor's requirements and standards. b. Supply and install the cable route between the equipment cubicle and EAC devices, including the interface between the cubicle-mounted EAC interface and the gate controller. c. Provide space within the SYAB communications systems equipment cubicle for a Sydney Trains ICT network switch. d. Supply and install all EAC cabling and equipment at the SYAB site, and any off-site equipment required to interface the SYAB extension with the existing TfNSW EAC system (other than Sydney Trains OCDN equipment and patch cords). e. Perform and document site acceptance tests of the SYAB extension to the TfNSW EAC system. 	<p>The Interface Contractor will:</p> <ul style="list-style-type: none"> a. Review and approve the Contractor's EAC extension design. b. Supply, install and test the ICT Customer Access switch at the SYAB communications equipment cubicle. c. Integrate the SYAB extension into the TfNSW EAC system, and commission.

Operation Critical Data Network		Interface Contractor: Sydney Trains	
System		Works By Contractor	Works By Interface Contractor
5	Operation Critical Data Network	<p>The Contractor must:</p> <ul style="list-style-type: none"> a. Supply and install cable containment to the Interface Contractor's design standards including any additional jointing pits required between the equipment housing and the nearest practical point of interface with the existing Sydney Trains cable route. b. Supply and install a FOBOT and optic patch panel to the Interface Contractor's specification at the end of the 24 core SMOF cable within the SYAB CCTV equipment cubicle. c. Supply, install, terminate and test single mode optic fibre (SMOF) cable to the Interface Contractor's specification and ASA standard T HR TE 01001 ST (and referred standards) between the equipment cabinet FOBOT and CENA36. At least 40m of slack cable will be left coiled within CENA36 for termination by the Interface Contractor. Testing by the Contractor will be by OTDR from the SYAB end of the cable only. d. All 24 cores must be terminated and extended to the patchable interface at the SYAB end of the cable. e. Provide fibre cable test results to the Interface Contractor. f. Accommodate the Interface Contractor supplied OCDN Provider Access switch within the equipment housing. 	<p>The Interface Contractor will:</p> <ul style="list-style-type: none"> a. Design the SYAB extension to the Sydney Trains OCDN. b. Allow access to the existing communications cable route between the Site and CENA36 (Central Station). c. Nominate a location within CENA36 for the entry point of the new 24 core SMOF cable. d. Review and accept one-way tested performance of the SYAB 24 core SMOF cable. e. Supply FOBOT and terminate the SYAB 24 core SMOF cable within CENA36. f. Test all cores of the SYAB 24 core SMOF cable in both directions and document. g. Supply and install the Provider Access switch (if required) and any other equipment and patch cables required to integrate the SYAB extension with the OCDN at Central Station. h. Oversight and Supervision of connection in to the existing cable service route.

Overhead Wiring Structures (OHWS) and Overhead Wiring (OHW) including catenary wires, jewellery and contact wires etc		Interface Contractor: Sydney Trains	
System		Works By Contractor	Works By Interface Contractor
6	OHWS and OHW	<p>The Contractor must:</p> <ul style="list-style-type: none"> a. Design, supply, install and commission the OHWS and OHW systems. b. Co-ordination of the Contractor' Design Documentation with the requirements of the Interface Contractor with OHW modification in Sydney Yard. c. Provide records and certification to the Interface Contractor. 	<p>The Interface Contractor will:</p> <ul style="list-style-type: none"> a. Witness and approve in writing the testing and commissioning as required. b. Review records and certification supplied by the Contractor for acceptance of the new OHWS and OHW system into the existing network.

Signalling		: Interface Contractor: Sydney Trains / Maintenance Directorate / Major Works / Signal	
System		Works By Contractor	Works By Interface Contractor
7	Signalling	<p>The Contractor must:</p> <ul style="list-style-type: none"> a. Investigate, plan, coordinate, design and execute works in line with the SYAB Signalling Functional Specification and ASA standards b. Perform all installation, testing and commissioning of signalling system (excluding integration with control systems). c. Provide records / certification for integration and commissioning of signalling. d. The Contractor shall request the Interface Contractors attendance (minimum 12 weeks prior to requirement) for any commissioning. e. The Contractor is to co-ordinate with the Interface Contractor onsite, to witness that the signals are integrated with Sydney Trains control systems. f. Arrange for a signal sighting committee where required, in accordance with Sydney Trains standards. g. Aside from the above, the Contractor is to protect existing signal assets during the works. This includes informing the Interface Contractor when undertaking construction work within 3 metres of signal cables. 	<p>The Interface Contractor will:</p> <ul style="list-style-type: none"> a. Integrate and test all interfaces between the signaling system and Sydney Trains control systems. b. Provide stakeholders for the signal sighting committee as required.

Appendix 4 Signalling Functional Specification



Sydney Metro City & Southwest

Sydney Yard Access Bridge Project Contract Schedules

Schedule C1

Scope of Works and Technical Criteria
Appendix 4
Signalling Functional Specification

PROJECT	Sydney Metro City & Southwest	DATE	31 August 2016
GROUP	Sydney Metro City & Southwest	STATUS	FINAL
AUTHOR	Transport for NSW	REVISION	
COMPANY	Transport for NSW	FILE NUMBER	A5463685
FILE NAME	SYAB SWTC Appendix 4 (20160831Final)		

Contents

1	Signalling Functional Specification	1
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1 Signalling Functional Specification

- (a) The Signalling Functional Specification is included at Attachment 1 to this Appendix 4.

Attachment 1



Transport
for NSW



city & southwest

Transport for NSW

Sydney Metro – City & Southwest – Technical Services

Signalling Functional Specification – Sydney Yard Access
Bridge

Reference Design

5 August 2016

Document No: NWRLSRT-PBA-SCS-SI-SPC-000001

Revision No: 1

Document information

Client: Transport for NSW
Title: Sydney Metro – City & Southwest – Technical Services
Subtitle: Signalling Functional Specification – Sydney Yard Access Bridge
Document No: NWRLSRT-PBA-SCS-SI-SPC-000001
Date: 5 August 2016

Rev	Date	Details
A	17/05/2016	Draft
1	05/08/2016	Final - Updated to Stakeholders (ASA, Sydney Trains and TfNSW) comments

Author, Reviewer and Approver details

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Distribution

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Contents

	Page number
1. Introduction	1
1.1 Reference Documents	2
2. Operational requirements	3
3. Line speeds	4
3.1 Existing Line Speeds	4
3.2 Proposed Line Speeds	4
4. Existing signalling equipment and interfaces	5
4.1 Existing Equipment	5
4.2 External Interfaces	5
5. Proposed signalling works	6
5.1 Overview	6
5.2 Train Control System	6
5.3 Signalling Interlocking Configuration and Equipment	6
5.4 Signalling Distribution Boxes	7
5.5 Cabling and Cable Routes	7
5.6 Signals	8
5.7 Track Circuits / Train Detection	8
5.8 Signalling Power Supply	8
5.9 Pneumatic Air Supply	8
5.10 Buffer Stops	8
5.11 Bonding	8
5.12 Signalling Equipment Recoveries	8
6. Existing, New and altered routes and points	9
6.1 Existing and Altered Signal Routes	9
6.2 New Signal Routes	9
6.3 Existing and Altered Points	9
6.4 New Points	9
7. Staging works	10

7.1	Staging Overview	10
7.2	Sydney Yard Signalling Stage Works	10

List of tables

		Page number
Table 4.1	Existing equipment – Sydney West Yard	5
Table 6.1	Existing signals / routes	9
Table 6.2	Points alteration	9

List of figures

Page number

No table of figures entries found.

List of appendices

Appendix A	Existing Signalling Arrangement
Appendix B	Proposed Signalling Arrangement
Appendix C	Proposed Access Bridge

1. Introduction

Sydney Metro - City & Southwest project is the subsequent stage of Sydney Metro – Northwest project. The Northwest project will address all scope from Cudgegong to Chatswood. The City & Southwest project addresses all scope of works between Chatswood and Bankstown.

The Sydney Metro – City & Southwest project is an extension of the Northwest project and it comprises of three key components as follows:

- Sydney Metro – City – 16.5 km City Extension from Chatswood, under North Sydney and Sydney Harbour and then beneath the Sydney CBD to Central and Sydenham.
- Sydney Metro – Southwest – 13.4 km Southwest Extension – Sydenham to Bankstown.
- Sydenham Stabling Facility.

The signalling for the Sydney Metro – City & Southwest will be a Communications Based Train Control (CBTC) system, employing integrated Automatic Train Protection (ATP) and Automatic Train Operation (ATO) with Unattended or Driverless Train Operation (UTO or DTO). The new interlocking commissioned as part of the Sydney Metro – Northwest project will be extended to control the area from Chatswood to Bankstown with the Operations and Control Centre (OCC) to be located at Tallawong with a backup at Bella Vista.

Under the greater Central station complex, the existing Sydney Yard consists of various terminal platforms to accommodate different types of train services. As part of development of the new Central Metro station, the following modifications will be completed in the area:

- It is proposed to shorten intercity platforms 9-14 by moving the concourse end of the platforms to the south. To maintain the current operational platform lengths the six platforms will be extended at the southern ends. The proposed platform extensions will not cater for 205m long New Intercity Fleet trains.
- Intercity platform 15 and its associated track including the Down Shunting Neck will be permanently removed.
- A new vehicle access bridge will be constructed coming from Regent Street near the Mortuary platform and crossing all tracks leading to platforms 1-15. This bridge will initially be used during the construction phase of the Sydney Metro platforms and later on will be retained for maintenance access. To accommodate the construction of this Access Bridge, the existing Up Shunting Neck will be shortened at the southern end. The bridge construction will be completed during possession hence there will be no impact on Sydney Trains operation during construction.
- In the area between the Suburban and Yard tracks the placement of the bridge impacts some local signal cable routes and pneumatic air system. The impacted services will be relocated to make way for the construction of the bridge piers.
- A new temporary at-grade ballast crossing will be required during construction, immediately behind SY77 signal. This crossing will replace the current temporary crossing located behind SY90 signal, which Sydney Trains presently use for maintenance purpose. Due to this temporary crossing, a portion of the existing Pneumatic Air System steel pipes will be replaced by flexible pipes and will run via the existing Ground Level Trough (GLT). To protect the GLT from vehicles, steel plates will be used as required.

Due to the above changes there will be modifications to the existing West Yard NX Relay Interlocking and Pneumatic system controlling Sydney Yard.

This Signalling Functional Specification (SFS) is one of the two SFSs, which will describe the changes to the Sydney Trains network around Central station due to the implementation of Sydney Metro project at Sydney Yard. The two SFSs are:

- NWRLSRT-PBA-SCS-SI-SPC-000001 – Sydney Yard Access Bridge SFS (this document)
- NWRLSRT-PBA-SCS-SI-SPC-000002 – Sydney Yard Platform and Track Modifications SFS

This SFS will cover the signalling changes as a result of the access bridge construction which will include modification of the West Yard relay interlocking, Mimic Control panel and the future ATRICS system. Further, this SFS will cover the proposed changes to the Pneumatic system for the at-grade temporary crossing.

1.1 Reference Documents

The following documents have been referred to in preparation of this document:

- NWRLSRT-PBA-SCS-CE-DWG-389435-Regent Street – Version A (dated 13 April 2016)
- NWRLSRT-PBA-SCS-ST-DWG-380761-SK1 – Version A (dated 13 April 2016)
- Existing Signalling Plan: SYD_YARD_SP (dated: 15 Dec 2014)
- CB RR Sydney Relay Room Book 2 of 9 (dated: 6 May 2015)
- Sydney Signal Box West Yard Book A (dated: 11 Sep 2009)
- Sydney Signal Box West Yard Book B (dated: 21 Sep 2009)
- Sydney Signal Box West Yard Book C (dated: 22 Sep 2009)
- Sydney Yard Pneumatic system Book 3 of 6 (dated 30 April 2007)
- ASA Signalling Standards
- Other sources include RFIs and Interface meeting minutes

2. Operational requirements

The Up Shunting Neck is currently being used on every Wednesday for storage of the locomotives off the Indian Pacific. The locomotives are stored on the Up Shunting Neck between SY77 and SY83 shunt signals. The current run-off is used for occasional storage of Indian Pacific locomotives. The locomotives access the Up Shunting Neck from platforms 1 and 2.

To facilitate the construction of the new Regent St access bridge, the existing Up Shunting Neck will be shortened. The bridge piers will be located in the middle of where the existing shunting neck was (for details see Appendix C).

The shortening of the Up shunting neck will lead to the removal of 250B catch points and a provision of a full run-off road in front of signal SY83. The run-off road will be fitted with a friction buffer stop and buffer stop light. The new layout detail is shown in Appendix B.

Indian Pacific will continue to be able to store their locomotives between SY77 and SY83 signals. SY83(S)B route will be permanently removed. Trains will not be authorised to pass beyond the SY83 signal into the run-off road, any train that passes will be derailed. Trains will now approach SY83 shunt signal to either turn back or to proceed to the Up Main line.

3. Line speeds

3.1 Existing Line Speeds

Existing line speeds obtained from TS TOC.2 dated 06 May 2016 for the Sydney Shunting Neck is 25km/h.

3.2 Proposed Line Speeds

There are no proposed new speeds in this area as part of Sydney Metro – City & Southwest project.

4. Existing signalling equipment and interfaces

The Sydney Yard interlocking was commissioned in 1980, as a relay NX route setting signalling system. The relay based interlocking has no facility for remote control. It is currently controlled from a TD push button Mimic Control Panel located at Sydney Signal Box.

4.1 Existing Equipment

The existing signalling equipment for Sydney West Yard is listed on the table below:

Table 4.1 Existing equipment – Sydney West Yard

Item	Type
Signals	Incandescent – Westinghouse SL35 lamps – SY83 LED Signals – SY90, SY104, SY105, and SY107
Track Circuits	Single rail AC track circuit
Points	Style A (for 250B & C points)
Interlocking	NX Route Relay Interlocking
Train Control	Sydney Signal Box Mimic Control Panel – Stage 1 Homebush Signal Box ATRICS – Stage 2

4.2 External Interfaces

There are no external interfaces that will be considered as part of the scope of works.

5. Proposed signalling works

5.1 Overview

The proposed signalling works include:

- Removal of SY90 signal and associated equipment.
- Implementing the signals sighting committee recommendation for SY104, SY105 and SY107 signals.
- Removal of 250B catch points.
- Removal of USNAT track circuit.
- Modification to the existing air system.
- Cable routes relocation – if necessary.
- Modification of Sydney Signal Box West Yard Relay Interlocking.
- Modification of mimic control panel and TD/TVS
- Modification of ATRICS.

Due parallel projects around Sydney Yard, an interface agreement will be required between the detail design house and Sydney Trains to effectively manage the source documents and other projects interface.

5.2 Train Control System

5.2.1 Mimic Control Panel

Sydney West Yard interlocking is controlled via a tiled push-button Mimic Control and Indication panel located at Sydney Signal Box. The existing Mimic Control panel is planned to be replaced by Advanced Train Running Information Control System (ATRICS) to be located at Homebush Signal Box. The ATRICS system is planned to be commissioned in May 2018.

Since the Mimic Control Panel will be decommissioned with the rollout of the ATRICS, the current proposal is to minimise any changes on the panel. SY90 signal push button will be removed and a permanent type patch over sticker will be used to cover any redundant indications. Existing 250C points to be renamed 250B points on the panel. Routes which will no longer be used will be fitted with collar blocking facilities to ensure they are blocked or booked out of use in the panel.

It is proposed that the second stage of the project to be delivered once the ATRICS rollout has been completed. The ATRICS will then be modified for the changes to the infrastructure as proposed in this document.

5.3 Signalling Interlocking Configuration and Equipment

The Sydney West Yard relay interlocking will be modified to reflect the removal of SY90 signal and 250B catch points and the associated track circuit.

The sections below outline the final signalling scope of works that is to be completed as part of the Up Shunting Neck shortening. This scope of works will be delivered in two stages as described in Section 7.

5.3.1 Sydney Box – West Yard Interlocking

Sydney Box which houses the West Yard interlocking will be modified as follows:

- Removal of interlocking circuits for SY83(S)B route and associated relays.
- Removal of interlocking circuits for SY90(S) route and associated relays.

5.3.2 Relay Room 2

Due to the construction of the overbridge and shortening of the Up Shunting Neck, some signalling changes will be required in Relay Room 2, this includes but is not limited to:

- Removal of USNAT track relay & repeater circuits to Yard master panel.
- Modification to the signal control circuits for SY83 to remove the B route and associated relays.
- Removal of signal control and lighting circuits for signal SY90 and associated relays.
- Removal of 250B catch points detection circuits and associated relays.
- Renaming existing 250C points to 250B points.

5.4 Signalling Distribution Boxes

Initial investigation suggests that the shortening of the Up Shunting Neck will result in the modification in the input / output cables in some of the distribution boxes as specified below. These works will be delivered in two stages as indicated in Section 7.

5.4.1 DB2/4

Following modifications will be required at DB2/4:

- 1 x 20c cables from Relay room 2 – removing the functions associated with SY83(S)B route.
- 1 x 8c cables to SY83 Signal base – removing the functions associated with SY83(S)B route.
- 1 x 50c cables from Relay room 2 – removing the functions associated with SY90 route.
- 1 x 4c cables to SY90 Signal base – cable to be recovered.
- 2 x 2c Hypalon steel cables to USNAT track side equipment (Relay) – Cable to be recovered.

5.4.2 DB2/4A

Following modification will be required at DB2/4A:

- 1 x 15c cables to 250B Slave "A" valve unit – cable to be recovered.

5.4.3 DB2/5

Following modifications will be required at DB2/5:

- Removal of USNAT track feed.
- 2 x 2c Hypalon steel cables to USNAT track side equipment (Feed) – cable to be recovered.
- Relocation of the buffer stop lights to the new position and provision of new cables.

5.5 Cabling and Cable Routes

The proposed design of the access bridge is such that construction works will avoid all the existing cable routes as per the DSS. However, in the area between the Suburban and Yard tracks there are some signal cable routes that will be impacted by the construction of the bridge piers.

The impacted signal cables routes are highlighted in Appendix C. Site investigation during the detail design phase of the project will confirm these services to be relocated as required.

5.6 Signals

As a result of Up Shunting Neck length reduction, signal SY90 will be removed.

The proposed design for the new Regent Street Bridge will introduce signal sighting issues to the existing gantry signals SY104, SY105 and SY107. The impact should be assessed by a sighting committee to recommend a solution.

5.7 Track Circuits / Train Detection

The Up Shunting Neck track circuits will be modified. USNAT track circuit with its associated equipment to be recovered.

5.8 Signalling Power Supply

There is no power supply changes proposed as part of the access bridge construction at Sydney Yard.

5.9 Pneumatic Air Supply

The air system around Sydney Yard will be modified to reflect the removal of 250B catch points. The existing 250C points will be renamed 250B points. Further the air system will be modified for the temporary ballast at-grade bridge. Flexible pipes will replace steel pipes and will be underground at the position of the crossing.

The bridge piers position will impact the existing route of the pneumatic air system between the Yard and Suburban tracks. The impacted area is shown in Appendix C. Site investigation during the detail design phase will be required to confirm the air pipes impacted and to be relocated.

5.10 Buffer Stops

New friction buffer stop will be installed at the end of the Up Shunting Neck. The buffer stop will be fitted with fixed red and a white light above.

5.11 Bonding

Due to Up Shunting Neck shortening, the track bonding will be modified to reflect the changes.

5.12 Signalling Equipment Recoveries

All signalling equipment recovered from Sydney Yard will be disposed by the project in agreement with Sydney Trains.

6. Existing, New and altered routes and points

6.1 Existing and Altered Signal Routes

There are no new routes proposed. The following existing signal routes at Sydney Yard will be altered as part of the Sydney Metro – City & Southwest project:

Table 6.1 Existing signals / routes

Signal	Km	Route	Description	Route Indicator	Remarks
SY83		S(A)	Shunt, Up Main	UM	(S)B route removed. Route indicator 'SN' removed
		S(B)	Shunt, Up Shunting Neck	SN	
SY90			Shunt, Up Shunting Neck		Signal removed.

6.2 New Signal Routes

There are no new signals or routes that are proposed for the Sydney Trains network as part of the Sydney Metro – City & Southwest project– Sydney Yard Access Bridge.

6.3 Existing and Altered Points

The following points will be removed or altered.

Table 6.2 Points alteration

Points No	Description	Remarks
250B	Catch Points Up Shunting Neck	Removed Existing 'A' Slave clawlock points
250C	Crossover Up Shunting Neck to Up Main	Rename to 250B Existing 'A' Slave spherolock points

6.4 New Points

There are no new points that are proposed at Sydney Yard as part of this project.

7. Staging works

7.1 Staging Overview

In the development of the new Central Metro station as part of Sydney Metro – City & Southwest project; the design needs to be integrated spatially into the existing greater Central station complex. To enable equipment and material to be taken to and from the area of construction of the new Sydney Metro station, an access bridge from Regent Street over the track roads leading to platforms 1-15 will be constructed. This will lead to the reduction of the Up Shunting Neck length and a temporary at-grade crossing near DB2/2 location.

At the time of producing this document the access bridge constructability plan, the permanent way and OHW staging works around the up shunting neck were not finalised, hence the proposed signalling stage works break down is not an exhaustive list, and is intended to enable a comparative assessment to identify preferred options for further design development.

7.2 Sydney Yard Signalling Stage Works

7.2.1 Stage 1 – Early Works

The early works will involve bridging-out of equipment to ensure that the construction of the access bridge can be started. This bridging-out of equipment will be temporary and will be removed in stage 2.

- Removal of signal SY90 lighting circuit.
- Complete signal sighting for SY104, SY105 and SY107 and implement the recommendation.
- The panel indication to be covered and the panel control button to be removed and covered.
- Modification of SY83(S) route indicator to remove B route and false feeding the 83B interlocking circuitry.
- Removal of 250B catch points operating and detection circuits.
- Removal of 250B catch points from the M307 air system manifold.
- Rename existing 250C points to 250B points.
- The panel indication for 250B catch points to be patched with a permanent type sticker.
- The panel indication for 250C points to be renamed to 250B points.
- Remove USNAT track relay and feed. The panel indication for this track circuit to be patched with a permanent type sticker.
- Removal of the existing buffer stop lights at the end of the Shunting Neck.
- Installation of a new buffer stop lights to the new buffer stop location.
- The piers between the yard tracks and suburban tracks are likely to impact the services routes in the area. Site survey will be required to establish the need for cable route re-routing.
- Modifying the compressed air system for the at-grade crossing between DB2/2 location and SY83 signal.
- Construction, Testing and Commissioning of the completed scope of works

7.2.2 Stage 2 – Interlocking Modifications

It is proposed the commencement of this stage to be delayed until after ATRICS has been rolled out in May 2018 and the Mimic Control panel decommissioned. Following is the signalling scope of works to be carried out:

- Removal of SY83(S)B route redundant circuitry and equipment.
- Removal of signal SY90 redundant circuitry and equipment.
- Modify the interlocking circuitry in Relay Room 2 and Sydney Box West Yard Interlocking.
- Construction, Testing and Commissioning of the completed scope of works.

Appendix A

Existing Signalling Arrangement

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
59	59A	PLATFORM 11	11	STENCIL
	59B	PLATFORM 14	14	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
60	60A	PLATFORM 14	14	STENCIL
	60B	PLATFORM 15	15	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
68	68(M)A	DOWN SUBURBAN	-	-
	68(M)B	DOWN MAIN	M	MLRI
	68(S)A	DOWN SUBURBAN	DS	STENCIL
	68(S)B	UP SUBURBAN	US	STENCIL
	68(S)C	DOWN MAIN	DM	STENCIL
68(S)D	UP MAIN	UM	STENCIL	

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
74	74(M)A	PLATFORM 9	9	MLRI
	74(M)B	PLATFORM 10	10	MLRI
	74(M)C	PLATFORM 11	11	MLRI
	74(M)D	PLATFORM 12	12	MLRI
	74(M)E	PLATFORM 13	13	MLRI
	74(M)F	PLATFORM 14	14	MLRI
	74(M)G	PLATFORM 15	15	MLRI
	74(S)A	PLATFORM 9	9	STENCIL
	74(S)B	PLATFORM 10	10	STENCIL
	74(S)C	PLATFORM 11	11	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
73	73A	PLATFORM 6	P6	STENCIL
	73B	PLATFORM 8	P8	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
75	75X	PLATFORM 9	9	MMLRI
	75A	PLATFORM 10	10	MMLRI
	75B	PLATFORM 14	14	MMLRI

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
79	79A	UP BANKSTOWN	U	MMLRI(UP)
			B	MMLRI(LOW)
	79B	UP SUBURBAN	U	MMLRI(UP)
			S	MMLRI(LOW)
	79D	UP MAIN	U	MMLRI(UP)
			M	MMLRI(LOW)

NOTE: SHUNT SIGNAL SPEED 10kph EXPECT PLATFORM TO BE OCCUPIED

(N.B.) INDICATING PLATES ARE PLACED ON TOP OF SHUNTING SIGNALS

(N.B.) INDICATING PLATES ARE PLACED ON TOP OF SHUNTING SIGNALS

TO PLATFORMS 9 - 14 SYDNEY TERMINAL CONCOURSE

TO PLATFORMS 1 - 8 SYDNEY TERMINAL CONCOURSE

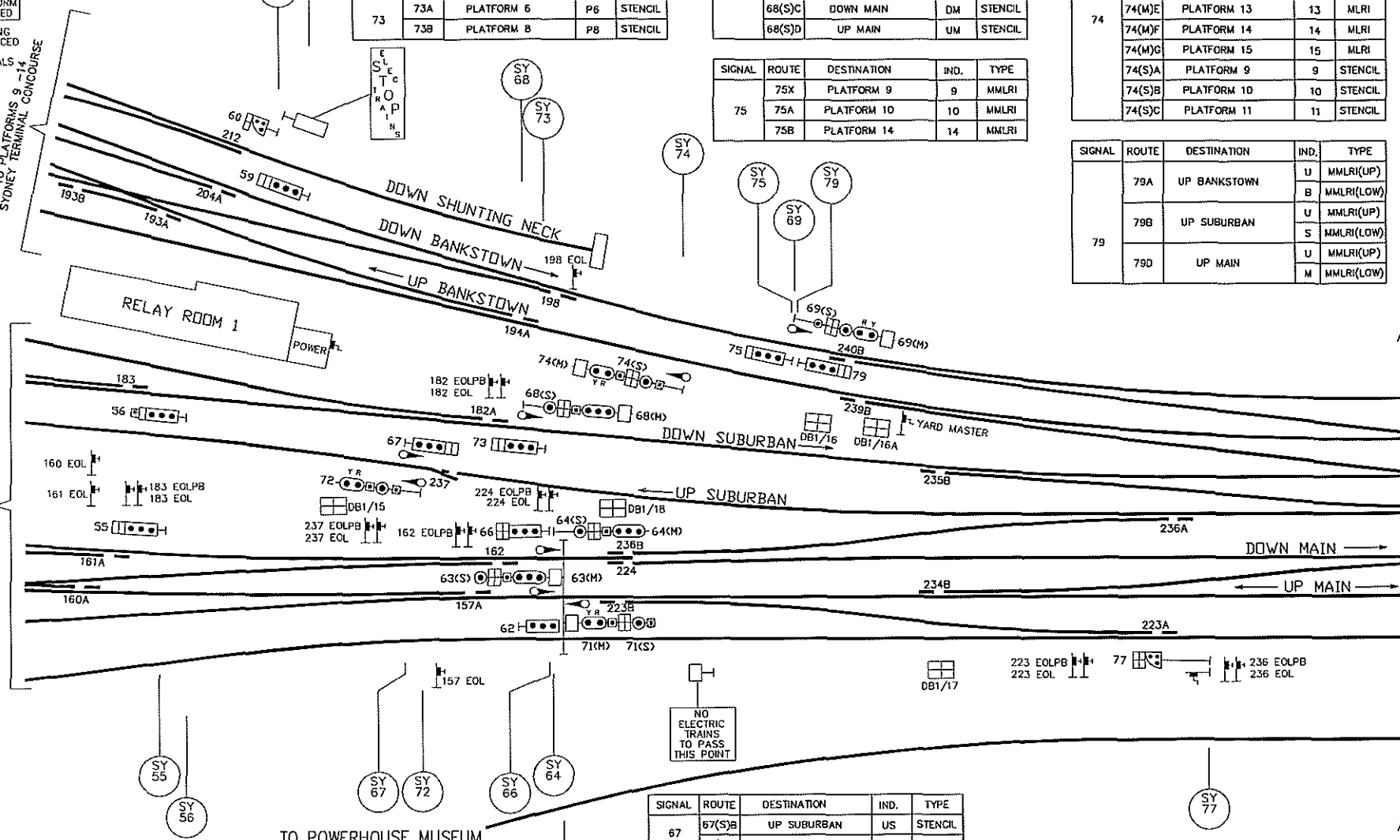
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SIGNAL	ROUTE	DESTINATION	IND.	TYPE
63	63(M)A	DOWN MAIN	D	MLRI
	63(M)B	UP MAIN	U	MLRI
	63(S)B	DOWN MAIN	DM	STENCIL
	63(S)C	UP MAIN	UM	STENCIL
	63(S)D	UP SHUNTING NECK	SN	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
69	69(M)B	DOWN MAIN	M	MLRI
	69(S)A	DOWN BANKSTOWN	DB	STENCIL
	69(S)B	DOWN SUBURBAN	DS	STENCIL
	69(S)C	DOWN MAIN	DM	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
67	67(S)B	UP SUBURBAN	US	STENCIL
	67(S)D	UP MAIN	UM	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
64	M	DOWN MAIN	-	-
	64(S)A	BOOKED OUT OF USE	US	STENCIL
	64(S)B	BOOKED OUT OF USE	DM	STENCIL
	64(S)C	BOOKED OUT OF USE	UM	STENCIL



NO ELECTRIC TRAINS TO PASS THIS POINT



**SYDNEY YARD - ACCESS BRIDGE
PROPOSED DRIVERS DIAGRAM
SIGNALLING ARRANGEMENT SHEET 1 OF 3**

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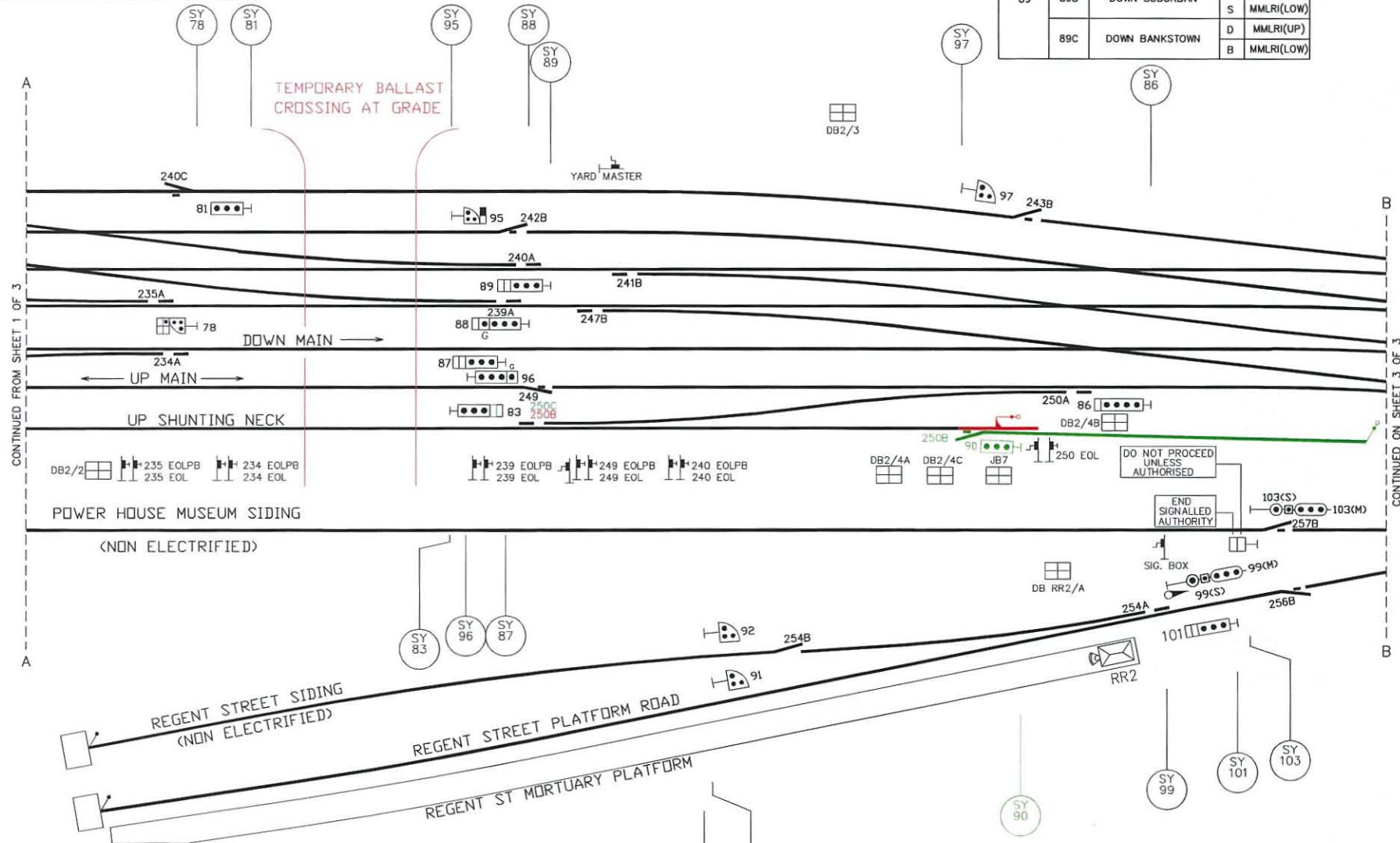
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Plotted by: WATTS, STEVE

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
78	78A	UP SUBURBAN	US	STENCIL
	78B	DOWN SUBURBAN	DS	STENCIL
	78X	DOWN MAIN	DM	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
83	83A	UP MAIN	UM	STENCIL
	83B	SHUNTING NECK	SN	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
86	86A	SHUNTING NECK	N	MMLRI
	86B	UP MAIN	M	MMLRI

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
89	89A	OUT OF USE	U	MMLRI(UP)
			S	MMLRI(LOW)
	89B	DOWN SUBURBAN	D	MMLRI(UP)
			S	MMLRI(LOW)
	89C	DOWN BANKSTOWN	D	MMLRI(UP)
			B	MMLRI(LOW)



SIGNAL	ROUTE	DESTINATION	IND.	TYPE
88	88A	OUT OF USE	-	MMLRI
	88B	OUT OF USE	-	MMLRI
	88C	OUT OF USE	-	MMLRI
	88D	UP SUBURBAN	S	MMLRI
	88E	UP BANKSTOWN	B	MMLRI

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
87	87A	OUT OF USE	C	MMLRI(UP)
			S	MMLRI(LOW)
	87B	UP MAIN	U	MMLRI(UP)
M			MMLRI(LOW)	
87C	DOWN MAIN	D	MMLRI(UP)	
		M	MMLRI(LOW)	

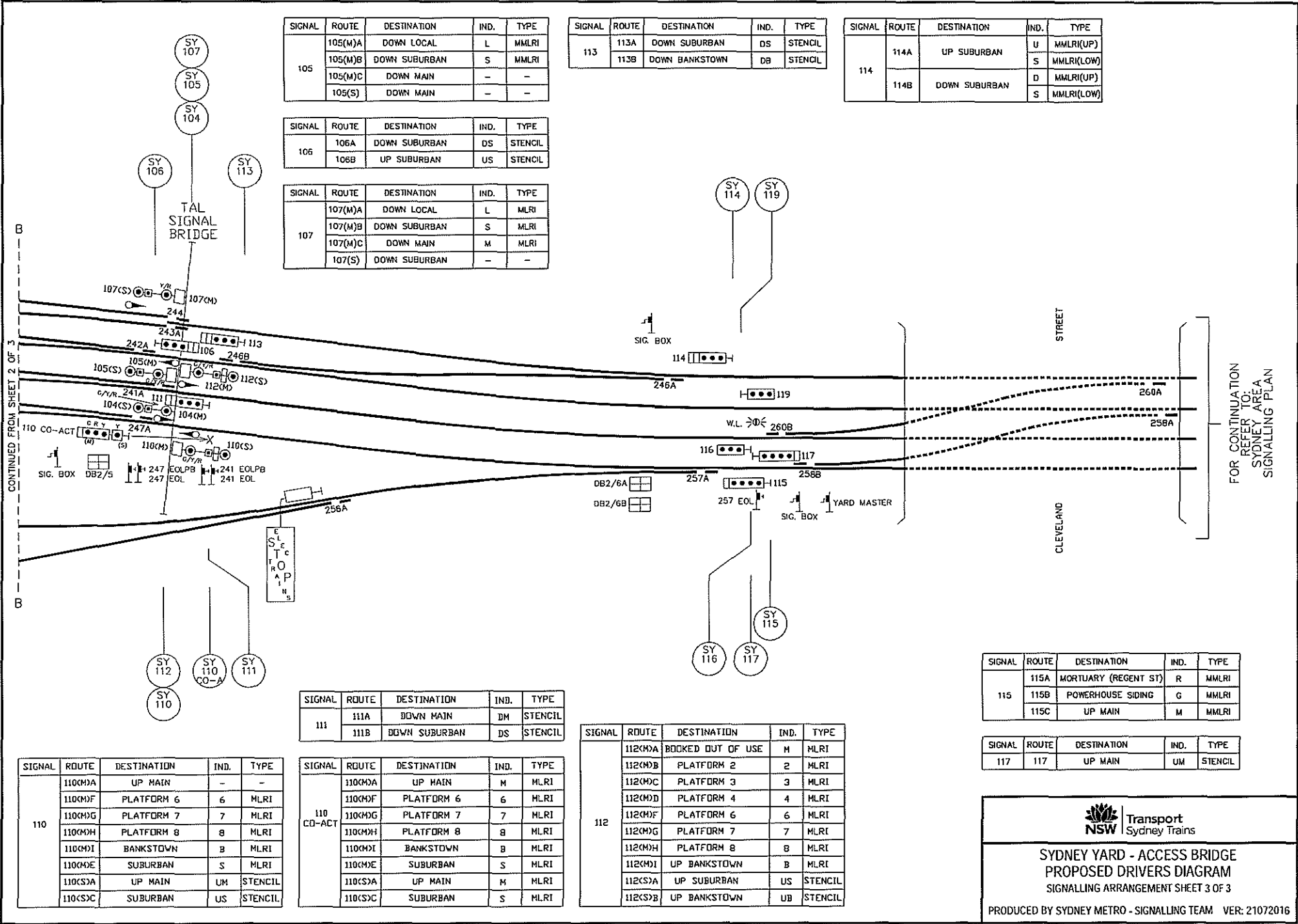
SIGNAL	ROUTE	DESTINATION	IND.	TYPE
101	101A	REGENT ST PLATFORM	RP	STENCIL
	101B	REGENT ST SIDING	RS	STENCIL



SYDNEY YARD - ACCESS BRIDGE
PROPOSED DRIVERS DIAGRAM
 SIGNALLING ARRANGEMENT SHEET 2 OF 3

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 Plotted by: WATTS, STEVE



SIGNAL	ROUTE	DESTINATION	IND.	TYPE
105	105(M)A	DOWN LOCAL	L	MMLRI
	105(M)B	DOWN SUBURBAN	S	MMLRI
	105(M)C	DOWN MAIN	-	-
	105(S)	DOWN MAIN	-	-

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
113	113A	DOWN SUBURBAN	DS	STENCIL
	113B	DOWN BANKSTOWN	DB	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
114	114A	UP SUBURBAN	U	MMLRI(UP)
		S	MMLRI(LOW)	
	114B	DOWN SUBURBAN	D	MMLRI(UP)
		S	MMLRI(LOW)	

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
106	106A	DOWN SUBURBAN	DS	STENCIL
	106B	UP SUBURBAN	US	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
107	107(M)A	DOWN LOCAL	L	MLRI
	107(M)B	DOWN SUBURBAN	S	MLRI
	107(M)C	DOWN MAIN	M	MLRI
	107(S)	DOWN SUBURBAN	-	-

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
111	111A	DOWN MAIN	DM	STENCIL
	111B	DOWN SUBURBAN	DS	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
112	112(M)A	BOOKED OUT OF USE	M	MLRI
	112(M)B	PLATFORM 2	2	MLRI
	112(M)C	PLATFORM 3	3	MLRI
	112(M)D	PLATFORM 4	4	MLRI
	112(M)F	PLATFORM 6	6	MLRI
	112(M)G	PLATFORM 7	7	MLRI
	112(M)H	PLATFORM 8	8	MLRI
	112(M)I	UP BANKSTOWN	B	MLRI
	112(S)A	UP SUBURBAN	US	STENCIL
	112(S)B	UP BANKSTOWN	UB	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
115	115A	MORTUARY (REGENT ST)	R	MMLRI
	115B	POWERHOUSE SIDING	G	MMLRI
	115C	UP MAIN	M	MMLRI

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
117	117	UP MAIN	UM	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
110	110(M)A	UP MAIN	-	-
	110(M)F	PLATFORM 6	6	MLRI
	110(M)G	PLATFORM 7	7	MLRI
	110(M)H	PLATFORM 8	8	MLRI
	110(M)I	BANKSTOWN	B	MLRI
	110(M)E	SUBURBAN	S	MLRI
	110(S)A	UP MAIN	UM	STENCIL
	110(S)C	SUBURBAN	US	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
110 CO-ACT	110(M)A	UP MAIN	M	MLRI
	110(M)F	PLATFORM 6	6	MLRI
	110(M)G	PLATFORM 7	7	MLRI
	110(M)H	PLATFORM 8	8	MLRI
	110(M)I	BANKSTOWN	B	MLRI
	110(M)E	SUBURBAN	S	MLRI
	110(S)A	UP MAIN	M	MLRI
	110(S)C	SUBURBAN	S	MLRI


SYDNEY YARD - ACCESS BRIDGE
PROPOSED DRIVERS DIAGRAM
 SIGNALLING ARRANGEMENT SHEET 3 OF 3
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Appendix B

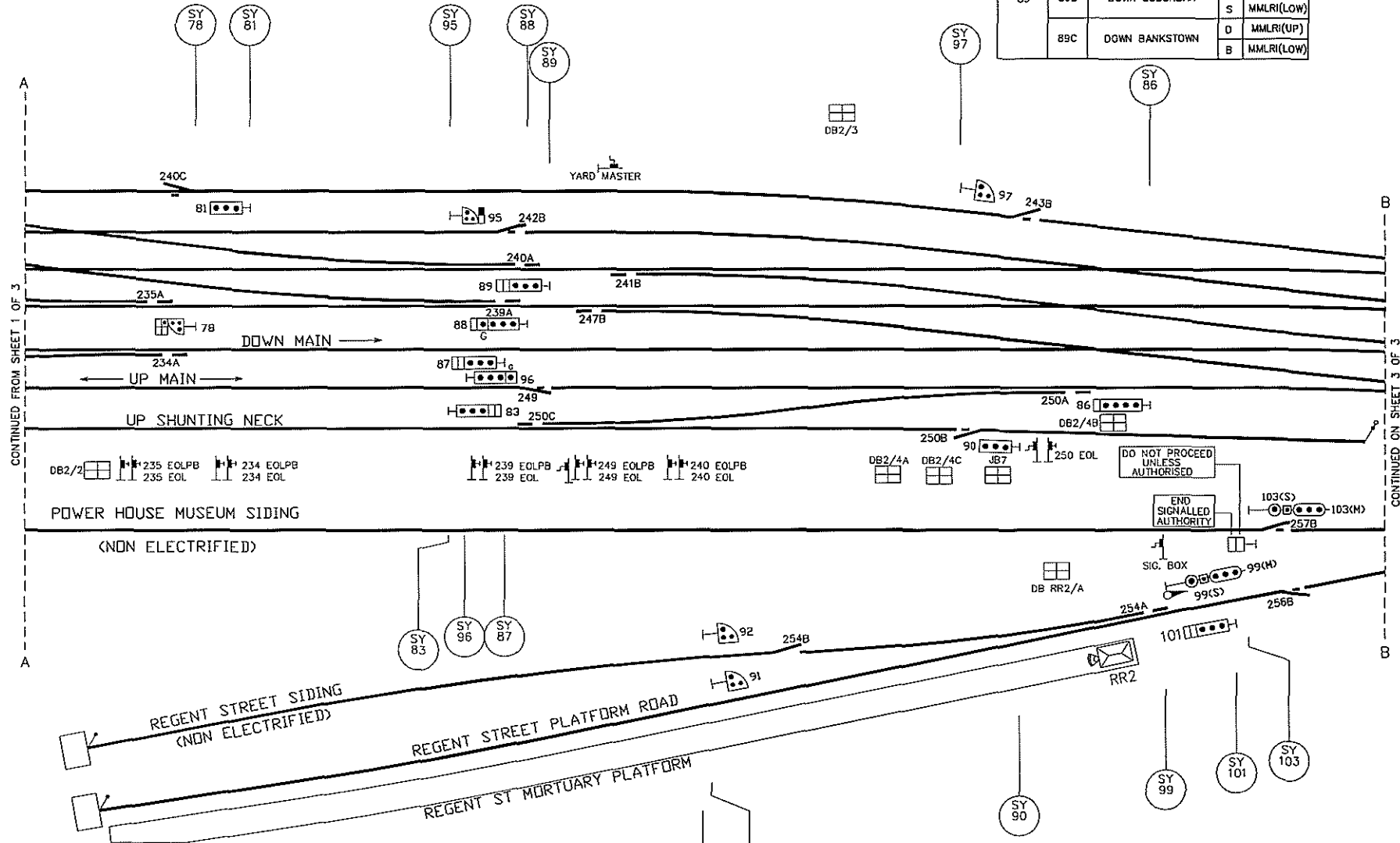
Proposed Signalling Arrangement

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
78	78A	UP SUBURBAN	US	STENCIL
	78B	DOWN SUBURBAN	DS	STENCIL
	78X	DOWN MAIN	DM	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
83	83A	UP MAIN	UM	STENCIL
	83B	SHUNTING NECK	SN	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
86	86A	SHUNTING NECK	N	MMLRI
	86B	UP MAIN	M	MMLRI

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
89	89A	OUT OF USE	U	MMLRI(UP)
			S	MMLRI(LOW)
	89B	DOWN SUBURBAN	D	MMLRI(UP)
			S	MMLRI(LOW)
89C		DOWN BANKSTOWN	D	MMLRI(UP)
			B	MMLRI(LOW)



SIGNAL	ROUTE	DESTINATION	IND.	TYPE
88	88A	OUT OF USE	-	MMLRI
	88B	OUT OF USE	-	MMLRI
	88C	OUT OF USE	-	MMLRI
	88D	UP SUBURBAN	S	MMLRI
	88E	UP BANKSTOWN	B	MMLRI

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
87	87A	OUT OF USE	C	MMLRI(UP)
			S	MMLRI(LOW)
	87B	UP MAIN	U	MMLRI(UP)
			M	MMLRI(LOW)
87C		DOWN MAIN	D	MMLRI(UP)
			M	MMLRI(LOW)

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
101	101A	REGENT ST PLATFORM	RP	STENCIL
	101B	REGENT ST SIDING	RS	STENCIL



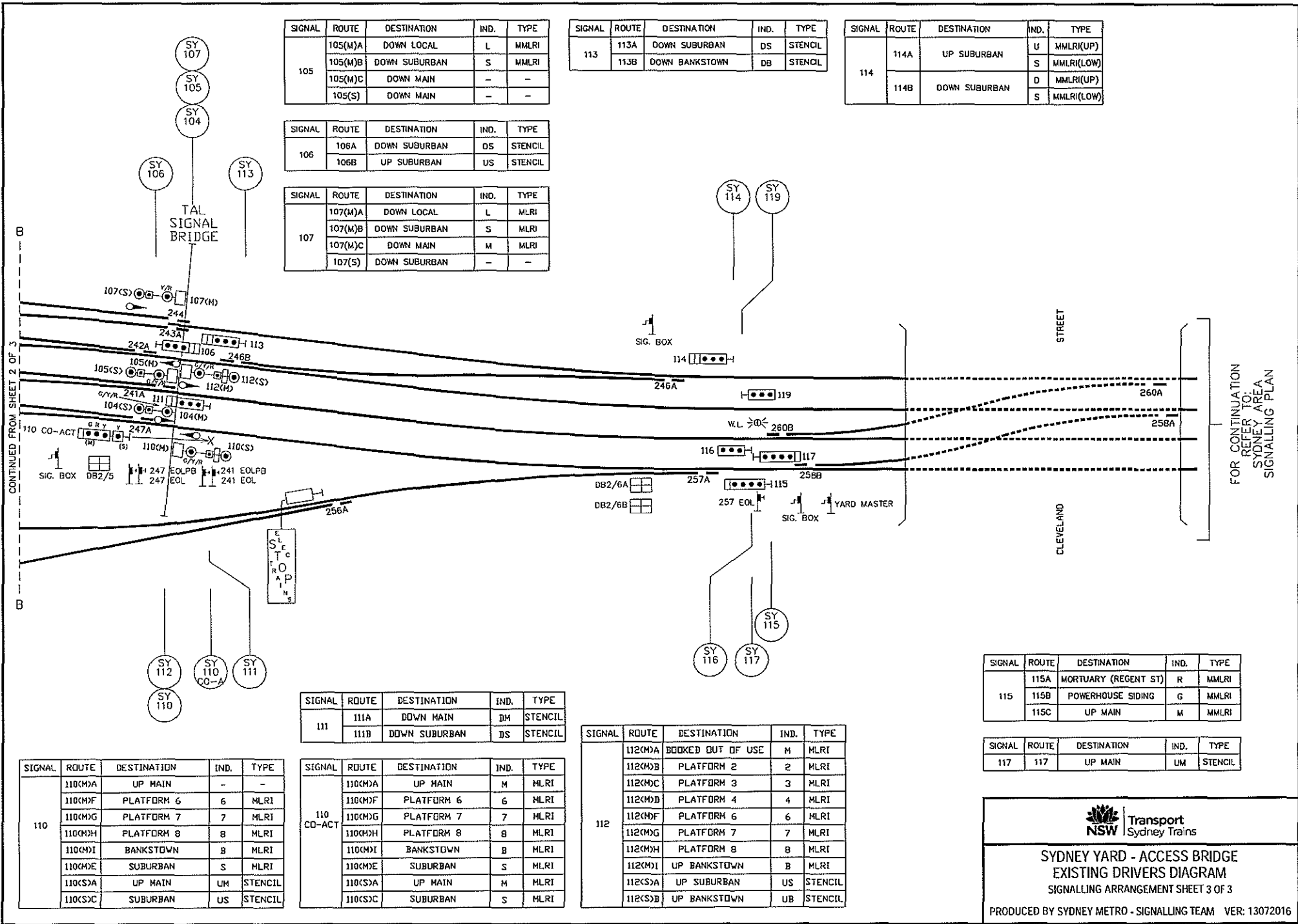
SYDNEY YARD - ACCESS BRIDGE
EXISTING DRIVERS DIAGRAM
 SIGNALLING ARRANGEMENT SHEET 2 OF 3

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CONTINUED ON SHEET 3 OF 3

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SIGNAL	ROUTE	DESTINATION	IND.	TYPE
105	105(M)A	DOWN LOCAL	L	MMLRI
	105(M)B	DOWN SUBURBAN	S	MMLRI
	105(M)C	DOWN MAIN	-	-
	105(S)	DOWN MAIN	-	-

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
113	113A	DOWN SUBURBAN	DS	STENCIL
	113B	DOWN BANKSTOWN	DB	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
114	114A	UP SUBURBAN	U	MMLRI(UP)
		S	MMLRI(LOW)	
	114B	DOWN SUBURBAN	D	MMLRI(UP)
		S	MMLRI(LOW)	

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
106	106A	DOWN SUBURBAN	DS	STENCIL
	106B	UP SUBURBAN	US	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
107	107(M)A	DOWN LOCAL	L	MLRI
	107(M)B	DOWN SUBURBAN	S	MLRI
	107(M)C	DOWN MAIN	M	MLRI
	107(S)	DOWN SUBURBAN	-	-

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
111	111A	DOWN MAIN	DM	STENCIL
	111B	DOWN SUBURBAN	DS	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
110 CO-ACT	110(M)A	UP MAIN	M	MLRI
	110(M)F	PLATFORM 6	6	MLRI
	110(M)G	PLATFORM 7	7	MLRI
	110(M)H	PLATFORM 8	8	MLRI
	110(M)I	BANKSTOWN	B	MLRI
	110(M)E	SUBURBAN	S	MLRI
	110(S)A	UP MAIN	M	MLRI
	110(S)C	SUBURBAN	S	MLRI
	110(S)A	UP MAIN	M	MLRI
	110(S)C	SUBURBAN	S	MLRI

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
112	112(M)A	BOOKED OUT OF USE	M	MLRI
	112(M)B	PLATFORM 2	2	MLRI
	112(M)C	PLATFORM 3	3	MLRI
	112(M)D	PLATFORM 4	4	MLRI
	112(M)F	PLATFORM 6	6	MLRI
	112(M)G	PLATFORM 7	7	MLRI
	112(M)H	PLATFORM 8	8	MLRI
	112(M)I	UP BANKSTOWN	B	MLRI
	112(S)A	UP SUBURBAN	US	STENCIL
	112(S)B	UP BANKSTOWN	UB	STENCIL

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
115	115A	MORTUARY (REGENT ST)	R	MMLRI
	115B	POWERHOUSE SIDING	G	MMLRI
	115C	UP MAIN	M	MMLRI

SIGNAL	ROUTE	DESTINATION	IND.	TYPE
117	117	UP MAIN	UM	STENCIL



SYDNEY YARD - ACCESS BRIDGE
EXISTING DRIVERS DIAGRAM
 SIGNALLING ARRANGEMENT SHEET 3 OF 3

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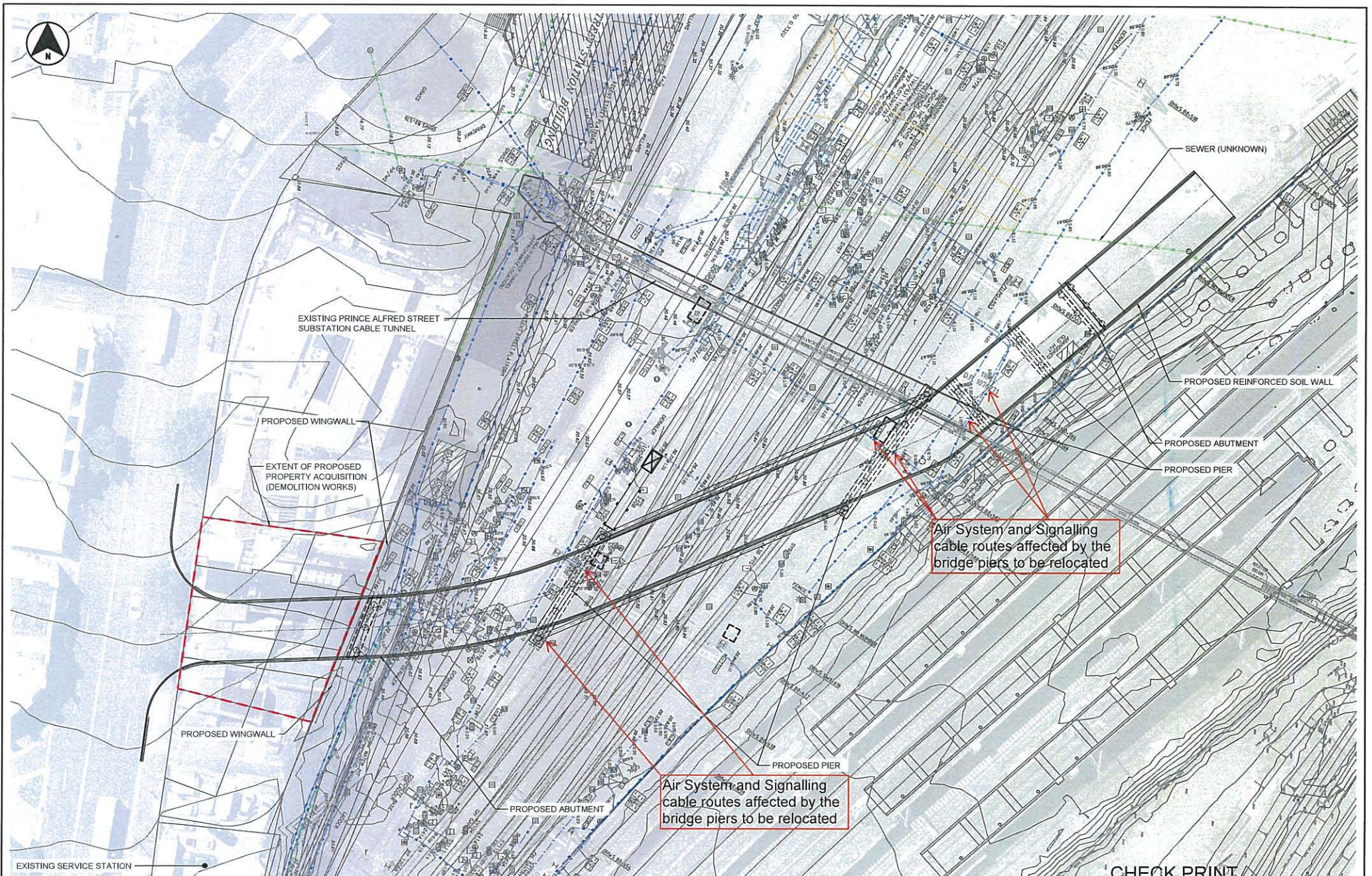
FOR CONTINUATION REFER TO: SYDNEY AREA SIGNALLING PLAN

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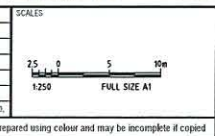
Appendix C

Proposed Access Bridge

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REVISION IN PROGRESS			
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CENTRAL STATION	
SYDNEY YARD ACCESS BRIDGE	
PLAN	
EXISTING SERVICES	
STATUS: SKETCH - FOR INFORMATION ONLY SHEET 1 OF 1	
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NOTE: Do not scale from this drawing.

Appendix 5 Asset Management



Sydney Metro City & Southwest

Sydney Yard Access Bridge Project Contract Schedules

Schedule C1

Scope of Works and Technical Criteria
Appendix 5
Asset Management

PROJECT	Sydney Metro City & Southwest	DATE	31 August 2016
GROUP	Sydney Metro City & Southwest	STATUS	FINAL
AUTHOR	Transport for NSW	REVISION	
COMPANY	Transport for NSW	FILE NUMBER	
FILE NAME	SYAB SWTC Appendix 5 (20160831Final)		

Contents

1	AMI Delivery Plan	1
2	AMI Submission	2
3	AMI Format	3
3.1	General	3
3.2	AMI Requirements for Non-Rail Network Related Assets	3
3.3	Document Numbering	3
3.4	Document Revision Numbering	3
3.5	Document Identification	4
3.6	Document File Types	4
3.7	Document File Sizes	5
3.8	Hard Copy Format	5
3.9	Document Transmittals	5
3.10	Validation of Content	6
3.11	AMI Content for Rail Network Related Assets	6
3.12	Project Description and Scope of the Works	7
3.13	Schedule of Contact Details	8
3.14	Asset Registers	8
3.14.2	EXISTING SYDNEY TRAINS ASSET REGISTERS TO BE UPDATED	8
3.15	Operation and Maintenance Manuals General	9
3.16	Schedule of Finishes	14
3.17	Warranties and Guarantees	14
3.18	Technical Description & Operating Guides General	14
3.19	Operating Guide and Supplier Manuals	15
3.20	Compliance Certificates and Records	15
3.21	Technical Maintenance Plans	16
3.22	Spares Schedule	16
3.23	Training Materials	17
3.24	Work-As-Executed Design Documentation	17
3.25	Test certificates	19
3.26	Special Tools, Facilities and Equipment	19
3.27	Training Materials	19
3.28	List of Reference Documents	19

1 AMI Delivery Plan

- (a) The Contractor must prepare and implement an "AMI Delivery Plan" which must identify how the Contractor will comply with the Asset Management Information requirements of the Contract, including this Appendix.
- (b) The AMI Delivery Plan must be prepared and initially submitted to the Principal's Representative within 20 Business Days of the date of the Contract.
- (c) The Contractor must undertake the ongoing development, amendment and updating of the AMI Delivery Plan throughout the duration of the Contractor's Activities including to take into account Asset Management Information not covered by the existing AMI Delivery Plan.
- (d) The AMI Delivery Plan must address and detail, as a minimum:
 - (i) the Asset Management Information management team structure, including key personnel, authority and roles of key personnel, lines of responsibility and communication, minimum skill levels of each role and interfaces with the overall project organisation structures;
 - (ii) processes and procedures for producing and collecting Asset Management Information;
 - (iii) processes and procedures for the submission of Asset Management Information to the Principal's Representative and for the further development and updating of Asset Management Information;
 - (iv) a schedule of all of the Contractor's Asset Management Information deliverables and submission timeframes, including documents to be provided by Subcontractors;
 - (v) the key elements of the Works that will be addressed in individual operation and maintenance manuals, and operating guides;
 - (vi) processes and procedures for the development of a work-as-executed version;
 - (vii) relationships between each part of the Asset Management Information.

2 AMI Submission

- (a) Asset Management Information submissions must be structured and scheduled to facilitate efficient asset handover to Asset Owner, Maintainer and Operator.
- (b) The initial draft, final draft and final Asset Management Information must be validated and verified in terms of accuracy and compliance with the requirements of this Appendix by the Contractor prior to submission to the Principal's Representative
- (c) The Principal's Representative may (but is not obliged to) provide the Contractor with comments on the AMI.
- (d) The Contractor must review and act on any comments made by the Principal's Representative on, and correct all deficiencies in, the staged submission of the AMI.

3 AMI Format

3.1 General

- (a) The Contractor must submit all AMI documentation in both digital form (as individual computer files) and in hard copy.

3.2 AMI Requirements for Non-Rail Network Related Assets

- (a) For non-rail network related assets the Contractor must consult the owners of non-rail assets to determine the relevant owner's requirements for Asset Management Information.
- (b) The Contractor must comply with the Asset Management Information requirements of those owners, and the requirements set out in this section in relation to the non-rail network related assets.
- (c) As a minimum, the AMI content provided for each asset owner must include:
 - (i) the Works specific to the non-rail network related assets description;
 - (ii) schedule of contact details;
 - (iii) manufacturer's manuals, brochures and spares parts list;
 - (iv) schedule of finishes;
 - (v) warranties and guarantees;
 - (vi) compliance certificates, testing and commissioning records, including a register of the same; and
 - (vii) Work-as-Executed Design Documentation including design drawings, shop drawings, survey drawings, photographic records and technical reports, specifications, plans and schedules.
- (d) The Contractor must also update any existing asset registers in use by the asset owners for non-rail network related assets.

3.3 Document Numbering

- (a) The Contractor must produce a coherent system of document numbering for the AMI as appropriate to its content. The numbering system must be approved by Principal's Representative and is in accordance with Sydney Trains and ASA Standards.

3.4 Document Revision Numbering

- (a) Revision numbers for draft versions (e.g. Design Documents, AFC) of documents must be A, B, C, etc.
- (b) Revision numbers for final (Work-As-Executed) versions of documents must be numerical.

3.5 Document Identification

- (a) Asset Management Information must, as a minimum, be identified in the following ways:
 - (i) by the document number and revision number in the electronic file name, separated by a unique divider (e.g. "-" or ".") that is not used elsewhere in the file name;
 - (ii) by the document number and a fully descriptive title on the front page of the document; and
 - (iii) by the above document number and revision number on all pages of the document.
- (b) Where large numbers of documents (more than 100) are delivered on one subject (e.g. certificates and concrete records), a separate document providing an index to these documents must be provided.

3.6 Document File Types

- (a) The Contractor must:
 - (i) submit the documents in an acceptable format for the document type. Acceptable electronic formats are Microstation/AutoCAD CAD files, TIF format image files, JPG format photographs, Microsoft Excel spreadsheets, Microsoft Word word processing files, Microsoft PowerPoint presentation files, Microsoft Access relational data base files and Adobe Acrobat portable document format (PDF);
 - (ii) submit drawings in the format required by Sydney Trains and ASA Standards;
 - (iii) submit the native 'updateable' files for requested documents, as part of the final AMI, including:
 - (iv) drawings (including Work-As-Executed drawings);
 - (v) Technical Maintenance Plans;
 - (vi) Asset Registers and Equipment Registers;
 - (vii) Service Schedules;
 - (viii) failure modes, effects, and criticality analysis ("FMECA") and/or reliability availability maintainability and safety ("RAMS") calculations;
 - (ix) O&M Manuals;
 - (x) equipment software and configuration files (including software programs necessary to access such files);
 - (xi) training program; and
 - (xii) forms required for maintenance activities; and
- (b) include all required data within the designated file (whether view file or native file). Links between files are not acceptable as these links are not always transferable to other document management systems.

3.7 Document File Sizes

- (a) Document files must not exceed 10MB in size. Individual files can be compressed (zipped) to achieve this size.
- (b) Where documents exceed 10MB they must be divided into sub-documents and sequentially numbered (e.g. "001", "002", "003").

3.8 Hard Copy Format

- (a) For any hard copy format documents, the Contractor must:
 - (i) bind or contain each hard copy of the Asset Management Information in white, durable, three ring hard cover binders, not greater than 70mm thick, with the asset identification permanently marked on the spine and outside cover with clear protection on the covers;
 - (ii) where multiple binders are utilised, include a complete table of contents for the entire Asset Management Information in each binder, clearly indicating which sections are located in each folder. The cover page for each binder must be inserted as the first page within each folder, and a copy inserted into the front cover of the folder;
 - (iii) limit filling of binders to 60% of binder capacity;
 - (iv) divide sections with indexed plastic divider sheets and index the contents;
 - (v) protect vulnerable and much used pages with plastic covers;
 - (vi) print drawings in colour on A3 size paper. Where drawings are not legible on A3 size paper, drawings are to be printed in colour on their original size paper;
 - (vii) print text on A4 size paper on one side only, in a clear typeface with a 35mm margin for binding;
 - (viii) where diagrams forming part of the Asset Management Information are larger than A4 size, print the diagrams on A3 size paper and fan fold them to align to A4 size; and
 - (ix) print illustrations on A3 size paper folded to A4 size and located at the rear of the text, but small illustrations, to highlight matters, may be located in the text.

3.9 Document Transmittals

- (a) The Contractor must:
 - (i) identify in the instrument of transmittal, as a minimum, a unique transmittal identifier, a description of the content of the documentation supplied, the date of transmission and the sender;
 - (ii) adhere to any standard transmittal formats supplied by the Principal's Representative;

- (iii) deliver Asset Management Information documents using an acceptable electronic medium for data exchange. Unless otherwise agreed with the Principal's Representative, acceptable electronic media are CD and DVD disks formatted to suit Microsoft Windows based PC computers and any web based document management system adopted by the Principal. The use of electronic mail (email) to deliver Asset Management Information documents is not acceptable;
 - (iv) transmit CAD files in accordance with the requirements of the Principal's Representative; and
 - (v) deliver two copies of any CD/DVD and one original and two copies (one of which is unbound) of any hardcopy documents
- (b) The document transmittals must, as a minimum, provide the following metadata for each document:
- (i) document number;
 - (ii) revision number;
 - (iii) full document title / description matching that written in the document front page; and
 - (iv) document type (e.g. manual, drawing, certificate, etc.) .
- (c) The Contractor must identify each Asset Management Information document submitted with appropriate metadata as defined by the Principal's Representative.
- (d) The metadata for each document must be provided on document transmittals. A Microsoft Excel formatted electronic copy of the transmittal template will be provided by the Principal's Representative upon request by the Contractor.

3.10 Validation of Content

- (a) The AMI documentation provided must be validated by the Contractor prior to any staged handover, commissioning and Completion of the Works, in sufficient time for it to be used as part of the training provided by the Contractor.
- (b) The Contractor must submit to the Principal's Representative the proposed process and program for validation of documents to be provided under this contract.

3.11 AMI Content for Rail Network Related Assets

- (a) For rail network related assets, the AMI must include the following documentation:
 - (i) a project description and a description of the scope of the Works delivered for the Sydney Yard Access Bridge Project ("Project Description");
 - (ii) a schedule of the contact details for all the Contractor's designers and Subcontractors involved in the design, construction, certification and commissioning of the Works ("Schedule of contract Details");
 - (iii) an Asset Register of the individual assets created for the Works (the "Asset Register");

- (iv) Operation and Maintenance Manuals providing a description of the location, functions performed, and operating instructions for all assets forming the Works (the "Operation and Maintenance Manuals");
- (v) a "Schedule of Finishes" containing the finishing materials installed on assets forming the Works for Sydney Yard Access Bridge Project (the "Works"), with descriptive details, location, manufacturer, colour, cleaning instructions, warranties, maintenance requirements and contacts for supply/repairs (the "Schedule of Finishes");
- (vi) all warranties and guarantees;
- (vii) detailed technical descriptions of all of the assets forming the Works which is aimed at the operators and maintainers of these assets (the "Technical Descriptions");
- (viii) detailed technical descriptions of each operating system, the function of the system, and day to day operating instructions for operators and maintainers of these systems (the "Operating Guides");
- (ix) construction, testing and commissioning compliance certificates and records, including a register of the same;
- (x) comprehensive technical maintenance plans for all of the assets forming the Works which is aimed at the operators and maintainers of these assets (the "Technical Maintenance Plans")
- (xi) Work-As-Executed design documentation including design drawings, shop drawings, survey drawings, photographic records and technical reports, specifications, plans and schedules;
- (xii) a schedule of spare parts or components for the assets forming the Works that it is recommended the operator and maintainer should keep in stock (the "Spares Schedule");
- (xiii) a schedule of special tools, facilities and equipment necessary for the operation and maintenance of the assets forming the Works for Sydney Yard Access Bridge Project (the "Schedule of Special Tools, Facilities and Equipment");
- (xiv) training materials.

3.12 Project Description and Scope of the Works

- (a) The Project Description must contain:
 - (i) an outline of the scope of the Works;
 - (ii) details of the major stakeholders;
 - (iii) datelines;
 - (iv) any new or altered services or systems included; and
 - (v) any other relevant information.
- (b) Where the Works adjoin any existing assets, these assets must be clearly identified as not forming part of the Works.

3.13 Schedule of Contact Details

- (a) The Schedule of contract Details must provide contact details for all Subcontractors, including the Contractor's designers. Details must include:
 - (i) the names of all designers and the corresponding initials utilised on drawings;
 - (ii) the correct name of the organisation, including the ABN number;
 - (iii) the role of the organisation under the contract;
 - (iv) address, telephone and fax numbers for the organisation;
 - (v) primary contact name within the organisation for enquiries relating to the Works; and
 - (vi) website address of the organisation (if any).

3.14 Asset Registers

- (a) The Contractor must develop and implement a comprehensive data collection system for all asset components ("Asset Register"), which includes a digital copy in an acceptable relational database format. The information included in the Asset Register must, as a minimum, include all the information shown in the TfNSW ASA Standard T MU AM 02001 ST "Asset Information and Register Requirements".
- (b) The Asset Register must provide details of all assets provided as part of the Works other than architectural floor, wall and ceiling finishes which must be included in the Schedule of Finishes prepared by the Contractor.
- (c) The Asset Register must be divided into groups containing items that are commonly grouped together. For example, electrical distribution boards, light fittings, lifts and escalators, plumbing fittings, public address system, fire detection equipment, fire suppression equipment. There must be an index to the groups in the front of the Asset Register.
- (d) Asset Registers must include information on:
 - (i) new assets to be created;
 - (ii) existing assets to be updated (i.e. assets being modified); and
 - (iii) existing assets to be deleted (i.e. assets being decommissioned).

3.14.2 EXISTING SYDNEY TRAINS ASSET REGISTERS TO BE UPDATED

- (a) The Contractor must provide information relating to assets provided as part of the Works utilising an appropriate hierarchical numbering system which will enable the Asset Owner and the Operator/Maintainer to update the following existing Asset Registers as a minimum:
 - (i) the asset held within the "Ellipse" register must be prepared in accordance with the Sydney Trains' Ellipse Naming Conventions in an electronic format that is acceptable to the Principal's Representative.;
 - (ii) "SmartData" database which describe the location and characteristics of:

- (iii) in-situ rail welds - SmartWeld; and
 - (iv) overhead wiring - SmartWire;
 - (v) "TrackData" software; and
 - (vi) Geographical Information System (GIS), which describe the location and characteristics of all of Asset Operator and Maintainer's infrastructure assets.
- (b) The Contractor must consult with Sydney Trains with regards to their requirements. As a minimum, the Contractors will deliver requirements set in Sydney Trains guidelines in Section 1.3.28 of this document.
- (c) The Asset Owner / Operator and Maintainer have developed templates and guidelines for uploading data into the asset registers and data requirements for GIS described above. These are available upon requests from the Principal's Representative.

3.15 Operation and Maintenance Manuals General

- (a) As a minimum, the Contractor must provide an "Operation and Maintenance Manual" or "O&M Manual" for every key element of the Works as outlined in the AMI Delivery Plan.
- (b) Operation and Maintenance Manuals must be written from the perspective of the operator or maintainer looking to locate and identify the operation and maintenance requirements of a 'single system'. In the electronic documentation environment, the Operation and Maintenance Manual must provide a central document that provides cross references to all other relevant documentation for the system. Operation and Maintenance Manuals must be written in clear concise English and in the present tense.
- (c) O&M Manual Scope & Structure
- (i) The Contractor must prepare each Operation and Maintenance Manual using the standard format as detailed in Table 1 this Appendix. No section of this standard format is to be omitted. Where a section is not applicable to a particular asset, the words 'Not Applicable' or similar must be included under the section heading.
 - (ii) Detailed operation and maintenance information can be provided in other documents provided that these documents comply with the requirements of this Appendix and are fully cross referenced in the Operation and Maintenance Manual.
 - (iii) Where references to other documents are included in the Operation and Maintenance Manual, the reference must include the reference document number and the location within that document where the relevant information can be found.
 - (iv) Figures and pictures must be included in the Operation and Maintenance Manuals where this is appropriate. For example, figures and pictures must be used to:
 - A. present information which is difficult to describe by text alone; and

- B. provide identification of tools, parts and other such items.
- (v) Halftone figures (photographs), where used, must be suitable for electronic scanning and photocopying without loss of detail.

Table 1 Operation and Maintenance Manual Standard Format

Reference	Description
General	<p>Front Cover</p> <p>The front cover of the Operation and Maintenance Manual must contain:</p> <ul style="list-style-type: none"> • The Transport for NSW logo; • The project name; • The document description consisting of the key element description (e.g. asset type or discipline) and the words "Operation and Maintenance Manual"; and • The document number.
General	<p>Page Headers</p> <p>The page headers of the Operation and Maintenance Manual must contain the project name and the document description.</p>
General	<p>Page Footers</p> <p>The page footers of the Operation and Maintenance Manual must contain:</p> <ul style="list-style-type: none"> • The document number and revision number; and • Page numbers in the format "Page x of y". Page numbers must be continuous throughout the document and not reset at section breaks.
General	<p>Revision History</p> <p>The revision history of the Operation and Maintenance Manual must be included in a "Revision Control Table" at the start of the manual. The revision control table must provide, for each revision:</p> <ul style="list-style-type: none"> • Revision letter or number with no decimal places; • Date of revision; and • Summary of change(s) in comparison to the previous version.
General	<p>Glossary of Terms</p> <p>A glossary of terms for each Operation and Maintenance Manual must be included at the start of the manual, including all acronyms and technical terms listed in the manual.</p>
General	<p>Table of Contents</p> <p>A table of contents, listing sections and sub-sections of the Operation and Maintenance Manual.</p>
Section 1	<p>Purpose of the Operation and Maintenance Manual</p> <ul style="list-style-type: none"> • Brief description of the Operation and Maintenance Manual's purpose, structure and content; • Identification of asset owner, Contractor, Subcontractors and other involved parties; and • Tabulation of Subcontractors and utilities/service providers, together with

Reference	Description
	contact details for each significant element of the assets.
Section 2	<p>Description of the System</p> <ul style="list-style-type: none"> • An overview of sufficient detail to provide the reader with immediate understanding of the whole of the system; • A location plan / diagram with introductory text to identify the main components of the system and the interfaces; and • Detailed description of each of the elements of the assets covered by the Operation and Maintenance Manual to complement the location plan, including all equipment, components, systems and items, with a tabulation of dimensions, performance ratings, and asset number, information and attributes.
Section 3	<p>System Interfaces</p> <ul style="list-style-type: none"> • Details of all systems with which this system interfaces; • Description of how these interfaces operate (i.e. how this system works with / impacts on the other systems); • Impacts of system failures either by this system or by other systems, impacting on this system; • Summary diagrams of the various utilities and services including communication services, electrical services, drainage, fire services, water treatment and utilities, gas, sewer, stormwater and water; and • References of where further information for the interfacing systems can be found.
Section 4	<p>Detailed Technical Description and Operating Guides</p> <ul style="list-style-type: none"> • Detailed Technical Descriptions of the asset, aimed at the operators and maintainers, and covering each element of the system, including all equipment, components, systems and items; and • Detailed Operating Guides.
Section 5	<p>Safety and Environment</p> <ul style="list-style-type: none"> • Consolidation of all relevant safety issues associated with the system (may be duplicating content of supplier/manufacture manuals located elsewhere in the manual), noting all hazards and highlighting specific risks; • A tabulation or listing of emergency contact organisations, personnel or positions, phone/fax numbers and operational procedures relating to emergencies; and • Suppliers' material safety data sheets to be provided.
Section 6	<p>FMECA/RAMS</p> <ul style="list-style-type: none"> • Statement of whether FMECA was carried out (refer to TfNSW Manual T MU AM 01002 MA T MU Maintenance Requirements Analysis Manual). Explanation of the basis for original design and equipment selected for installation (e.g. performance requirements); and • Statement of whether RAMS was carried out (out (refer to TfNSW Manual T MU AM 01002 MA T MU Maintenance Requirements Analysis Manual).

Reference	Description
	Reports are to include actual calculations.
Section 7	Asset Register <ul style="list-style-type: none"> • Comprehensive Asset Register including system details.
Section 8	Spares <ul style="list-style-type: none"> • Detail the methodology used to develop the Spares Schedule (refer to TfNSW standard T MU AM 01010 ST “Framework for Developing an Asset Spares Assessment and Strategy”) and the operating period addressed by the spares and include details of: • The level at which spares are to be held (e.g. component, assembly, sub-system or system level); • Expected failure rates; • Maintenance policies that the spares selection is based on; • Expected procurement lead time; • Ongoing availability of spares; • Storage requirements, including storage environmental constraints such as temperature and humidity; and • A sub-section on Spares Schedule, divided into “General Spares” and “Insurance Spares” categories.
Section 9	Maintenance <ul style="list-style-type: none"> • Comprehensive step by step instructions in preventative and corrective maintenance procedures, nominating the work to be carried out by qualified tradespersons and others, and the designated service periods, such as weekly, monthly, quarterly, semi-annually, annually; • Relevant maintenance standards; • Maintenance instructions for each of the service periods subdivided into the following categories: unit running, unit stopped; • Location of maintenance action (on-system, in workshop, etc.); • Consumables and special tools required; • List of recommended greases and oils, stating quantities, methods and frequency for application; • Troubleshooting instructions in tabular form listing “fault”, “possible cause” and “remedial action”, with testing regimes and instructions; • A sub-section on “Schedule of Special Tools, Facilities and Equipment”; and • A sub-section on “Schedule of Finishes” containing the finishing materials installed with descriptive details, location, manufacturer, colour, cleaning instructions, warranties, maintenance requirements and contacts for supply/repairs
Section 10	Training Program <ul style="list-style-type: none"> • A program of appropriate training for operation and maintenance personnel; • Train the trainer style manuals appropriate to the personnel associated with

Reference	Description
	<p>the operation and maintenance of the system; and</p> <ul style="list-style-type: none"> • If the training information included in the Operating Guides or suppliers'/manufacturers' manuals does not meet the requirement, then additional information is required.
Section 11	<p>Installation, Commissioning & Overhauling</p> <ul style="list-style-type: none"> • Details of standards and procedures for mounting or erecting, wiring or setting up, and commissioning equipment; • All testing and commissioning certificates and all associated commissioning and test results issued in respect of the Works for the system/sub-system and equipment; • System configuration information, including protection settings for electrical equipment; and • Unless otherwise contained in the Technical Maintenance Plans or Service Schedules, step by step instructions and procedures for complete overhauls, indicating those procedures to be carried out by qualified tradespersons, described under at least the following subheadings: <ul style="list-style-type: none"> • Dismantling; • Cleaning, inspection, repair and adjustment; • Reassembly; and • Final checks and unit running.
Section 12	<p>Manufacturer's/Supplier's Operation and Maintenance Manuals, Warranties and Compliance Certificates</p> <ul style="list-style-type: none"> • Manufacturer's operation and maintenance manuals (can be embedded in the Operation and Maintenance Manual or delivered as a separate referenced document); • Relevant warranties and guarantees; and • Compliance certificates as required for the Assets.
Section 13	<p>Other Information</p> <ul style="list-style-type: none"> • Any relevant information not specifically covered in the previous sections:
Section 14	<p>Document Reference List</p> <ul style="list-style-type: none"> • A reference list of all documents and drawings referred to in the body of the Operation and Maintenance Manual as well as those not specifically referenced but which are required to complete the documentation related to the asset. • References must be listed in order of type and document number, and provide the title of each document. • Examples of contents are: <ul style="list-style-type: none"> – Calculations; – Construction, testing and commissioning records; – Drawings; – Quality forms and records used during construction of the Works;

Reference	Description
	<ul style="list-style-type: none">- Software;- Technical specifications and reports;

3.16 Schedule of Finishes

- (a) The Schedule of Finishes in the Operation and Maintenance Manuals must include the following data for all internal and external architectural materials and finishes on the Works:
- (i) description or name of material or finish;
 - (ii) thickness/weight/gauge;
 - (iii) profile or size;
 - (iv) colour/finish details;
 - (v) manufacturer or supplier;
 - (vi) cleaning and maintenance recommendations; and
 - (vii) locations used.
- (b) Colours may be scheduled in a separate colour schedule.
- (c) A location schedule must be included so that the details of materials and finishes in each room or space or building component can be located on the Schedule of Finishes.

3.17 Warranties and Guarantees

- (a) All warranties and guarantees associated with the Project Works must be provided in the Operation and Maintenance Manuals and must be arranged in a logical sequence and include an index.

3.18 Technical Description & Operating Guides General

The Technical Descriptions in the Operation and Maintenance Manuals must include:

- (a) a short description of all assets, even if it is a proprietary item, with relevant technical tables, a table of dimensions, performance ratings;
- (b) operating guidelines, procedures and principles for all of the assets;
- (c) a basic working description of all of the assets, including novel features, any automatic control, and the operational purposes and functions of the various components and systems;
- (d) a location plan to identify and locate all of the assets, or a written description if more appropriate;
- (e) details of any utilities critical to the operation of the assets and where necessary the isolation points; and

- (f) for software oriented systems, functional specifications (hardware and software), systems programs, individual program modules, including flow charts and source codes.

3.19 Operating Guide and Supplier Manuals

- (a) The Operating Guides in the Operation and Maintenance Manuals must provide comprehensive details of technical information relevant to all elements of the asset with a step by step procedure which is arranged into sections which relate to, for example:
 - (i) safety procedures;
 - (ii) operating limitations due to temperature, pressure and flow, or other relevant factors;
 - (iii) checks before, and procedures for, equipment start-up, operations and shutdown;
 - (iv) emergency shutdown and abnormal operation;
 - (v) full information on alarm and trip settings;
 - (vi) links to inspection, servicing and maintenance schedules as defined in the Technical Maintenance Plan;
 - (vii) component manuals covering maintenance and repair of all items of installed equipment;
 - (viii) fault finding guides, for use at the operating maintenance level;
 - (ix) illustrated parts catalogues;
 - (x) supply contract details (if applicable);
 - (xi) name of supplier (if applicable);
 - (xii) address for service calls (if applicable); and
 - (xiii) any other information needed by operating staff to ensure the safe and efficient operation of the equipment.
- (b) As a minimum, the Contractor must provide individual Operating Guides for each key element of the Works as identified in the AMI Delivery Plan.
- (c) Manuals and documents provided by suppliers and manufacturers may be used provided that these manuals and documents comply with the requirements of this Appendix and are integrated into the Operation and Maintenance Manuals.

3.20 Compliance Certificates and Records

- (a) All compliance and certification documents associated with the Works must be included in the Operation and Maintenance Manuals and must include the following, where applicable:
 - (i) Building Code of Australia compliance reports and certificates;
 - (ii) Disability Discrimination Act compliance reports and certificates; and

- (iii) fire and life safety compliance reports and certificates.
- (iv) Fall arresting system Certification.
- (v) Operation and Maintenance Manuals must also contain a description of the quality assurance systems utilised by the Contractor and the location of all detailed construction completion and commissioning records, test results, inspection and test plans and other quality assurance data.
- (vi) The Contractor must include the first registration certificate for every asset that requires annual or periodic registration in the Operation and Maintenance Manuals.

3.21 Technical Maintenance Plans

- (a) Technical Maintenance Plans for all assets forming the Works must be included in the Operation and Maintenance Manuals and must include service schedules for these assets (the "Service Schedules"). These must be developed in accordance with TfNSW standard T MU AM 01003 ST "Development of Technical Maintenance Plans".
- (b) The Contractor must provide details and the respective forms of all records that are required for maintenance actions. These must be presented in tabular form in the Operation and Maintenance Manuals. Sample forms are to be delivered as separate documents in native format (e.g. Microsoft Word or Microsoft Excel).

3.22 Spares Schedule

- (a) The Spares Schedule in the Operation and Maintenance Manuals must detail the recommended range and quantity of consumables and the spares required to support the operational and maintenance requirements of the assets forming the Works.
- (b) The Contractor must develop the Spares Schedule using methodology in TfNSW standard T MU AM 01010 ST "Framework for Developing an Asset Spares Assessment and Strategy".
- (c) The Contractor must progressively develop and refine the Spares Schedule while performing the Contractor's Activities to ensure that it fully covers the Works.
- (d) The Spares Schedule must include the following information:
 - (i) item identification (name, manufacturer's part or reference number and specification, as appropriate);
 - (ii) recommended spares quantities;
 - (iii) price expected;
 - (iv) source;
 - (v) procurement lead time;
 - (vi) failure rate;
 - (vii) number of items installed in the Works;

- (viii) predicted usage rate and whether the item is consumable or is used in support of scheduled preventative maintenance;
 - (ix) proposed location of spares; and
 - (x) the probability of the required item being available to suit the recommended spares quantity.
- (e) Data on spare parts is to be supplied under the following headings:
- (i) "List of Suppliers", stating:
 - A. manufacturer, including ABN number;
 - B. manufacturer's nearest representative;
 - C. company address;
 - D. telephone and fax numbers; and
 - E. website;
 - (ii) "Illustrated Parts List", including a list (or lists) of parts with part numbers referenced to an illustration, preferably an exploded view of a sectional drawing and a specification;
 - (iii) "Recommended Spare Parts", including a list of recommended spare parts with part numbers and quantities, and highlighting critical spares (to be held at all times);
 - (iv) "Availability of Spare Parts", including a short statement quoting the worst case procurement lead time/availability to suit the quantities of parts from suppliers; and
 - (v) "Ordering Information" including specific details that would be required when ordering replacement parts, such as serial number, model number, name and reference number.

3.23 Training Materials

- (a) All relevant training aids and materials required to provide training for the operators and maintainers of the Works must be included in the Operation and Maintenance Manuals

3.24 Work-As-Executed Design Documentation

- (a) The Contractor must:
 - (i) submit sample Work-As-Executed Design Documentation for all assets for review and acceptance by the Principal's Representative prior to production of any Work-As -Executed Design Documentation;
 - (ii) show on Work-As-Executed Design Documentation the details of the locations of existing infrastructure within the Construction Site and the location and extent of the Works completed by the Contractor;

- (iii) update the approved for construction Design Documentation to produce the Work-As-Executed Design Documentation and other drawings as necessary to fully describe the Works.
- (iv) Work-As-Executed Design Documentation for any building components of the Works must include all drawings produced for the building component of the Works, including but not limited to design drawings, shop drawings and drawings produced by specialist trades (for example, combined services layouts, structural electrical and mechanical drawings, and equipment installation drawings);
- (v) ensure the content, accuracy and level of detail of Work-As-Executed Design Documentation are equivalent to those in the Design Documentation used for construction and are sufficient to describe, to enable and to facilitate the efficient operation and maintenance of the assets forming the Works;
- (vi) include in Work-As-Executed Design Documentation, the final survey drawings undertaken and signed by a licensed surveyor, in accordance with the Surveying and Spatial Information Regulation 2012 (NSW), certifying the positioning of the Works and Handover Works relative to the primary survey grid and the cadastral boundaries;
- (vii) include new and updated asset owner's detailed site survey drawings prepared in accordance with the ASA requirements (TfNSW Standard T MU MD 00006 ST Engineering Drawings and CAD Requirements) and Sydney Trains' requirements as part of the Work-As-Executed drawings;
- (viii) certify, via a statutory declaration that each item of Work-As-Executed Design Documentation is accurate, complete and correct, and that the Works as completed are wholly contained within the Project Site;
- (ix) identify and cross reference assets on Work-As-Executed Design Documentation with the information in the Asset Register in accordance with this Appendix section 1.3.13 "Asset Registers".
- (x) ensure the Work-As-Executed Design Documentation complies with AS 1100 Technical drawing comply with the AS1100 series of standards and TfNSW Standard T MU MD 00006 ST Engineering Drawings and CAD Requirements unless otherwise instructed by the Principal's Representative. Compliance to TfNSW T MU MD 00006 ST Engineering Drawings and CAD Requirements include submissions to Virtual Plan Room;
- (xi) comply with relevant Asset Owner standards and normal practice for drawing formats. This includes incorporation of a unique "EDMS Number" on every Work- As- Executed drawing. A batch of EDMS numbers for use on the Works will be provided by the Principal's Representative on request from the Contractor;
- (xii) where necessary to describe the Works or Handover Works, or where directed by the Principal's Representative, include digital photographs of specific aspects of the Works and Handover Works in Work-As-Executed Design Documentation.

3.25 Test certificates

- (a) All certificates and all associated test results issued in respect of the Works must be provided in the Operations and Maintenance Manuals.

3.26 Special Tools, Facilities and Equipment

- (a) The Schedule of Special Tools, Facilities and Equipment in the Operation and Maintenance Manuals must:
 - (i) include the recommended number of special tools, facilities and equipment required for the operation and maintenance of the Works;
 - (ii) identify the items required to perform specific maintenance, repair and recovery tasks on the systems, including scheduled preventative maintenance of the systems, the removal, installation and testing of rotatable and repairable items, and other procedures, such as temporary repairs during normal operating periods for unscheduled failures with follow-up maintenance and emergency recovery; and
 - (iii) include any special purpose test equipment and facilities needed in support of the maintenance tasks, including specialist hand-tools.
- (b) The Schedule of Special Tools, Facilities and Equipment must include:
 - (i) details of, and a specification for, each item;
 - (ii) purpose of the item;
 - (iii) maintenance requirements for each item;
 - (iv) supplier;
 - (v) the quantity required;
 - (vi) price and validity period expected; and
 - (vii) delivery times.

3.27 Training Materials

- (a) All relevant training aids and materials required to provide training for the operators and maintainers of the Works must be included in the Operation and Maintenance Manuals

3.28 List of Reference Documents

- (a) Rail Network Asset Management Information Requirements
 - (i) T MU AM 01001 ST Life Cycle Costing
 - (ii) T MU AM 01002 MA Maintenance Requirements Analysis Manual
 - (iii) T MU AM 01003 ST Development of Technical Maintenance Plans
 - (iv) MU AM 01003 F1 Blank FMECA Sheet
 - (v) T MU AM 01003 F2 Blank Service Schedule Sheet

- (vi) T MU AM 01003 F3 Blank TMP Sheet
 - (vii) T MU AM 01003 F4 TMP Review and Authorisation Form
 - (viii) T MU AM 01004 ST Maintenance Service Schedule Classification and Compliance
 - (ix) T MU AM 01005 ST Asset Handover Requirements
 - (x) T MU AM 01006 ST Asset Reference Codes
 - (xi) T MU AM 01006 F1 Asset Reference Code Form
 - (xii) T MU AM 01007 TI Asset Reference Codes Register
 - (xiii) T MU AM 01008 ST Technical Maintenance Plans and Coding System
 - (xiv) T MU AM 01009 TI Technical Maintenance Coding Register
 - (xv) T MU AM 01010 ST Framework for Developing an Asset Spares Assessment and Strategy
 - (xvi) T MU AM 01010 F1 Blank Spares Requirements Analysis Model Form
 - (xvii) T MU AM 02001 GU Developing Configuration Information Delivery Plans
 - (xviii) T MU AM 02001 ST Asset Information and Register Requirements
 - (xix) T MU AM 02002 TI Asset Classification System
 - (xx) T MU AM 02003 TI Register of Asset Information Systems and Repositories
 - (xxi) T MU AM 06007 GU Guide to Requirements Definition and Analysis
 - (xxii) T MU AM 06009 ST Maintenance Concept Definition
 - (xxiii) AMD-AMP-GD-002 Sydney Trains Asset Information Submission Guideline for New or Altered Assets
 - (xxiv) AMD-AMP-GD-002 Appendix A – Sydney Trains Asset-Information-Delivery-Form
 - (xxv) AMD-AMP-GD-002 Appendix B - Sydney Trains Asset-Information-Delivery-Tracking-Sheet
 - (xxvi) AMD-AMP-GD-002 Appendix C - Asset Information Requirements Packs
 - (xxvii) Sydney Trains Configuration Management Plan
 - (xxviii) Sydney Trains Stakeholder Engagement Guideline for Transport Projects
- (b) Other Documents
- (i) T MU MD 00006 F1 Metadata Spreadsheet for Engineering Drawings
 - (ii) T MU MD 00006 ST Engineering Drawings and CAD Requirements
 - (iii) T MU MD 00006 TI Technical Information for CAD and Engineering Drawings
 - (iv) CAD Resources - 00 Title Blocks

- (v) CAD Resources - 01 Common_Resources.zip
- (vi) CAD Resources - 02 Track
- (vii) CAD Resources - 03 Civil
- (viii) CAD Resources - 04 DSS
- (ix) CAD Resources - 05 Architecture
- (x) CAD Resources - 06 Electrical
- (xi) CAD Resources - 07 Signals
- (xii) CAD Resources - Project Folder Project Folder Description
- (xiii) AS 4799 Installation of underground utility services and pipelines within railway boundaries
- (xiv) AS 5488 Classification of Subsurface Utility Information (SUI)
- (xv) Building Code of Australia

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Appendix 6 Indra Specification



Sydney Metro City & Southwest

Sydney Yard Access Bridge Project Contract Schedules

Schedule C1

Scope of Works and Technical Criteria
Appendix 6
Indra Specification

PROJECT	Sydney Metro City & Southwest	DATE	18 January 2017
GROUP	Sydney Metro City & Southwest	STATUS	Execution Version
AUTHOR	Transport for NSW	REVISION	
COMPANY	Transport for NSW	FILE NUMBER	
FILE NAME	SYAB Schedule C1 SWTC Appendix 6		

Contents

1	Indra Specification	1
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1 Indra Specification

- (a) The Indra Specification is included at Attachment 1 to this Appendix 6.

Attachment 1



indra

IAD-WIS-10-001 WORK INSTRUCTION

STANDARD CABLING AND CONTAINMENT WORK INSTRUCTION FOR SYDNEY TRAINS

Version: No .2

Date: 09/11/2015

Page: 1/ 39

This document has been:

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CONTENTS



1	PURPOSE	5
2	SCOPE	5
3	DEFINITIONS AND ABBREVIATIONS	5
4	FLOWCHART AND RELATED PROCESS	5
5	INSTALLATION OF CABLES AND WIRING	5
5.1	Installation Requirements	5
5.2	Cable Installation	5
5.3	Cable Schedules, Testing and Sign Off	7
5.4	Cable and Wire Identification	8
5.5	Cabling and Containment Specification	8
5.5.1	Above Ground Station\Car Park Cabling and Containment.....	9
5.5.2	Cable Specifications for all cables except Cat6A in ground.....	11
5.5.3	In-Ground Cabling and Containment.....	18
5.5.4	In-Ground Cable Specifications	19
5.5.5	Under Ground Stations Cabling and Containment	20
5.5.6	Underground Station Cable Specifications.....	21
5.5.7	Rigid Containment	23
5.5.8	Cable Trays	23
5.5.9	Cable Duct.....	23
5.5.10	Saddles and Support Brackets.....	23
5.5.11	Fittings and Junction Boxes	24
6	INSTALIATION OF EQUIPMENT	24
6.1	Panel Wiring	24
6.2	Field Equipment.....	25
6.3	Equipment Earthing	25
6.3.1	Substation Earthing	25
6.4	Camera Monitoring Poles	26
6.4.1	Height.....	26
6.4.2	Construction	26
6.4.3	Shared Services Poles.....	26
6.4.4	Wind Loading.....	26
6.4.5	Installation	26
7	REFERENCE DOCUMENTATION	27
8	VERSION CONTROL	28
9	FORMS	28
ANNEX A	ACRONYMS, ABBREVIATIONS AND DEFINITIONS	A-1
A-1	LIST OF ACRONYMS AND ABBREVIATIONS.....	A-1
A-2	LIST OF DEFINITIONS.....	A-2
ANNEX B	CONTAINMENT AND DUCTING	B-1
ANNEX C	UNDERGROUND (and deemed to be underground) STATIONS ...	C-1
ANNEX D	CONTRACTOR INSTALLATION QA REPORT	D-1
ANNEX E	R&M Installation and Testing Guideline	E-1
ANNEX F	ITP Station Inspection and Test Plan	F-1

LIST OF TABLES



Table 1: All IP cameras maximum cable run from switch location 100 metres	11
Table 2: All IP Camera cable terminations at the field end	11
Table 3: All IP Camera cable terminations at the rack end	12
Table 4: All IP Cameras Rack Patch Panels	12
Table 5: All IP Cameras Rack Patch Panels	13
Table 6: Fiber Multimode Cable (6 Fibers).....	14
Table 7: Fiber Multimode cable (12 Fibers).....	14
Table 8: Fiber Multimode Cable (24 Fibers).....	14
Table 9: Fiber Rack Patch Panel.....	15
Table 10: Fiber Rack Patch Panel.....	15
Table 11: Fiber Adapters	16
Table 12: LC- Pigtail	16
Table 13: Splice Tray.....	17
Table 14: Heat Shrink Splice Protection.....	17
Table 15: Help point units maximum cable run from Switch location up to 100 metres.....	17
Table 16: All IP cameras maximum cable run from switch location 100 metres	19
Table 17: Help point units maximum cable run from Switch location up to 100 metres.....	19
Table 18: Help point units maximum cable run from Switch location up to 100 metres.....	21
Table 19 REFERENCE DOCUMENTATION	27
Table 20 VERSION CONTROL.....	28
Table 21 Forms	28
Table 22 LIST OF ACRONYMS AND ABBREVIATIONS	A-1
Table 23 LIST OF DEFINITIONS	A-2
Table 24 Containment and Ducting	B-1
Table 25 Underground Containments and pits.....	B-2
Table 26 Underground Line Crossings (ULX)	B-2
Table 27 Minimum number of fiber connections required per Device	B-2
Table 28 List of Underground Stations	C-1
Table 29 List of Stations out of the current scope	C-2
Table 30 Containment and Ducting	D-2

1 PURPOSE

This specification covers the minimum requirements for the installation of Security Systems performed on behalf of Indra Australia Pty Ltd.

This specification, where applicable shall be deemed to be used in conjunction with the latest editions and revisions of the Australian Standards and local Statutory Rules and Regulations affecting these types of installations.

This specification is for the sole use of Indra's staff and Indra's subcontractors in performing rail associated work.

2 SCOPE

This specification is intended to detail specific requirements of materials and methods of installation to meet Indra's standards.

Every project is further specified by the project installation manual and the customer's specification. Where these conflict with the requirements of this specification, the Indra Project Manager will provide an order of precedence of documentation. It shall be the sub-contractor's responsibility to be conversant with and comply with the specifying documentation.

3 DEFINITIONS AND ABBREVIATIONS

Refer to ANNEX A

4 FLOWCHART AND RELATED PROCESS

Not Applicable

5 INSTALLATION OF CABLES AND WIRING

5.1 Installation Requirements

All cable routes shall be designed to be as unobtrusive as possible, both to reduce visual impact on surroundings and to avoid drawing attention to the presence of copper cable.

5.2 Cable Installation

The main cable route shall generally be installed on one side of the track and shall cross the track the least possible number of times. Local cable routes shall be installed as required.

All electrical wiring shall conform to current SAA wiring rules. There shall be no exposed wiring. All plugs and sockets shall be of the outdoor environmental type.

Care has to be taken that the physical separation of high and low-current cables is maintained. This issue is covered in detail under chapter 3.2.4.4(R&M Installation and Testing Guideline).

Local conditions may require that greater clearances than listed here be used.

A minimum clearance of 130 mm must be maintained between data cables and lamp mountings such as neon, incandescent and discharge lamps (e.g. mercury-vapour lamps).

UTP-systems intended to support 10G Base-T require significantly greater clearances than considered by EN 50174-2, to leave a min of 300mm between 10GBase-T data cables and power cables.

Cables shall be laid neatly in heavy-duty containment and parallel in trenches. Special care must be taken at bends or corners in the cable route and at entries into buildings to prevent the interlocking or bunching of cables.

All cable harnesses and looms shall be supported and laced in such a manner so as not to cause stress on any conductors.

Cables shall be installed in continuous lengths without breakage or connections within the cable route.

Care will be taken when routing cables in under floor system, not to pinch the cables to avoid probable damage to the cables.

Avoid coiling excess cable as it can cause return loss reflections which shall lead to a fail during acceptance testing.

The cables may not be unrolled over the sides of the reel flanges (This risks twisting the cables). The geometry of the symmetrical pairs is noticeably changed).

Care must be taken to prevent the ingress of moisture in to the ends of cable during installation to maintain the properties of the cable and ensure compliance at time of testing

Correct tools and pulling sock's to be used to ensure the proper pulling force when unrolling the cable.

Vertical installations strain relief is recommended at least every 600 mm. Avoid cable bundling or limit the quantity of cables bundled together to reduce the occurrence of alien crosstalk and cable stress when moving or bending, and to make sure the specified bending radii is not exceeded

All manufactures cable preparation and module termination procedures are to be followed refer to 4.2 ANNEX E R&M Installation and Testing Guideline.

Installers must follow the proper and professional installation considering at minimum the following list and any other higher procedures:

- Adequate personnel must be present at site to pull the installation cables.
- Before routing the cables, edges of openings and pipes must be rounded off, to avoid damaging the jacket when the cables are later routed and fastened.
- Cable ducts or conduits must be used when passing through walls.
- When installing the cable, the bending radius may not be less than that specified by the cable manufacturer. The same applies after the cable has been installed.

- To avoid accidental cable damage, the cables should be installed directly from the cable reels along the cable routes and should not be laid out along the floor.
- Ensure that adequate tools for cable unrolling, lay down and/or pulling as well as pulleys for corners are available and personnel instructed on their usage.
- Any sign of stress or kinks in the cable sheath insulation or conductors must be avoided (e.g. caused by improper fastening or by the weight of crossed installation cables).
- The radius of the channel route must be selected so that the specified minimum bending radius is maintained when changing direction.
- Metallic ducts or raceways must be properly connected and bonded to ground.
- Do not bundle cables (especially U/UTP) together. If this is not possible/ practical then limit the number of cables bundled together.
- Cables tie guns or similar tools may not be used when fastening data cables, nor may they be used when fastening cable ties to provide connection module strain relief.
- No pressure may be exerted on the cables because of improper tying from using quick cable installers or cable ties. The basic principle is that the geometry of the cable jacket must not change.
- Cable channels must be closed after work has been completed (raised floors, wall ducts, etc.) to avoid dirt and damage which could influence the transmission properties of the installed cables.
- Data cables are sensitive to direct sources of heat: hot air blowers or gas burners used for installing shrink tubing must not be used in the vicinity of data cables.
- If chemicals are used to facilitate cable pulling, be sure they are compatible with the cables sheath material.
- This is also applicable to any chemical (mostly spray type) used for other types of cables that may accidentally get in contact with data cables.

All Cables shall be installed in compliance to ANNEX E R&M Installation and Testing Guideline.

5.3 Cable Schedules, Testing and Sign Off

Cable schedules shall be provided by Indra for all cabling. After the cable installation and labelling has been completed, the sub-contractor shall provide verification that all cable runs are satisfactory for use and are as shown on the schedules by carrying out and documenting on the Indra cable schedules, the following minimum checks.

1. A continuity check using an Ohm meter of all cores or power cables from the panel to the terminations in switchboards and field devices. (Note: Do not merger electronic equipment.)
2. TDR Checks on co-axial cables.

3. Cat6 certification testing to cable manufactures recommendation using either Fluke Fluke DSX 5000 CableAnalyzer, or approved other, a digital copy of test results for each cable must be supplied to Indra as part of the sign off procedure.
4. Optical loss Tests on Fibre cables using either Fluke Fluke DSX 5000 CableAnalyzer, or approved other, a digital copy of test results for each cable must be supplied to Indra as part of the sign off procedure.
5. A valid calibration test for all equipment used (typically once per year). A certification (pdf) to be submitted along with testing sheets.
6. Check that cores are free from spurious voltages, especially AC voltages.
7. Ensure the bend radius of all cabling does not exceed manufacturers' recommendations. Referring to ANNEX E R&M Installation and Testing Guidelines.
8. Cleanliness and environmental conditions must be maintained to the highest of standards especially when installing connectors as they are very sensitive to dirt.

5.4 Cable and Wire Identification

Cables shall be identified by suitable cable markers approved by the Indra Project Manager unless specified elsewhere. Where a new cable marker is to be used, a sample of the cable marker shall be provided to Indra for approval prior to its use.

These marking systems will be correctly sized for the installed cable to ensure the label is always legible, visible and secure, i.e. cannot slip.

All cables will be labelled at both ends with either the terminal descriptions into which they are terminated or identically with the description provided by Indra on the cable schedule. The cable markers shall be mechanically printed. Hand written cable markers will not be acceptable.

5.5 Cabling and Containment Specification

No containment less than twenty-five (25) millimetres nominal size shall be used, and containments shall be sized to allow ease of cable installation and replacement. Allowance shall be made for thermal expansions of rigid PVC containment. Any installed containment must have 25% spare capacity as a minimum. Power and communications cabling is to be segregated as per the relevant Australian Standard.

Orange containment shall be used for power cables only. White containment shall be used for CCTV cabling. Power and communications cabling is to be segregated as per the relevant Australian Standard.

Any conductive containment travelling between structures (eg two separate awnings, a platform and a bridge, etc) shall have a least two (2) isolation gaps at a distance of greater than two metres (2000mm) apart.

Any conductive containment fixed to railing and travelling within two metres of an OHW Structure shall have at least two isolation points at least two metres (2000mm) either side of the OHW Structure.

All isolation points shall be at least 50mm wide and of a material that offers suitable mechanical and environmental protection.

Any containment installation must consider the cable bending rule for the cable's contained in addition to the containment its-self.

Specific Cabling and Containment specifications vary depending on the location and type of site. They are broken down into site specific requirements as follows:

- **Above Ground Station\Car Park Cabling and Containment**
- **In-Ground Cabling and Containment**
- **Under Ground Station Cabling and Containment**

In-Ground is defined as: in trench in ground; or contained in underground pit and pipe system

Above-Ground is defined as: not In-Ground

5.5.1 Above Ground Station\Car Park Cabling and Containment

There are two different environments in the case of an above ground station or car park that require different cable types.

All containment accessible to the public up to three (3) metres in height shall be in steel, elsewhere containment may be PVC. Steel shrouds are not allowed to be used for this purpose. Junction boxes made of steel shall be used where readily accessible. All containment at or below three (3) metres in height shall be securely fixed with double sided saddles using security fixings (i.e. security screws or pop rivet).

Steel flexible containment of 300mm in length shall be used where cables enter the camera housings if cables cannot be concealed in the camera support. No other flex containment shall be used on any other part of the installation unless otherwise approved by the Indra Site Supervisor.

Where two (2) or more steel containments are run side by side or run parallel on any surface they shall be spaced at such a distance to allow one of the containments to be dismantled without affecting the remainder.

All containment shall be securely installed to prevent vandalism. Double sided saddles with a maximum of 500mm centres shall be the minimum requirement. Joints between steel and PVC containment are not permitted at visible locations. All containment must be sealed to prevent the ingress of water.

Each length of containment shall be fitted with a sturdy draw wire, securely anchored and appropriately identified at each end to permit cables to be pulled through. Sufficient draw in boxes will be installed to enable rewiring of the containment if required. All lids will be secured using security fixings (i.e. security screws or pop rivet).

Flexible Containment

Cables, where rigid containment is not suitable, shall be protected by flexible containment for the final part of their run from the duct or rigid containment to field mounted equipment, the containment being secured by the correct thread size connector at each end. Under no circumstances is the instrument or equipment to carry any mechanical load or stress. Flexible containment runs shall not exceed 500mm (0.5) metre in length unless otherwise specified. Containment is to be protected or installed in such a way as to be safe from mechanical damage in addition to being vandal resistant, therefore flexible steel encased containment shall be utilised.

Rigid Containment

All saddles, where used, shall be spaced at intervals not exceeding 500mm over the length of the containment run, and otherwise complying with AS3000. Saddles shall be fitted to within 10cm from Junction Boxes, elbows, bends etc. This applies to all incoming and leaving containments. Double saddles shall be used unless otherwise approved by the Indra Project Manager, and shall be fixed using appropriately sized security screws or similar.

Containment entering cabinets and other equipment shall finish completely flush with the lock nut or screwed inlet provided, or be fitted with an approved thermo plastic bush. PVC containment joins must be secured using the appropriate glue. The threaded part of steel containment terminating in enclosures shall not go past the leading nut.

Containment terminating at a cable tray or ladder, if approved, shall be securely attached to the tray or ladder using a "U" bolt, saddle or other approved method, and shall be bushed. The method of installation shall not cause the cable to be strained or bent tighter than its minimum bending radius.

All containment shall be free from burrs, sharp edges and internal flaws which may cause damage to cables. Any abrasions to galvanised surfaces of containments shall be painted with anti-corrosive paint.

For containment and ducting sizing refer to Appendix B

5.5.2 Cable Specifications for all cables except Cat6A in ground

5.5.2.1 All IP cameras maximum cable run from switch location 100 metres (including Patch cables)

Item	Specifications
Cat.6A, U/FTP R&M Cable R308247	ISO/IEC 11801 ed. 2.2; IEC 61156-5 2nd ed.; EN 50173-1; EN 50288-x-1; Fire rating: IEC 60332-1; IEC 60754-2; IEC 61034; Cable class : Installation Cable Category : Cat.6A ISO Cu cable shielding : U/FTP Number of fibers / conductors : 8 Stranding : 4P Cable jacket material : LSZH Cable jacket characteristics : cable, metal-free , zero-halogen, flame-retardant Cable protection : no protection Cable overall diameter : nominal value Ø 7.1 - 7.6 mm Fiber / conductor diameter : AWG23 Color code RAL : 7035 Color : light gray

Table 1: All IP cameras maximum cable run from switch location 100 metres

5.5.2.2 All IP Camera cable terminations at the field end

Item	Specifications
RJ45 Connector R&M Cable R312231	Standardisation : IEC 60603-7 RJ45, Cat.5; ISO/IEC 11801: IEC 60603-7-3; EN 50173: May 2011; Connector class : connector Number of connectors (A) : 1 Connector type (A) : RJ45 Category connector (A) : Cat.5e Shielding - connector (A) : Yes Protection class (IP) connector (A) : 20 Color code RAL : 7042 Color : traffic gray Dimensions : 59 x 14 x 14.6 mm Material : plastic: PC, fiber-glass reinforced / PA6.6 / PA66 Wiring diagram : TIA 568-A (AWG 26 - 23, AWG 26/7 - 23/7) Poles : 8

Table 2: All IP Camera cable terminations at the field end

5.5.2.3 All IP Camera cable terminations at the rack end



Item	Specifications
RJ45 Connection Module R&M Cable R813504	Standardisation : IEC 60603-7-51: Electrical Characteristics of the Telecommunication Outlets; ISO/IEC 11801 ed. 2.2: June 2011; EN 50173-1: May 2011; Connector class : Connection module Connector type (A) : RJ45 Category connector (A) : Cat.6A ISO Shielding - connector (A) : Yes Holder for connector / module : Support Plate Color : metallic Wiring diagram : 568A / 568B Poles : 8

Table 3: All IP Camera cable terminations at the rack end

5.5.2.4 All IP Cameras Rack Patch Panels

Item	Specifications
RJ45 Patch Panel R&M Cable R813483	Fastening (inch) : 19" Height Units (U) : 1 Rack mounting version : Sub-rack Capacity (ports) : 24 Holder for connector / module : Special Color : front: black (RAL 9005) / steel: blue, chromitized Assembly : empty Dimensions : 43.65 x 482.6 x 83.4 mm Material : plastic: PC, fiber-glass reinforced / steel: DC01 (1.0330), 1.5 mm

Table 4: All IP Cameras Rack Patch Panels

5.5.2.5 All IP Cameras Rack Patch Cords



Item	Specifications
RJ45 Patch Cord Cat.6A R&M R820804	Standardisation : Compliant with Cat.6A ISO, Class EA (500 MHz) requirements: ISO/IEC 11801 ed. 2.2. Complies with Category 6A ISO requirements of the standards ISO/IEC 11801 ed. 2.2: June 2011, EN 50173-1: May 2011, as well as TIA 568-C.2. Compliant with Cat.6A ISO component standards IEC 60603-7-51. Fulfilled the standard IEC 61935-2:2010. Cable class : Patch Cord Connector class : connector Connector type (A) : RJ45 Category connector (A) : Cat.6A ISO Shielding - connector (A) : Yes Connector type (B) : RJ45 Category connector (B) : Cat.6A ISO Shielding - connector (B) : Yes Category : Cat.6A ISO Cu cable shielding : U/FTP Number of fibers / conductors : 8 Stranding : 4P Cable jacket material : LSZH Cable jacket characteristics : cable, metal-free ; zero-halogen Cable overall diameter : max. 6.5 mm Conductor type : stranded conductor Fiber / conductor diameter : AWG 26/7 Color : cable, gray (RAL 7035) Length (meter) : 1.5

Table 5: All IP Cameras Rack Patch Panels

5.5.2.6 Fiber Multimode Cable (6 Fibers)

Item	Specifications
Fiber Multimode Cable (6 Fibers) R&M Cable R308310	Standardisation: ISO/IEC 11801:2002 IEC 60794-1-2 E1; IEC 60794-1-2 E11; IEC 60794-1-2 E3; IEC 60794-1-2 F1; IEC 60332-1; IEC 60332-3C; IEC 61034; IEC 60754-2 Cable class: Loose Tube Cable design: I/A-DQ(ZN=B)H Fiber class: OM3 Number of fibers / conductors: 6 Cable jacket material: LSZH Cable jacket characteristics: cable, water-tight Cable jacket characteristics: cable, metal-free Cable jacket characteristics: zero-halogen Cable protection: rodent protection Cable overall diameter:6.5 mm Conductor type: loose tube, gel-filled Fiber / conductor diameter:G50/125µm Fiber type: Multimode (MM) Color: green

Table 6: Fiber Multimode Cable (6 Fibers)



5.5.2.7 Fiber Multimode Cable (12 Fiber)

Item	Specifications
Fiber Multimode Cable (12 Fibers) R&M Cable R308214	Standardisation: ISO/IEC 11801:2002 IEC 60794-1-2 E1; IEC 60794-1-2 E11; IEC 60794-1-2 E3; IEC 60794-1-2 F1; IEC 60332-1; IEC 60332-3C; IEC 61034; IEC 60754-2 Cable class: Loose Tube Cable design: I/A-DQ(ZN=B)H Fiber class: OM3 Number of fibers / conductors: 12 Cable jacket material: LSZH Cable jacket characteristics: cable, water-tight Cable jacket characteristics: cable, metal-free Cable jacket characteristics: zero-halogen Cable protection: rodent protection Cable overall diameter:6.5 mm Conductor type: loose tube, gel-filled Fiber / conductor diameter:G50/125µm Fiber type: Multimode (MM) Color: green

Table 7: Fiber Multimode cable (12 Fibers)

5.5.2.8 Fiber Multimode Cable (24 Fibers)

Item	Specifications
Fiber Multimode Cable (24 Fibers) R&M Cable R308215	Standardisation: ISO/IEC 11801:2002 IEC 60794-1-2 E1; IEC 60794-1-2 E11; IEC 60794-1-2 E3; IEC 60794-1-2 F1; IEC 60332-1; IEC 60332-3C; IEC 61034; IEC 60754-2 Cable class: Loose Tube Cable design: I/A-DQ(ZN=B)H Fiber class: OM3 Number of fibers / conductors: 24 Cable jacket material: LSZH Cable jacket characteristics: cable, Cable jacket characteristics: cable, metal-free Cable jacket characteristics: zero-halogen Cable protection: rodent protection Cable overall diameter:7 mm Conductor type: loose tube, gel-filled Fiber / conductor diameter:G50/125µm Fiber type: Multimode (MM) Color: green

Table 8: Fiber Multimode Cable (24 Fibers)

5.5.2.9 Fiber Rack Patch Panel (24 fibers)

Item	Specifications
LC-Duplex patch panel R&M Cable R795752	Standardisation: IEC 60 297-3 Fastening (inch): 19" Height Units (U): 1 Rack mounting version: Patch Panel Version: breakout Capacity (ports): 12xSC / 24xLC Number of connectors (A): 12 Connector type (A): SC Duplex Number of connectors (B): 24 Connector type (B): LC Duplex Color: black Dimensions: 43.6 x 482.6 x 230 mm Material steel: DC04 (1.0338), 1.5 mm, powder-coated

Table 9: Fiber Rack Patch Panel

5.5.2.10 Fiber Rack Patch Cord

Item	Specifications
LC-Duplex patch Cord R&M Cable R323063	Standardisation: LC connector acc. to IEC 61754-20 Cable class: Patch Cord Connector class: connector Number of connectors (A): 1 Connector type (A): LC Duplex Protection class (IP) connector (A): 20 Polishing connector (A): PC Connector color (A): beige Lever- frame-coding connector (A): color Lever color connector (A): turquoise Number of connectors (B): 1 Connector type (B): LC Duplex Protection class (IP) connector (B): 20 Polishing connector (B): PC Connector color (B): beige Lever- frame-coding connector (B): color Lever color connector (B): turquoise Cable design: I-V(ZN)H Patch Cord type: Duplex Figure 8 Fiber class: OM3 Cable jacket material: LSZH Cable jacket characteristics: cable, metal-free Cable jacket characteristics: zero-halogen Cable overall diameter: F8 2.0x4.1 mm (±0.15) Conductor type: semi-tight buffer, gel-filled Fiber / conductor diameter: G50/125µm Fiber type: Multimode (MM) Color Cable: turquoise

Table 10: Fiber Rack Patch Panel

5.5.2.11 Fiber Adapters

Item	Specifications
LC-Duplex Adapter R&M Cable R820417	Adapter LC-Duplex 2 Philips head screws M2 x 8, blue galvanized Standardisation : acc. to IEC 61754-20 Connector class : coupling Adapter Number of connectors (A) : 1 Connector type (A) : LC Duplex Protection class (IP) connector (A) : 20 Polishing connector (A) : PC Attenuation grade IL - connector (A) : M Connector color (A) : beige Sleeve material : ceramic Adapter fastening method : end cap Fiber type : Multimode (MM) Dimensions : 55 / 29.2 x 22 x 9.35 mm Material : steel: X10CrNi18-8 (1.4310) / plastic: PBT , fiber-glass reinforced (halogen-free)

Table 11: Fiber Adapters

5.5.2.12 LC- Pigtail

Item	Specifications
LC-Pigtail R&M Cable R795610	Packing unit of 12 coloured tight buffer Ø 0.9 mm one side fitted with LC connector Standardisation : LC connector acc. to IEC 61754-20 Cable class : Pigtail Connector class : connector Number of connectors (A) : 1 Connector type (A) : LC Protection class (IP) connector (A) : IP 20 Polishing connector (A) : PC Attenuation grade IL - connector (A) : Bm Return loss grade RL - connector (A) : 3 Connector color (A) : beige Fiber class : OM3 Cable jacket characteristics : cable, metal-free ; zero-halogen Cable overall diameter : Ø 0.9 mm Conductor type : tight buffer Fiber / conductor diameter : G50/125µm Fiber type : Multimode (MM) Color : turquoise Length (meter) : 2.5

Table 12: LC- Pigtail

5.5.2.13 Splice Tray

Item	Specifications
Splice Tray Additional R&M Cable R308444	1 splice tray R40 4 film hinges, small, for stacking 4 cable ties 2 screws for splice holder Installation instructions Color code NCS : 2502-B Color : medium gray Dimensions : 188 x 10,5 x 116 mm Material : plastic: PC + ABS

Table 13: Splice Tray

5.5.2.14 Heat Shrink Splice Protection

Item	Specifications
Heat Shrink Splice Protection R&M Cable R30087-35	Shrink tube (Ø 3 mm) with metal Weight:0.619 G Dimensions Ø 3 x 35 mm

Table 14: Heat Shrink Splice Protection

5.5.2.15 Help point units maximum cable run from Switch location up to 100 metres

Item	Specifications
Ethernet	Cat.6A, U/FTP. R&M Cable R308247
Power	2-18 AWG stranded bare copper pairs with polyolefin insulation, PVCjacket with ripcord 5341UE Multi-Conductor
Signal	2-22 AWG stranded bare copper pairs with polyolefin insulation, PVC jacket with ripcord E.g. Belden 5541UE or equivalent.

Table 15: Help point units maximum cable run from Switch location up to 100 metres

5.5.3 In-Ground Cabling and Containment

All containment shall be arranged in fixed format for the full length of the platform or paved area and shall be supported so that backfilling will not disturb the format.

Stabilised sand shall be placed around the containments and compacted to hold them securely in position. The compacted sand shall cover the containments by at least 50mm. There shall be no depression evident as a result of trenching, nor shall there be a trip hazard resulting from the trenching.

Where pedestrian traffic is involved the depth of the containment from the top of the trench to the top of the highest layer of containment shall be not less than 300mm.

Where motor vehicles can run over the surface the containment shall be buried not less than 600mm.

In rock or to avoid obstructions the depth of containment cover can be reduced to 300mm in vehicular areas provided the containment is covered with 150mm reinforced concrete, minimum reinforcement shall be two layers of F62 mesh.

Cable pits for cable pulling purposes shall be provided in platforms at not greater than 35 metre intervals and constructed in accordance with Appendix B. All pits are to be sealed and lockable.

For containment and ducting sizing refer to Appendix B.



5.5.4 In-Ground Cable Specifications

For cable specification refers to 5.5.2 and refers to 5.5.4.1/ 5.5.4.2 for Data, the help point power and signal cables.

5.5.4.1 In-Ground cable run from switch location maximum 100 metres (including Patch cables)

Item	Specifications
Cat.6A, U/FTP R&M Cable R795863	CAT6 Outdoor UTP, water blocked, UV resistant, PE Jacket, E.g. R&M R795863

Table 16: All IP cameras maximum cable run from switch location 100 metres

5.5.4.2 Help point units maximum cable run from Switch location up to 100 metres

Item	Specifications
Ethernet	CAT6 Outdoor UTP, waterblocked, UV resistant, PE Jacket, E.g. R&M R795863
Power	1 pair 18AWG (7x26) TC conductors (coloured appropriately for identification), double insulated, PVC jacket, water blocking material under jacket, 10 year manufacturer's warranty. E.g. Belden 5300U1 or equivalent.
Signal	2 pair 22 AWG (7x30) TC conductors, 1 pair shielded, 1 pair unshielded, PVC jacket, water blocking material under jacket, 10 year manufacturer's warranty. E.g. Belden 5502G1 or equivalent.

Table 17: Help point units maximum cable run from Switch location up to 100 metres

5.5.5 Under Ground Stations Cabling and Containment

All cables and containment run in an underground station environment, as classified by Sydney Trains, shall be halogen free.

All cables and containment run into rooms/cabinets/enclosures containing Fire Management Systems (FMS) must be flame retardant to IEC 60332-2 (EN 50265-2-2).

No containment less than twenty-five (25) millimetres nominal size shall be used, and containments shall be sized to allow ease of cable installation and replacement. Allowance shall be made for thermal expansions of rigid Halogen Free containment. Any installed containment must have 25% spare capacity as a minimum. Power and communications cabling is to be segregated as per the relevant Australian Standard.

All containment accessible to the public up to 3 metres in height shall be in steel, elsewhere containment may be Halogen Free. Steel shrouds are not allowed to be used for this purpose. Junction boxes made of steel shall be used where readily accessible. All containment at or below 3 metres in height shall be securely fixed with double sided saddles using secure fixings (i.e. security screws or pop rivet).

Steel flexible containment of 300mm in length shall be used where cables enter the camera housings if cables cannot be concealed in the camera support. No other flex containment shall be used on any other part of the installation unless otherwise approved by the Indra Project Manager.

Where two (2) or more steel containments are run side by side or run parallel on any surface they shall be spaced at such a distance to allow one of the containments to be dismantled without affecting the remainder.

All containment shall be securely installed to prevent vandalism. Double sided saddles with a maximum of 500mm centres shall be the minimum requirement. Joints between steel and Halogen Free containment are not permitted at visible locations. All containment must be sealed to prevent the ingress of water.

Each length of containment shall be fitted with a suitable draw-wire (such as Jetline, rope, etc...), securely anchored at each end to permit cables to be pulled through. Cabling is not to be used as a draw-wire.

Cables, where rigid containment is not suitable, shall be protected by flexible containment for the final part of their run from the duct or rigid containment to field mounted equipment, the containment being secured by the correct thread size connector at each end. Under no circumstances is the instrument or equipment to carry any mechanical load or stress. Flexible containment runs shall not exceed 500mm (0.5) metre in length unless otherwise specified. Containment is to be protected or installed in such a way as to be safe from mechanical damage.

All saddles, where used, shall be spaced at intervals not exceeding 500mm over the length of the containment run, and otherwise complying with AS3000. Saddles shall be fitted to within 10cm from Junction Boxes, elbows, bends etc. This applies to all incoming and leaving containments. Double saddles shall be used unless otherwise

approved by the Indra Project Manager, and shall be fixed using appropriately sized security screws or similar.



Containment entering cabinets and other equipment shall finish completely flush with the lock nut or screwed inlet provided, or be fitted with an approved thermo plastic bush. Halogen Free containment joins must be secured using the appropriate glue. The threaded part of steel containment terminating in enclosures shall not go past the leading nut.

Containment terminating at a cable tray or ladder, if approved, shall be securely attached to the tray or ladder using a "U" bolt, saddle or other approved method, and shall be bushed. The method of installation shall not cause the cable to be strained or bent tighter than its minimum bending radius.

All containment shall be free from burrs, sharp edges and internal flaws which may cause damage to cables. Any abrasions to galvanised surfaces of containments shall be painted with anti-corrosive paint.

For containment and ducting sizing refer to Appendix A.

5.5.6 Underground Station Cable Specifications

For cable specification refers to 5.5.2 and refers to 5.5.6.1 for the help point power and signal cables.

5.5.6.1 Help point units maximum cable run from Switch location up to 100 metres

Item	Specifications
Power	Figure eight 18 AW G 19x29 E.g. Belden 8471NH or equivalent.
Signal	22 AWG, 7/0.25 X 2 copper conductors, 4.3mm to 4.95mm OD. E.g. Belden 8761NH or equivalent.

Table 18: Help point units maximum cable run from Switch location up to 100 metres

All cables run in an underground environment, as classified by TfNSW, shall be Low Smoke and Halogen Free (LSZH).

All cables run into rooms / cabinets / enclosures containing fire management systems (FMS) must be flame retardant to IEC 60332-2 (EN 50265-2-2).

All cables selected for underground use must meet the specifications of the previously specified cable, in both physical and electrical performance. Cable that does not meet the requirements, but which may be considered suitable, must be submitted to Indra for approval prior to installation.

Care has to be taken that the physical separation of high and low-current cables is maintained. This issue is covered in detail under chapter 3.2.4.4(R&M Installation and Testing Guideline) clearances between copper data and power cables.

This is for guidance. For specific cabling requirements, refer to cable schedule for the particular site.

All cable installed in underground stations must meet the following minimum cable specifications.



5.5.7 Rigid Containment

All saddles, where used, shall be spaced at intervals not exceeding 500mm over the length of the containment run, and otherwise complying with AS3000. Saddles shall be fitted to within 10cm from Junction Boxes, elbows, bends etc. This applies to all incoming and leaving containments. Double saddles shall be used unless otherwise approved by the Indra Project Manager, and shall be fixed using appropriately sized security screws or similar.

Containment entering cabinets and other equipment shall finish completely flush with the lock nut or screwed inlet provided, or be fitted with an approved thermo plastic bush. PVC containment joins must be secured using the appropriate glue. The threaded part of steel containment terminating in enclosures shall not go past the leading nut.

Containment terminating at a cable tray or ladder, if approved, shall be securely attached to the tray or ladder using a "U" bolt, saddle or other approved method, and shall be bushed. The method of installation shall not cause the cable to be strained or bent tighter than its minimum bending radius.

All containment shall be free from burrs, sharp edges and internal flaws which may cause damage to cables. Any abrasions to galvanised surfaces of containments shall be painted with anti-corrosive paint.

5.5.8 Cable Trays

Cable trays are to be used in ceiling voids unless otherwise specified or where access does not permit. Cable trays are to be sized to accept the required number of cables with 25% spare capacity. Cable trays rising from the ground or floor in all locations other than electrical risers and switch rooms shall have covers to a height of 1.5 metres, readily removable by one (1) person. Cables are to be secured to the cable tray at minimum 300mm intervals. Cable trays shall be used with proprietary bends and tees. All cable trays shall be adequately supported. Minimum supports shall be 1.5m apart and galvanised. Where different services are installed onto the same cable tray, relevant standards are to be adhered to regarding segregation requirements.

5.5.9 Cable Duct

Extruded PVC grey, open slotted duct from either "Legrand", "Aussie Duct" or NHP or approved equivalent shall be used within control panels and field cabinets. All major cable runs are to be in approved, steel ducting sized to accept the required number of cables with 25% spare capacity. Ducting shall be used with its proprietary bends, tees and other fittings. All ducting shall be adequately supported. Minimum supports shall be 1.5 metres apart.

5.5.10 Saddles and Support Brackets

Saddles and Support Brackets shall be entirely suitable for the type of containment and locations in which they are to be used. PVC accessories shall not be used with steel containment.

5.5.11 Fittings and Junction Boxes

Fittings shall be suitable for use with the type of containment or pipe they are to connect with. All metallic fittings shall be galvanised. Screw types and fixings shall be uniform throughout the installation.

Junction boxes shall be used where two or more cables have been run in a common containment boxes used with galvanised containment shall be cast galvanised and fitted with heavy duty lids. In the case of multiple terminal points an approved sheet steel terminal box shall be installed. Junction and terminal boxes shall only be installed in positions acceptable for maintenance and these positions shall be approved by the Indra Project Manager prior to installation.

No more than two bends and two 45 degree sets or equivalent shall be installed between cable draw-in points.

6 INSTALLATION OF EQUIPMENT

6.1 Panel Wiring

All wiring and installation work must comply with the relevant Australian standards and in particular the following requirements

The sub-contractor shall manufacture the panel(s) either on site or off site as suitable. All equipment required to manufacture the panel that is not supplied by Indra, as detailed on the job material list, shall be supplied by the sub-contractor.

Where appropriate, the panels shall be manufactured in accordance with the supplied Indra panel drawing. All panels will have a double GPO fitted and all equipment in that panel shall be powered via a 3 pin plug. Earthing is to be permanent via earth links or an earth stud. No other 240 VAC supplies are allowed within the control panel. The GPO shall be labelled with its switchboard and circuit breaker number. All other discrete items within the panel shall be labelled with their description or as per the Indra drawing.

All 240 VAC terminals or other exposed 240 VAC connections shall be made safe, eg. protected by Perspex covers or similar and labelled appropriately. 240 VAC cabling within the panel shall be segregated, routed and secured in such a way as to conform to the relevant Australian Standards.

If any other control signals originating from other switchboards are present, the front of the panel shall be labelled with their source switchboard and circuit.

External cables terminating in the control panel shall approach the panel in an orderly fashion with due regard given to cable bending radii, neatness and possible damage to the insulation. Panel location and cable entry shall be arranged to avoid water damage in the event of flooding of spaces/floors above. Particular care is required in the vicinity of open risers. Cables with pairs terminating nearest the cable entry shall be positioned on the side closest to the terminal strip to minimise crossing of pairs. All insulation and earthing is to be left on cables up to the terminals. Sufficient space within the panel is to be left for this purpose.

Earth screens are to be commoned within the panel only, and then connected to an earthlink or terminals set aside for that purpose. Unused cables left within panels or ductworks are to be labelled and isolated with the proper method. All cables terminated in equipment supplied/installed by others shall have minimum insulation rating of 0.6 to 1KV. Short or broken cable shall be rerun; no cable joining will be accepted. Cable colouring shall be consistent throughout the installation and termination. Communications cabling to panels shall have unique colours for their individual cores.

Pre-insulated wire pin, lipped blade or where appropriate spade crimp connectors, shall be used to terminate wires in terminal strips. All terminal strips supplied by the sub-contractor shall be DIN rail mounted. All power cable connection lugs shall be the crimped type, except where otherwise approved. All connector crimping shall be carried out using connector compatible, ratchet controlled crimping tools, having annual tests for crimping pressure.

6.2 Field Equipment

Cable entry into field mounted equipment shall be through the bottom unless approved otherwise due to location or type of equipment. Approved side or top entry cables shall be effectively sealed against ingress of dust and moisture into the equipment. All cable entries shall be sealed tightly with the correct size and type of gland.

Wiring to field equipment is to be terminated using either the appropriate crimp terminations or soldering. When terminating using solder, the solder joint is to be neat and free of burrs, with heat shrink used to cover the termination and overlapping the cable insulation.

6.3 Equipment Earthing

A standard approach to bonding and earthing as per TfNSW earthing specification and in accordance with the relevant Australian Standards shall be applied at all TfNSW stations.

All removable or hinged metal doors, panels or desk tops that carry wired electrical equipment shall be earthed using methods outlined as per Australian Standards.

When the CCTV system spans across the station earthing boundary (eg: into a car park), the installation must take into account the need to keep the station earth and external supply authority earth segregated as per the applicable Sydney Trains earthing standard.

Where it is deemed necessary for 240 VAC mains power to be installed from the main CCTV UPS to a Marshalling Cabinet installed outside the station Earthing Boundary, the mains are to be protected by use of an appropriate Isolation Transformer installed in or adjacent to the main CCTV Rack.

6.3.1 Substation Earthing

Equipment required to be installed in or around substations are to comply with the relevant Sydney Trains

Substation earthing standards.

6.4 Camera Monitoring Poles

6.4.1 Height

As required to provide the cameras nominated field of view but with a minimum height of four (4) metres unless otherwise specified..

6.4.2 Construction

Camera poles to four (4) metres are to be heavy duty galvanised steel hollow hexagonal or round section. Poles to be installed in accordance with the pole manufacturers' recommendations.

Camera poles above four (4) metres are to be heavy duty galvanised hexagonal steel hollow section. Poles to be installed in accordance with the pole manufacturers' recommendations. See-saw type camera poles are to be used unless otherwise specified.

All apertures drilled or cut into the poles after delivery shall be treated against corrosion.

Camera cables shall be installed inside the pole and inside steel flexible containment no longer than

500mm from the point of exit to the camera housing.

6.4.3 Shared Services Poles

Where it is deemed necessary to mount CCTV Cameras on to Lighting Poles, the Lighting Poles must be manufactured in accordance to specification for CCTV Poles noted in this document. In addition to this all other criteria for mounting of cameras must be adhered to.

Where the CCTV Camera is to be mounted above a height of four (4) metres, a "drop-down" (or see-saw) type pole is to be utilised and is to be constructed to a minimum to meet all requirements as laid out in this document. All poles are to be installed into a location ensuring ease of access for serviceability.

All relevant standards for cabling must be adhered to including the use mechanical segregation for all

CCTV Cabling within the lighting pole.

6.4.4 Wind Loading

The wind loading applicable to the pole(s) shall meet the relevant Australian Standards.

As installation, the installer needs to ensure that in a constant wind of eight (8) m/s gusting to sixteen (16)

m/s the displacement produced at the top of the pole is no greater than 20mm.

6.4.5 Installation

All camera poles installed shall be vertically aligned and positioned in accordance with the directions of the Indra Project Manager. Concrete plinths shall be finished off with a 45 degree chamfer, and any bolts or securing fixings installed so as not to present a trip hazard.

7 REFERENCE DOCUMENTATION



The latest version of the following documents will be used as a reference in the application of this procedure:

Title	Document Number
Data Control and Management	IAD-PRO-13-001
Security Standard - Stations	RSS-001 V1.01
Minimum Security Requirements and Design Criteria for Stations	RSS-200 V 1.0
Security Technical Note	TN-S 13/01
Installation requirements for customer cabling	ACIF S009: 2013
Engineering Drawing Handbook (IEAust)	HB 7-1993
Technical drawing - General principles	AS 1100.101: 1992
Identification of the Contents of Piping, Conduits and Ducts	AS 1345: 1995
Lightning protection	AS/NZS 1768:2007
Intruder Alarm Systems (All applicable current parts and amendments)	AS 2201
Degrees of protection provided by enclosures (IP Code)	AS 60529: 2004
Conduits and fittings for electrical installations (All current parts and amendments).	AS/NZS 2053
Electrical installations (known as the SAA Wiring rules).	AS/NZS 3000: 2007
Electromagnetic compatibility (EMC) - Generic standards - Immunity for residential, commercial and light-industrial environments	AS/NZS 61000.6.1: 2006
Information technology - Security techniques - Information security management systems – Requirements	AS/NZS ISO/IEC 27001:2006
Information technology - Security techniques - Code of practice for information security management	AS/NZS ISO/IEC 27002:2006
Quality management systems – Requirements	AS/NZS ISO 9001:2008
Tests on electric and optical fibre cables under fire conditions - Part2-2: Test for vertical flame propagation for a single small insulated wire or cable - Procedure for diffusion flame	IEC 60332-2-2 Ed. 1.0
Information technology - Generic cabling for customer premises (ISO/IEC 11801:2011, MOD)	AS/NZS 3080:2013
Closed circuit television (CCTV) - Management and operation	AS 4806.1-2006
Earth potential rise - Protection of telecommunications network users, personnel and plant - Code of practice	AS/NZS 3835.1:2006
Earth potential rise - Protection of telecommunications network users, personnel and plant - Application guide	AS/NZS 3835.2:2006
Structural design actions - Wind actions	AS/NZS 1170.2:2011

Table 19 REFERENCE DOCUMENTATION

8 VERSION CONTROL

Date	Version	Reason for change
9.11.2015	No.1	First release

Table 20 VERSION CONTROL

9 FORMS

The applicable forms for this procedure are set out in the following table.

Code	Title	Version

Table 21 Forms

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ANNEX A ACRONYMS, ABBREVIATIONS AND DEFINITIONS



A-1 LIST OF ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition	Description
AWG	American Wire Gauge	Common unit of measure of diameter of wire conductors
BC	Bare Copper	Copper-only conductors, to distinguish from copper coated steel.
BOM	Bill of Material	Equipment Listing for the Works
CCTV	Closed Circuit Television	The system pertaining to video imaging.
CSR	Construction Status Report	A schedule of work showing allocated resources
LSZH	Low Smoke, Zero Halogen	Emits only low levels of smoke and no Halogen when burned according to specific standards.
MEN	Multiple Earth Neutral	Earthing method used in Australia whereby the Protective Earth and Neutral are electrically connected.
NOEW	Notification of Electrical Works	
OHW	Overhead Wiring	1500 Vdc overhead supply used to power rail cars.
OTDR	Optical Time Domain	Reflectometer Electronic tool used to test fibre optic cable.
PVC	Polyvinyl Chloride	Type of plastic used for electrical insulation.
QA	Quality Assurance	Quality Assurance system such as ISO 9001
TC	Tinned Copper	Copper-only conductor with a thin coating of solder
TDR	Time-Domain Reflectometer	Electronic tool used to characterize and locate faults in metallic cables.

Table 22 LIST OF ACRONYMS AND ABBREVIATIONS

A-2 LIST OF DEFINITIONS



The following definitions shall apply throughout this specification and associated Product Installation specifications except where the context clearly indicates otherwise

Term	Definition
Approved	"Approved" or "approved means" or "approval" shall mean approved by or having the approval of the Project Manager for Indra or their appointed representative.
Company's Representative	"Company's Representative" shall mean the Project Manager for Indra or their appointed representative.
Customer Specification	"Customer Specification" are the documents and drawings provided by Indra customer as defined by the Indra purchase order.
Plant	"Plant" refers to items of equipment that do not constitute part of the installation, but are required for the purpose of installation e.g. tools, ladders, mechanical hoist and scaffolding and the like.
Security Fixing	"Security Fixing" is specifically a fixing with a Security Tamper Torx Head (with center pin).
Sub-contractor	"Sub-contractor" shall mean any company or employee of any company that has entered into a contract with Indra for the purpose of carrying out work on behalf of Indra.

Table 23 LIST OF DEFINITIONS

ANNEX B CONTAINMENT AND DUCTING



Containment and Ducting		Comments
Protection from corrosion		All above ground containment, ducting and fixings must be protected from corrosion. In areas close to the sea, containment and duct must be hot dip galvanised
Containment size		Minimum size of 25mm containment is permitted and preference is given to Unistrut and duct in lieu of containment sizes above 32mm. Written approval from the Indra Project Manager is required to use above ground containment greater than 32mm in diameter.
<i>Maximum number of cameras (Fixed, PTZ or Help Points) for containment sizes</i>		
25mm containment	1 camera / HP	Double sided saddles (at maximum 500mm centres) with security screws (Torx) below 3mtrs or where prone to vandalism
32mm containment	3 cameras / HP	
50mm containment	6 cameras / HP	
63mm containment	10 cameras / HP	
<i>Maximum number of cameras for Unistrut and Duct</i>		
41mm x 41mm Unistrut	5 cameras	Fixed every 2 metres by screws or brooker rod. Unistrut is to have U section cover, when installed below 3 metres or where prone to vandalism. The U section is to be secured by stainless straps or ties every 1200mm. Clip on PVC Unistrut lid is suitable for installation above 3 metres or where it's not prone to vandalism.
50mm x 50mm duct	7 cameras	Fixed every 1200mm by screws or brooker rod. Where fixings are greater than 1200mm, Unistrut or additional support maybe required. Duct lid is to be secured by security screws (Torx) or pop riveted when installed below 3 metres or where prone to vandalism.
75mm x 75mm duct	15 cameras	Fixed every 1200mm by screws or brooker rod. Duct lid is to be secured by security screws or pop riveted when installed below 3 metres or where prone to vandalism.
100mm x 100mm duct	40 cameras	Fixed every 1200mm by screws or brooker rod. Duct lid is to be secured by security screws or pop riveted when installed below 3 metres or where prone to vandalism.
Shared services		No other service is to share the CCTV and Help point containment and ducting except with written approval from the Indra Project Manager.
PVC containment		Light duty PVC containment is permitted where installed above 3 metres and where vandalism is not likely. All joins must be securely glued.
Containment saddles		PVC containment must be saddled @ 500mm centres maximum with double sided saddles and suitable fasteners.
Containment colour		All PVC containments must be white in colour (telecommunications) for CCTV cables.
Exposed metal		Exposed thread and cut edges shall be free from grease and cutting compound and protected with galvanised paint.
Sharp edges		All containments and duct must be free from sharp edges, both internally and externally
Workmanship		All containment and duct work is to be installed in an acceptable tradesman like manner. Containments are to be neatly dressed and bent around obstacles. Wherever possible duct and containment should follow the structure and in the most unobtrusive way possible.
Draw line		All containments shall have installed a continuous draw line through the containment secured at both ends of the run.
Junction boxes		Junction boxes and drawing points are to be installed no greater than 8 metres apart, or no more than two 90 degree bends apart whichever is the lesser. Junction boxes or access point must be provided where the containment enters a structure or building.
Fasteners and Fixings		Plastic, nylon or fibre rawl plugs or nail in plugs are not to be used for fixing in to masonry or concrete. Aluminium rawl plugs, loxins and Dynabolts are suitable. Stainless or galvanised screws are to be used in all locations
Containment bends and elbows		Wide radius bends should be used wherever possible to provide ease of cable installation. Use of elbows and sharp bends should be minimised and where unavoidable, a junction box or drawing point must be provided.
Flexible containment		Flexible containment is not to be used except where approved in writing by the Indra Site Supervisor

Table 24 Containment and Ducting

Underground Containments and pits	Comments
Pits	To be installed no greater than 35 metres apart or where the containment run changes direction.
Pit type	ACO Cablemate brand pits (Type 52 or 63) with galvanised checker plate lid with locking screw shall be used.
Pit sealing	Containment entries to pits are to be sealed from water ingress.
Pit finished height	Pits shall be installed so the top of the pit cover is level with the surrounding surface and doesn't present a trip hazard.
Containment identification	All underground containments (excluding ULX) shall be installed in accordance with AS3000 and shall have suitable warning tape installed in the trench at the nominated height above the containment. (the warning tape shall be 'Telecommunication Cable')
Containment colour	All underground PVC containments must be white in colour (telecommunications)
Exposed PVC containment	No part of PVC underground containment is to be exposed. Where exposed, it must be covered by steel containment, a steel shroud or a concrete plinth.

Table 25 Underground Containments and pits

Under Line Crossings (ULX)	Comments
ULX depth	All ULX containments must be installed 2.1 metres below the top of the lowest running rail and must be installed in accordance with the Sydney Trains standards
ULX approval	Approval must be received from the relevant Sydney Trains area Engineer prior to commencement.
ULX containments	Minimum size for ULX containment is 50mm and a spare 50mm containment must be run. Both to have draw lines installed.
ULX warning posts	ULX warning post is to be installed at the location of the ULX on both sides of the rail corridor.
Cables crossing Earth Boundry	Where earthing cabling crosses over the Earth Boundry, the external walls of the building shall be deemed as the earthing boundry.

Table 26 Underground Line Crossings (ULX)

Device	Minimum number of fibre connections required
UPS (network)	2
4 channel video camera card	1
8 channel camera alarm card	1
RS485 Card	2

Table 27 Minimum number of fiber connections required per Device

Note: 1 x 12 Core cable shall be required for up to 16 cameras. A further 3 cores for every 8 cameras shall be required thereafter.

ANNEX C UNDERGROUND (and deemed to be underground) STATIONS

List of Underground Stations
Redfern (ESR platforms and underground passages)
Central (ESR platforms and underground passages)
Town Hall
Wynyard
North Sydney
Circular Quay
St. James
Museum
Martin Place
Kings Cross
Edgecliff
Bondi Junction
Hurstville
Kogarah
Olympic Park
Epping (ECPRL Link Platforms and underground passages)
Chatswood (ECPRL Link Platforms and underground passages)
Delhi Road
Macquarie Park
Macquarie University

Table 28 List of Underground Stations

List of Stations out of the current scope
Green Square Mascot
Domestic Airport
International Airport
Green Square Mascot

Table 29 List of Stations out of the current scope

ANNEX D CONTRACTOR INSTALLATION QA REPORT

Station:

Date:

Contractor Check List Item	N/A	Pass	Fail
Cable Containment System			
Containment runs are not obtrusive			
Containment saddled adequately every 500 mm- min			
Containments sealed against water ingress			
Containment under platform coping edge, does not extend beyond edge			
No flexible between rigid containment			
Protective caps on Unistrut lid secured			
Galvanised containments below 3 meters			
Threads complete into joining glands and junction box			
Exposed threads are protected			
No trip hazards from containment runs			
No sharp edges on containment / brackets			
Unistrut / duct and covers complete and secured against vandalism			
Installation is vandal resistant			
Security fasteners used on containments and brackets			
No PVC to steel containment joints visible			
Chemical anchors used in concrete			
Unistrut / ducting held in 3 places every 2m max			
Fasteners include washers and locknuts			
Halogen free cables used in underground installations			
No metallic containments present inside station buildings			
Any containment entering huts or buildings is coloured white for CCTV.			
White containments used for CCTV cables			
Pits installed level to ground and not a trip hazard			
Pit lid is secured and lockable			
Camera Pole Installation			
Camera pole height 4 meter Minimum (AVS Housing allowed)			
Camera pole drill holes cold galvanised			
Drill holes plugged			
Camera pole vertically aligned			
Concrete plinth finished with a 45 degree chamfer.			
Internal Installation			
The NOEW has been completed (if required)			
Red GPO (10 amp) installed for monitors			
Monitor mounting brackets secure			
Monitor bracket has been modified with locking nut			
Video cable outlet box for monitor installed including cable grommet			
Video cable terminated with BNC connector			

IAD-WIS-10-001: Standard Cabling and Containment Work Instruction for Sydney Trains / Version: No 2

Contractor Check List Item	N/A	Pass	Fail
Keyboard RJ-12 installed & labelled			
Keyboard installed and tested			
Video & keyboard outlets labelled			
Camera Installation Check List			
All camera positions checked for best positions against vandals (max - height)			
The best housing installed for the application			
Camera housing complete with sun shroud where exposed			
All camera housings are free of water			
Camera housings are labelled			
Camera housings are securely mounted			
Housing lenses are clean and free from bugs			
Any holes in the housing plugged			
All cameras supplying video to the switcher			
All cameras are supplying colour images			
All cameras have been tested in accordance with TIS0175-26			
Monitors are receiving stable video			
Verify camera alarm to the monitor			
Rack Installation Check List			
Wiring neat and secure			
Rack is positioned in accordance with the drawing			
Main Blue anaconda is securely attached to rack and ceiling			
All cables are labelled			
All power packs to net gear secured (cable tied)			
Station Condition After Install Work			
No damage to plaster or brick work			
No damage to corbels on brick work			
No damage to sealing around containments			
No building alterations			
No heritage damage			
No Galv spray on brick work			
All refuse and waste removed			
No equipment damage			
Station Master has no complaints or damage to report			
General Check List			
All as builts have been updated			
All relevant reports have been completed			
All night focuses have been confirmed as OK			
Installation is ready for hand over to Indra.			
Verified station is operational with Help Desk			
QA Report sent to Indra.			
Camera report sheet completed.			

Table 30 Containment and Ducting

ANNEX E R&M Installation and Testing Guideline

ANNEX F ITP Station Inspection and Test Plan

Site inspected by:

A duly authorised representative of:

(Contractor)

Signature: _____

Designation:
Contact Number:

On this the _____ Day of _____ 20

Documentation accepted on behalf of Indra

Signature: _____

Name:

Designation:

Contact Number:

On this the _____ Day of _____ 20

Schedule C2. Tender Design

(Clauses 1.1, 5.1, 5.2)



Sydney Metro City & Southwest

Sydney Yard Access Bridge Project Contract Schedules

Schedule C2

Tender Design

PROJECT	Sydney Metro City & Southwest	DATE	18 January 2017
GROUP	Sydney Metro City & Southwest	STATUS	Execution Version
AUTHOR	Transport for NSW	REVISION	
COMPANY	Transport for NSW	FILE NUMBER	
FILE NAME	SYAB Schedule C2 Tender Design		

Contents

1	Tender Design	1
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1 Tender Design

- (a) This Schedule C2 contains the Tender Design which consists of the drawings listed in Table 1 and contained in Attachment 1 to this Schedule C2 ("**Tender Design Drawings**"), and as amended in accordance with the amendments and requirements identified in Table 2 to this to this Schedule C2.
- (b) The amendments and requirements in Table 2 are not exhaustive and the Principal does not warrant that:
 - (i) it has checked the relevant documents for compliance with the requirements of the Contract; or
 - (ii) compliance with the requirements in Table 2 will ensure that the Contractor fulfils all the Contract requirements.
- (c) The Contractor is required to adopt and make the amendments referred to in Table 2 and such adoption and amendments will not in any way limit the warranty given by the Contractor under clause 5.2 of the General Conditions, including that the Tender Design included in this Schedule C2 has been prepared by the Contractor and will be fit for its intended purpose.

Table 1 – Tender Design Drawings

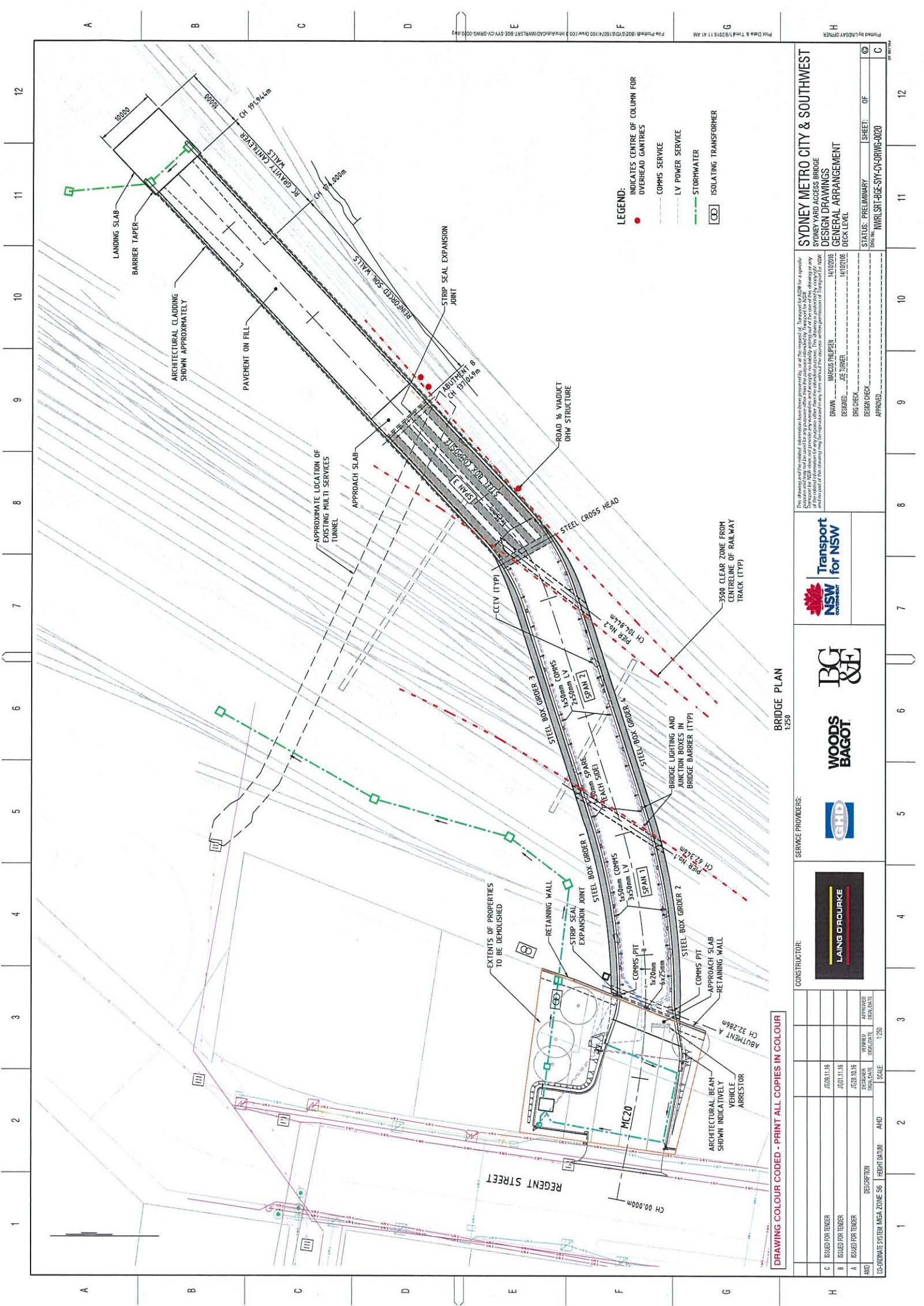
Drawing Number	Drawing Revision	Drawing Title
NWRLSRT-BGE-SYY-CV-DRWG-0020	C	General Arrangement: Deck Level
NWRLSRT-BGE-SYY-CV-DRWG-0030	C	General Arrangement: Ground Level
NWRLSRT-GHD-SYY-CV-DRWG-0050	A	Architectural Layouts: Elevations (1 of 2)
NWRLSRT-GHD-SYY-CV-DRWG-0051	A	Architectural Layouts: Elevations (2 of 2)
NWRLSRT-GHD-SYY-CV-DRWG-0052	A	Architectural Layouts: Pile to Track Proximity
NWRLSRT-GHD-SYY-CV-DRWG-0053	A	Architectural Layouts: Bridge to Track Proximity
NWRLSRT-BGE-SYY-CV-DRWG-0060	C	SYAB Deck: Cross Sections
NWRLSRT-BGE-SYY-CV-DRWG-0070	D	Horizontal and Vertical Alignment: Plan and Longitudinal Section – Sheet 1
NWRLSRT-BGE-SYY-CV-DRWG-0071	D	Horizontal and Vertical Alignment: Plan and Longitudinal Section – Sheet 2
NWRLSRT-BGE-SYY-CV-DRWG-0080	B	Circulation Swept Paths: 12.5m Rigid Truck
NWRLSRT-BGE-SYY-CV-DRWG-0081	B	Circulation Swept Paths: 19m Semi-trailer Truck
NWRLSRT-BGE-SYY-CV-DRWG-0082	B	Circulation Swept Paths: 25m Low Loader Truck
NWRLSRT-BGE-SYY-CV-DRWG-0083	B	Circulation Swept Paths: 12.5m Rigid Truck
NWRLSRT-BGE-SYY-CV-DRWG-0084	D	Circulation Swept Paths: 12.5m – 19m Truck
NWRLSRT-BGE-SYY-CV-DRWG-0085	D	Circulation Swept Paths: 25m Truck
NWRLSRT-BGE-SYY-CV-DRWG-0090	C	SYAB Structural Details: Cross Sections (1 of 2)
NWRLSRT-BGE-SYY-CV-DRWG-0091	C	SYAB Structural Details: Cross Sections (1 of 2)

Table 2 – Amendments to, and Requirements for, the Tender Design Drawings

Item	Amendments to, and Requirements for, the Tender Design Drawings
1.	Notwithstanding any structural details, including concrete grades, reinforcement details or rates, shown in the Tender Design Drawings all structural design must comply with the requirements of the Contract, including durability requirements and relevant Codes and Standards.
2.	All pile founding levels and assumptions shown in the Tender Design Drawings are indicative only and final levels and assumptions must be determined during detailed design.
3.	<p>The minimum requirement for the materials to be provided is as per the Attachment 2 to Schedule C2.</p> <p>The 3.30m boundary fence between Regent Street and the rail boundary is required to be a 3.030m palisade fence Code RE26 rather than the "Secureamesh" Code FS2624 noted in Attachment 2.</p>
4.	A detention basin with a minimum volume of 15m ³ is required.
5.	A pedestrian warning system is required to warn pedestrians of vehicles leaving the SYAB site.
6.	A padmount isolation transformer for Sydney Trains 415v supply is required to be located close to the bridge.
7.	The road surface of the bridge is to be illuminated using multiple LED low-level recessed wall lighting.
8.	The Regent Street entrance is to be illuminated using multiple dual head LED lights on poles at or near the Regent Street boundary.

Attachment 1

Tender Design Drawings



- LEGEND:**
- INDICATES CENTRE OF COLUMN FOR OVERHEAD GANTRIES
 - COMMS SERVICE
 - LV POWER SERVICE
 - STORMWATER
 - ISOLATING TRANSFORMER

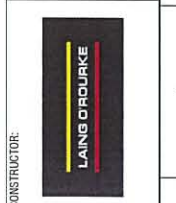
SYDNEY METRO CITY & SOUTHWEST
 SYDNEY YARD ACCESS BRIDGE
 DESIGN DRAWINGS
 GENERAL ARRANGEMENT
 DECK LEVEL

STATUS: PRELIMINARY SHEET: OF
 DWG No: MWRL-SMT-BGE-SY-CV-DRWG-0020

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DESIGNED: JAC THORNTON
 DRAWN: MARCUS PHILIPSEN
 DATE: 14/10/2016
 DESIGNED: JAC THORNTON
 DATE: 14/10/2016

DESIGN CHECK: APPROVED
 DRS CHECK: APPROVED



BRIDGE PLAN
1:250

CONSTRUCTOR: LAING O'DRISCOLL

SERVICE PROVIDERS:

NO	ISSUED FOR TENDER	DATE	DESCRIPTION	SCALE	HEBHT DATE/AMOUNT
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B	ISSUED FOR TENDER	J10/11/16			
A	ISSUED FOR TENDER	J10/21/16			

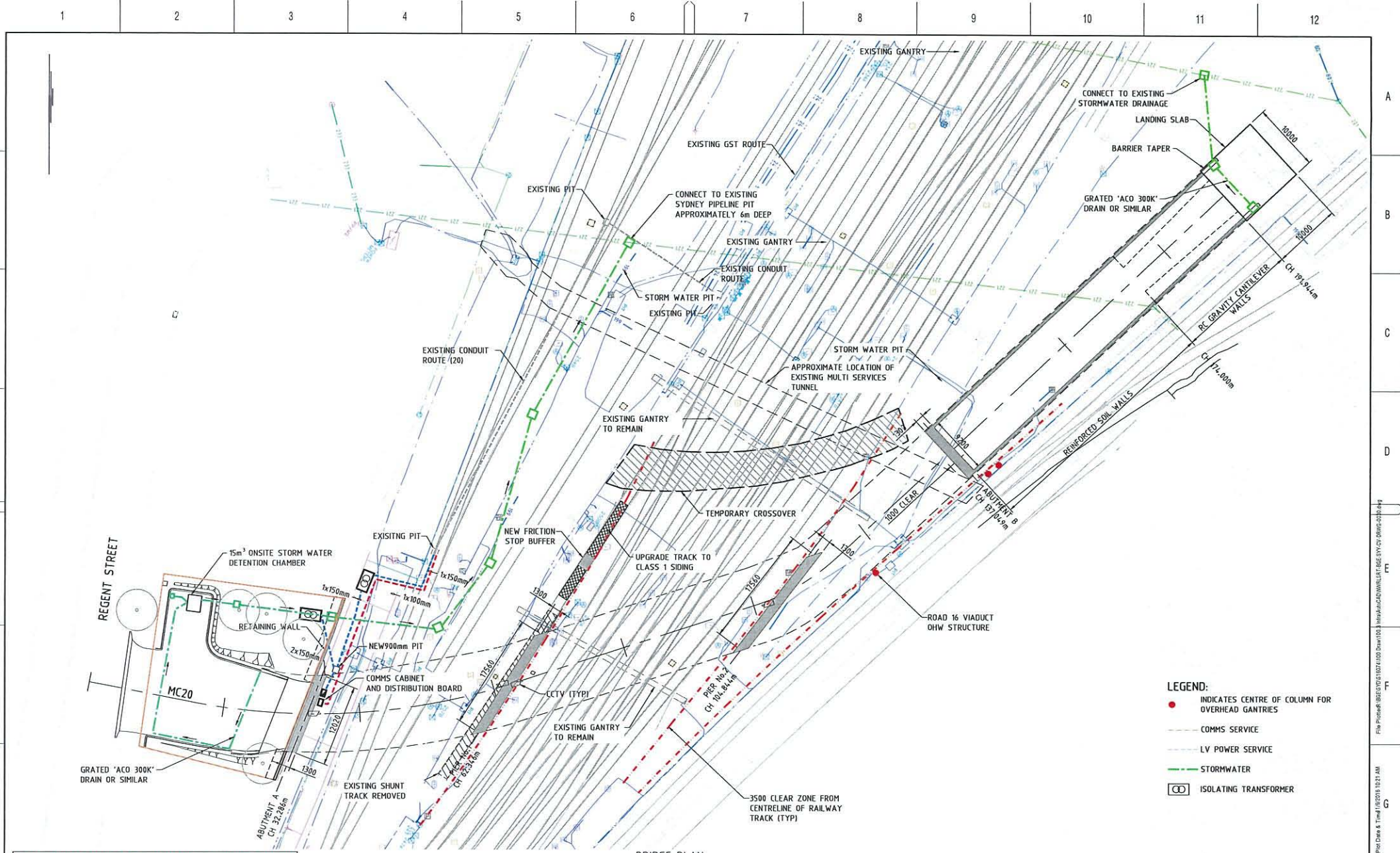
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 SCALE: 1:250

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1 2 3 4 5 6 7 8 9 10 11 12

A B C D E F G H

Printed by LINCOLN OFFICE



- LEGEND:**
- INDICATES CENTRE OF COLUMN FOR OVERHEAD GANTRIES
 - COMMS SERVICE
 - LV POWER SERVICE
 - STORMWATER
 - ISOLATING TRANSFORMER

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

BRIDGE PLAN
SCALE 1:250

CO-ORDINATE SYSTEM: MGA ZONE 56	HEIGHT DATUM: AHD	SCALE: 1:250
DESIGNER: JT/09.11.16	VERIFIED: JT/01.11.16	APPROVED: JT/28.10.16
DESCRIPTION	DESIGNER	VERIFIED
	DATE	DATE

CONSTRUCTOR:

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DRAWN	LINDSAY OFFNER	14/10/2016
DESIGNED	JOE TURNER	14/10/2016
DRG CHECK		
DESIGN CHECK		
APPROVED		

SYDNEY METRO CITY & SOUTHWEST
 SYDNEY YARD ACCESS BRIDGE
 DESIGN DRAWINGS
 GENERAL ARRANGEMENT
 GROUND LEVEL

STATUS: PRELIMINARY SHEET: OF
 DWG No: NWRLSRT-BGE-SYY-CV-DRWG-0030

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 Print Date & Time: 18/02/2016 10:31 AM
 Plotted by: LINDSAY OFFNER

A

B

C

BASE ELEVATION SOUTH - EAST
SCALE 1 : 100

D

E

F

BASE ELEVATION SOUTH - WEST
SCALE 1 : 100

G

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A		ISSUE FOR TENDER		01/11/16	VERIFIED	APPROVED
REV	DESCRIPTION	DATE	DESIGNER SIGNATURE	DATE	VERIFIED	APPROVED
CO-ORDINATE SYSTEM: MGA ZONE 55		HEIGHT DATUM: A.M.D.		SCALE: 1 : 100		

CONSTRUCTOR

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DESIGNER	MITCHELL PUNGH
DESIGNED BY	NEL HILL
DESIGN CHECK	
DESIGN CHECK	
APPROVED	

SYDNEY METRO CITY & SOUTHWEST
SYDNEY YARD ACCESS BRIDGE
DESIGN DRAWINGS
ARCHITECTURAL LAYOUTS
ELEVATIONS

STATUS: PRELIMINARY	1	OF	2	©
DRG No:	NWRLSRT-GHD-SYY-CV-DRWG-0050			

FINISHES SCHEDULE - BASE OPTION		
CODE	DESCRIPTION	LOCATION
BAL1	SCREENS STANCHIONS	BRIDGE STANCHIONS & RAILS
CON1	BASE CONCRETE CRASH BARRIER	ROAD CRASH BARRIERS
CON2	BASE CONCRETE - REFER REFERENCE DESIGN FINISHES	ALL ABUTMENTS & PIERS
PNT1	PAINTED STEEL FINISH	EDGE BEAM CLADDING
SCR2	SCREENS	BRIDGE

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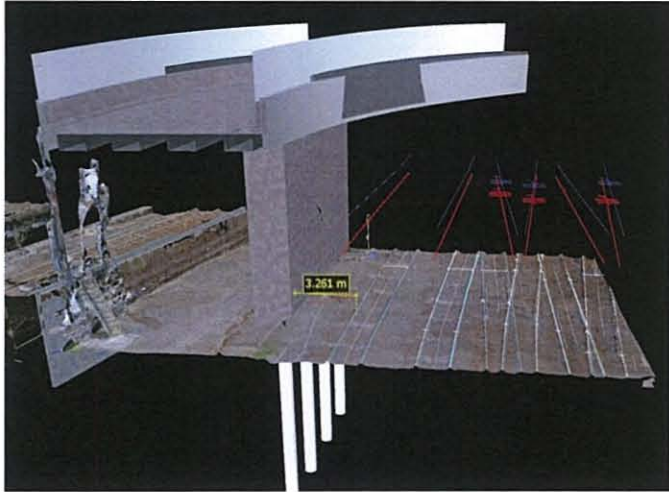
B



C

SECTION PIER TWO TRACK PROXIMITY ASSESSMENT
SCALE 1 : 100

D



PIER 2 - CLOSEST TRACK APPROX DIMENSION

E

F

G

TRACK PROXIMITY ASSESSMENT
SCALE 1 : 500

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

REV	DESCRIPTION	DATE	DESIGNED	CHECKED	APPROVED	
A	ISSUE FOR TENDER	08.11.16	DESKRUK	DESKRUK	DESKRUK	
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SERVICE PROVIDERS

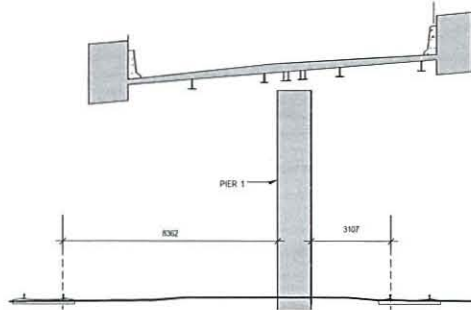


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 CHECKED: JOE TURNER
 DESIG CHECK:
 DESIGN CHECK:
 APPROVED:

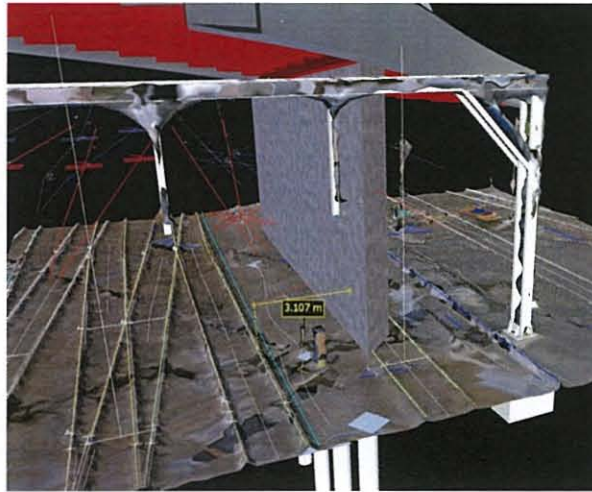
SYDNEY METRO CITY & SOUTHWEST
 SYDNEY YARD ACCESS BRIDGE
 DESIGN DRAWINGS
 ARCHITECTURAL LAYOUTS
 PILE TO TRACK PROXIMITY

STATUS: PRELIMINARY 1 OF 1
 DESG No: NWRLSRT-GHD-SYY-CV-DRWG-0052

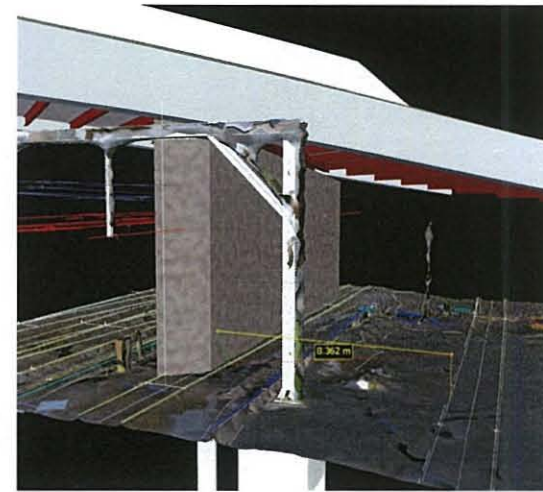


NOTE: SECTION SHOWING PIER 1 LOOKING NORTH SECTION CUT AT THE NORTHERN EDGE OF THE PIER, DIMENSIONS MAY VARY OVER THE PIER LENGTH

SECTION - PIER ONE TRACK PROXIMITY ASSESSMENT
SCALE 1 : 100



PIER 1 - CLOSEST TRACK APPROX DIMENSION



A

B

C

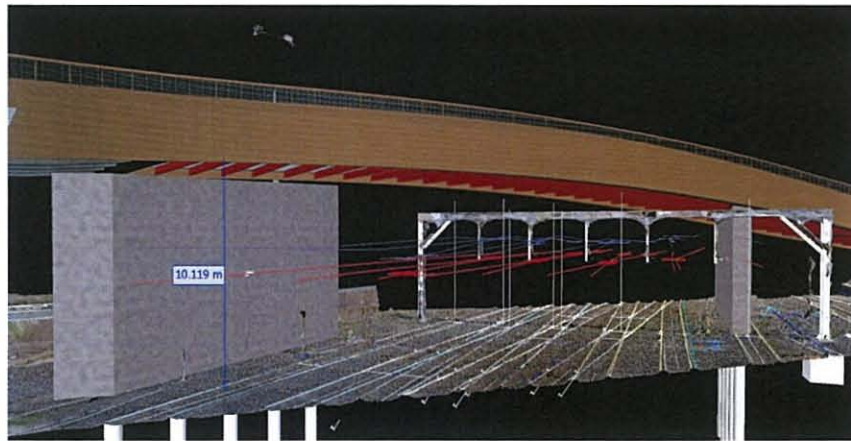
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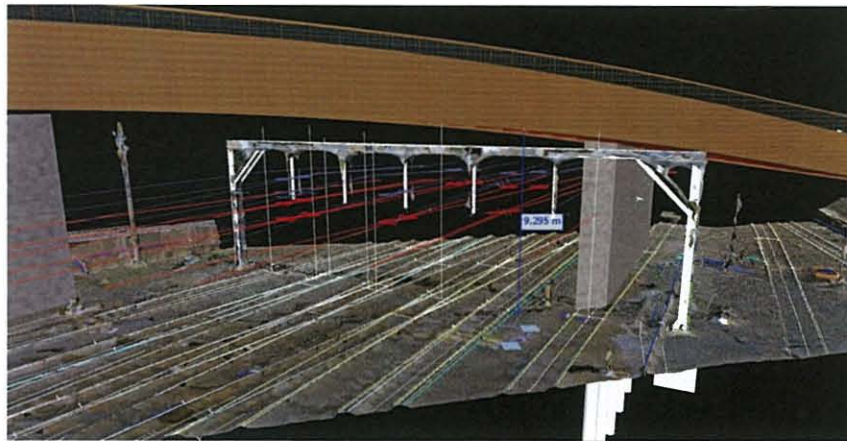
F

G

A



BRIDGE NORTH ELEVATION (EAST TRACKS) - APPROX CLEARANCE 10.120 M TRACK TO BRIDGE BEAM

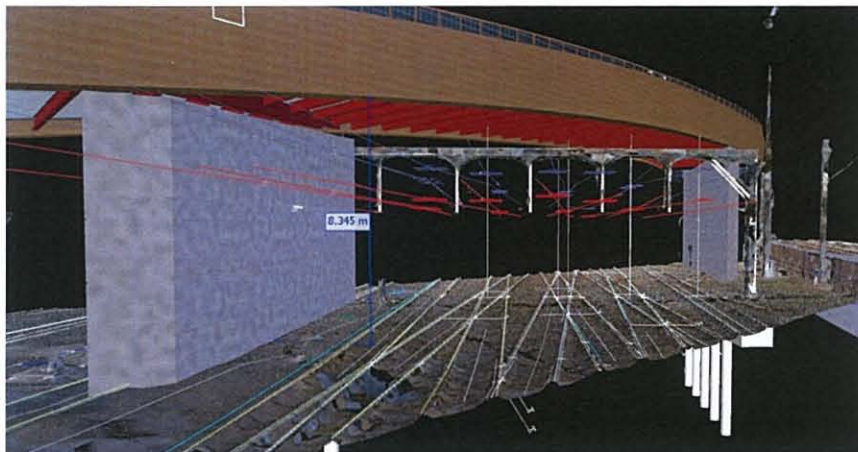


BRIDGE NORTH ELEVATION (WEST TRACKS) - APPROX CLEARANCE 9.295 M TRACK TO BRIDGE BEAM

B

C

D



BRIDGE SOUTH ELEVATION (WEST TRACKS) - APPROX CLEARANCE 8.345 M TRACK TO BRIDGE BEAM



BRIDGE SOUTH ELEVATION (EAST TRACKS) - APPROX CLEARANCE 10.245 M TRACK TO BRIDGE BEAM

E

F

G

TRACK PROXIMITY ASSESSMENT - HEIGHT CLEARANCE
SCALE 1 : 500

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NO.	ISSUE FOR TENDER	DESCRIPTION	DATE	DESIGNER	DATE	APPROVED	DATE
A	ISSUE FOR TENDER		08.11.16				
REL							

CO-ORDINATE SYSTEM: MGA ZONE 55 | HEIGHT DATUM: A.M.D. | SCALE: 1 : 500

CONSTRUCTOR

SERVICE PROVIDERS

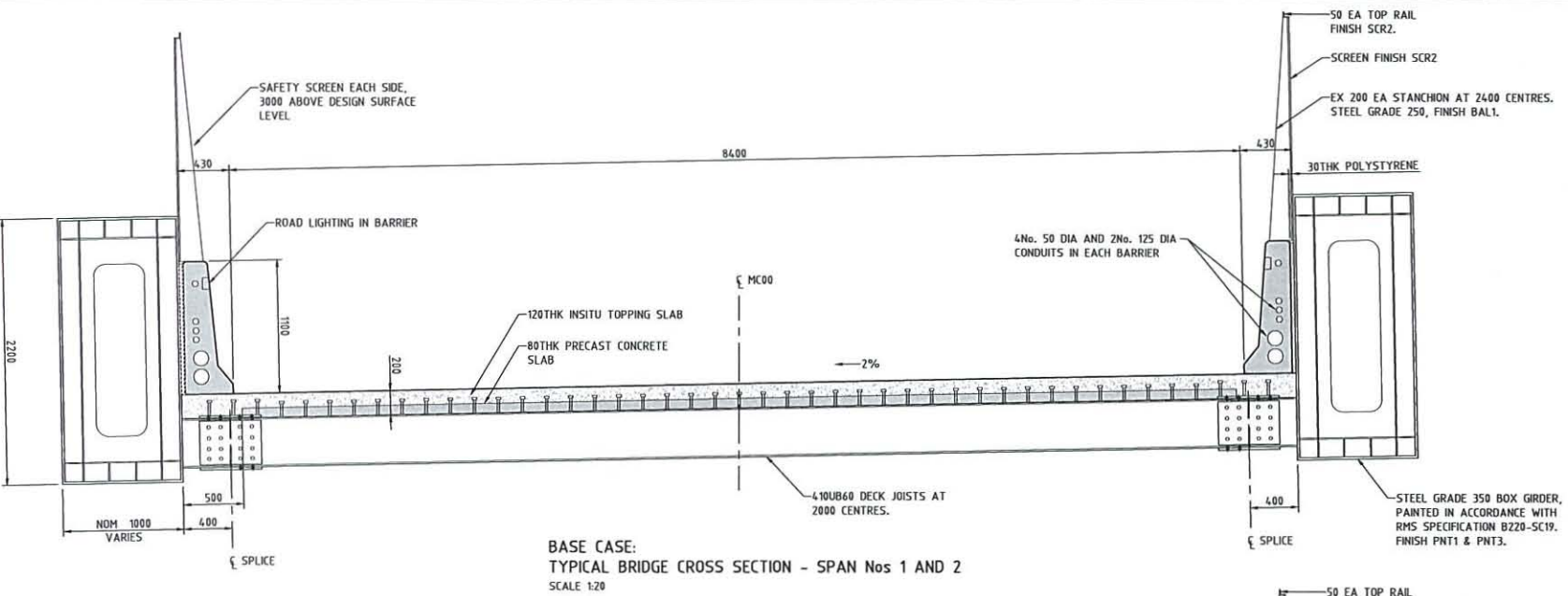
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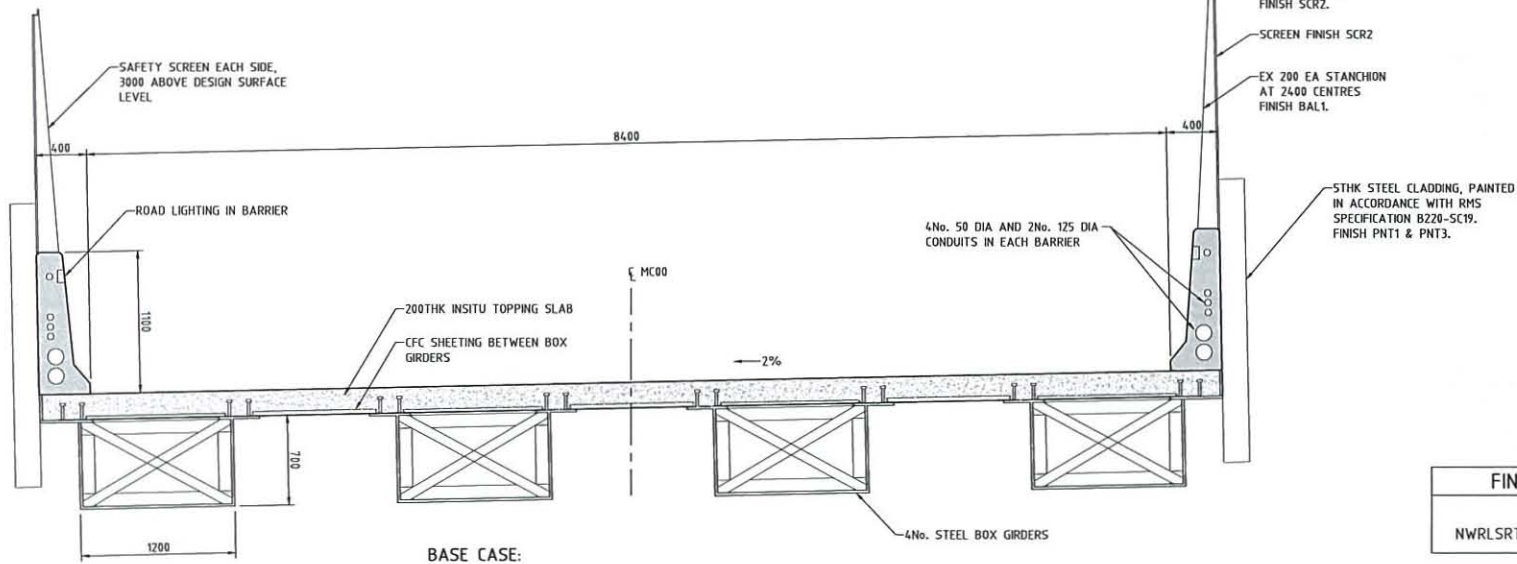
DESIGNER: _____ MITCHELL PUGH
 CHECKER: _____ JOE TURNER
 DESIGN CHECK: _____
 APPROVED: _____

SYDNEY METRO CITY & SOUTHWEST
 SYDNEY YARD ACCESS BRIDGE
 DESIGN DRAWINGS
 ARCHITECTURAL LAYOUTS
 BRIDGE TO TRACK PROXIMITY

STATUS: PRELIMINARY | 1 OF 1 | ©
 DRG No: NWRLSRT-GHD-SYY-CV-DRWG-0053 | A



BASE CASE:
TYPICAL BRIDGE CROSS SECTION - SPAN Nos 1 AND 2
SCALE 1:20



BASE CASE:
TYPICAL BRIDGE CROSS SECTION - SPAN No.3
SCALE 1:20

FINISHES SCHEDULE	
REFER DRG NWRLSRT-GHD-SYY-CV-DRWG-0051	

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

CO-ORDINATE SYSTEM	MGA ZONE	HEIGHT DATUM	AHD	SCALE
	56			1:20

CONSTRUCTOR:	SERVICE PROVIDERS:
LAING O'ROURKE	GHD, WOODS BAGOT, BG & E

NO.	DESCRIPTION	DESIGNER	ISSUED DATE	VERIFIED	APPROVED	ISSUE DATE
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B	ISSUED FOR TENDER	JT	04.11.16			
A	ISSUED FOR TENDER	JT	28.10.16			

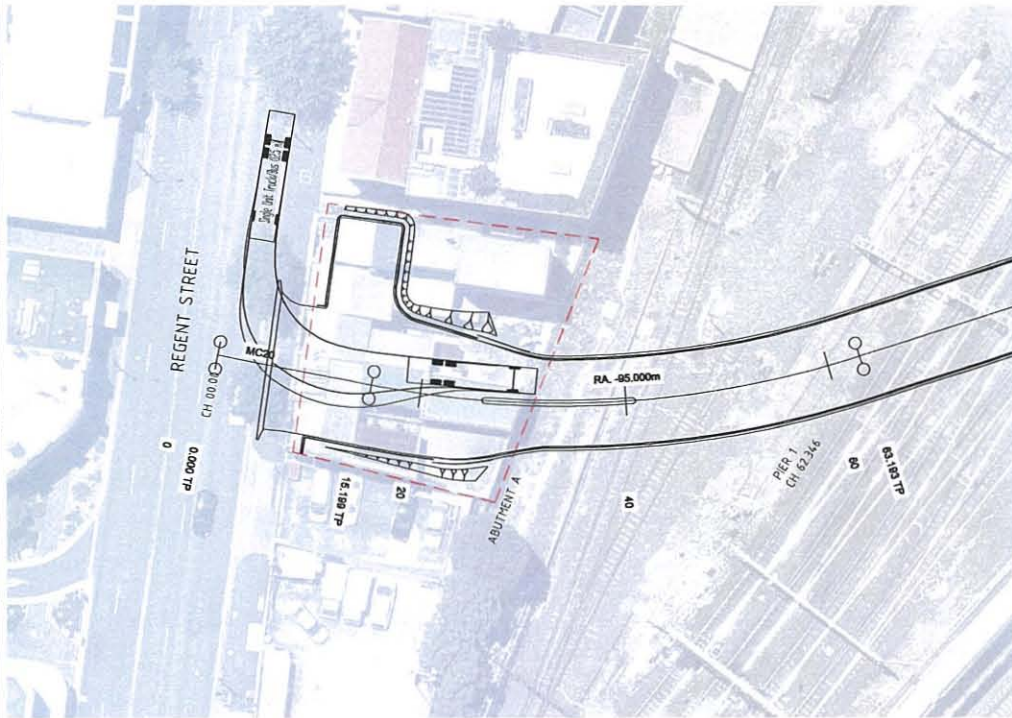


NSW GOVERNMENT Transport for NSW

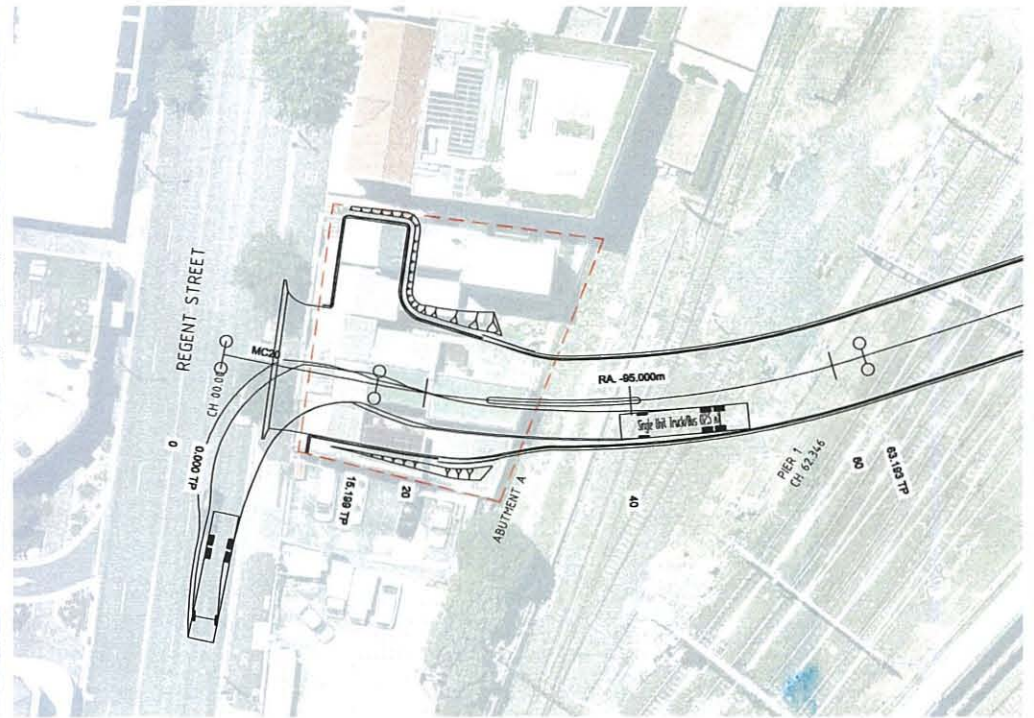
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DRAWN	LINDAY O'RIEN	14/10/2016
DESIGNED	JOE TURNER	14/10/2016
DRG CHECK		
DESIGN CHECK		
APPROVED		

SYDNEY METRO CITY & SOUTHWEST	
SYDNEY YARD ACCESS BRIDGE	
DESIGN DRAWINGS	
SYAB DECK	
CROSS SECTIONS	
STATUS: PRELIMINARY	SHEET: 1 OF 1
DRG No: NWRLSRT-BGE-SYY-CV-DRWG-0060	



12.5m RIGID TRUCK SWEEP PATH - IN
SCALE 1:250



12.5m RIGID TRUCK SWEEP PATH - OUT
SCALE 1:250

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

NO	DESCRIPTION	DESIGNER SIGN/DATE	VERIFIED SIGN/DATE	APPROVED SIGN/DATE
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A	ISSUED FOR TENDER	AH / 31.10.16		
AMD				
COORDINATE SYSTEM:		HEIGHT DATUM:		SCALE: 1:250

CONSTRUCTOR:

SERVICE PROVIDERS:

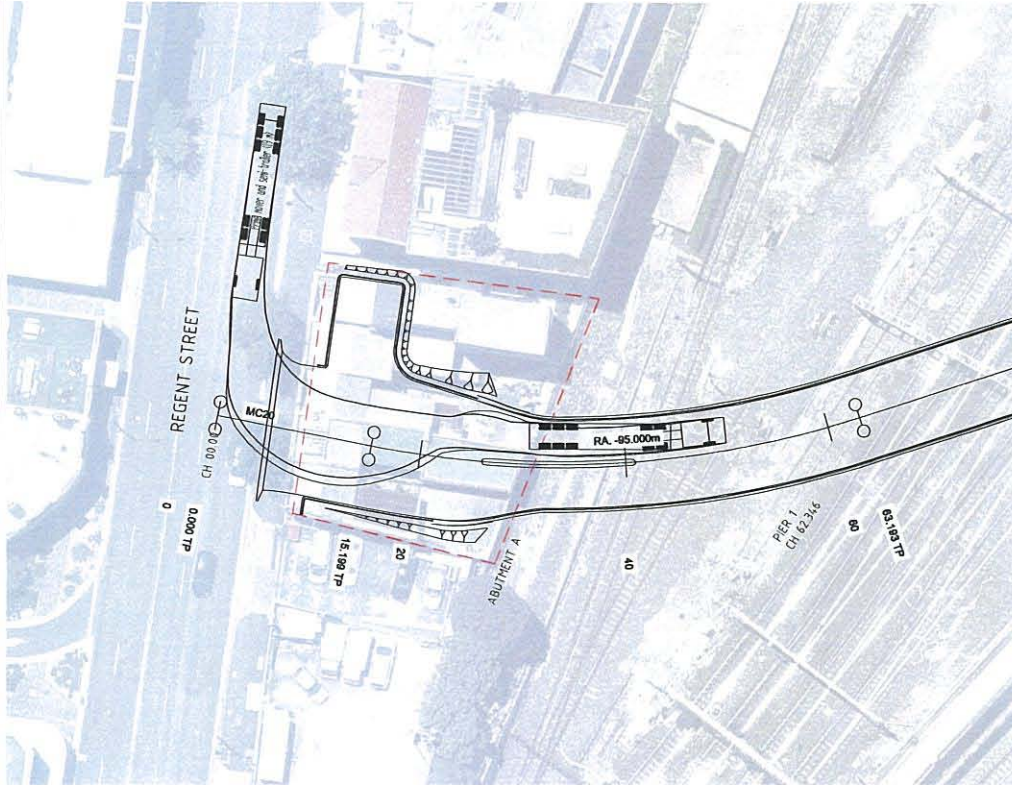
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DRAWN	MP	27/09/16
DESIGNED	AH	27/09/16
DRG CHECK		
CHECK CHECK		
APPROVED		

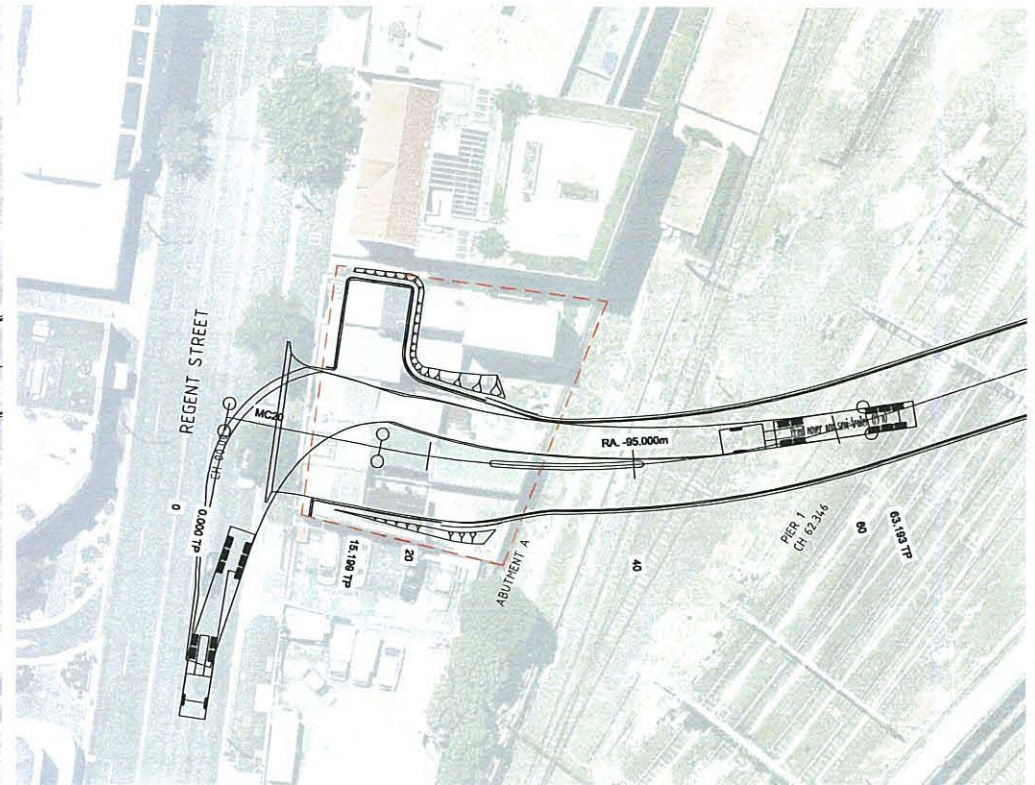
SYDNEY METRO CITY & SOUTHWEST
 SYDNEY YARD ACCESS BRIDGE
 DESIGN DRAWINGS
 CIRCULATION SWEEP PATHS
 12.5m RIGID TRUCK

STATUS: PRELIMINARY	SHEET: 1 OF 7
DRG NO: NWRLSRT-BGE-SY-CV-DRWG-0000	

File Name: P:\BGE\0510271165 Draw 1003 12.5m RIGID TRUCK SWEEP PATHS.dwg
 Plot Date & Time: 11/02/2016 8:04 PM
 Plotted by: ANDREW JASPER



19m SEMI-TRAILER TRUCK SWEEP PATH - IN
SCALE 1:250



19m SEMI-TRAILER TRUCK SWEEP PATH - OUT
SCALE 1:250

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

B	ISSUED FOR TENDER	AH/04.11.16		
A	ISSUED FOR TENDER	AH/31.10.16		
AMD	DESCRIPTION	DESIGNER SIGN/DATE	VERIFIED SIGN/DATE	APPROVED SIGN/DATE
COORDINATE SYSTEM:		HEIGHT DATUM:	SCALE:	1:250

CONSTRUCTOR:



SERVICE PROVIDERS:



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DRAWN	MP	27/09/16
DESIGNED	AH	27/09/16
DRG CHECK		
DESIGN CHECK		
APPROVED		

SYDNEY METRO CITY & SOUTHWEST
SYDNEY YARD ACCESS BRIDGE
DESIGN DRAWINGS
CIRCULATION SWEEP PATHS
19m SEMI-TRAILER TRUCK

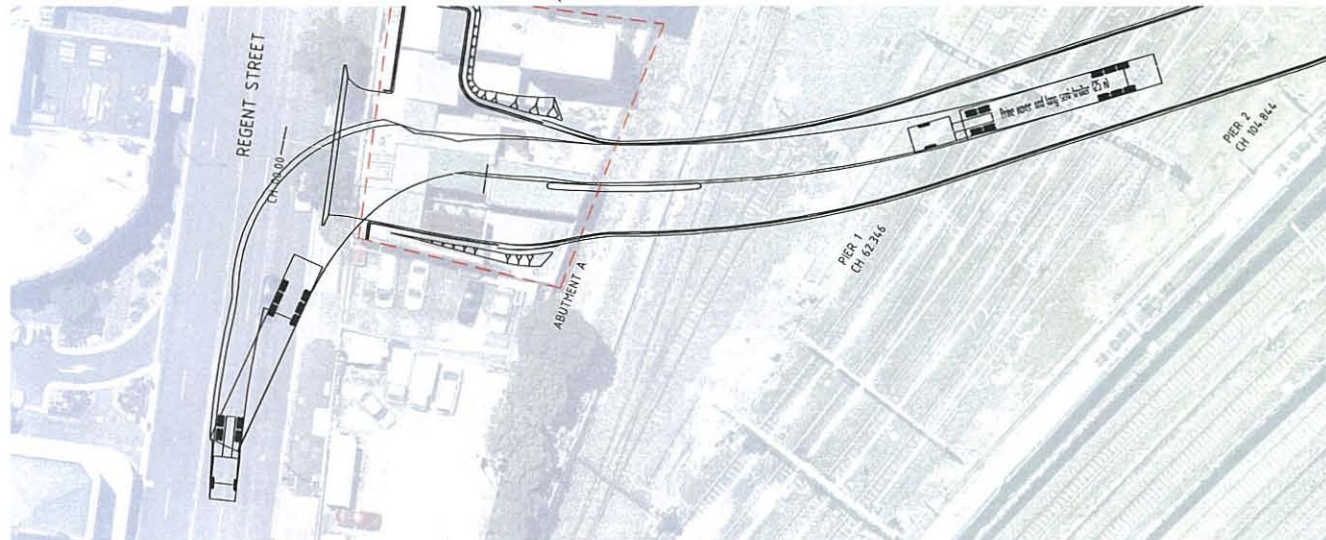
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 Plotted by: ANDREW JARROLD



25m LOW LOADER TRUCK SWEEP PATH - IN

SCALE 1:100



25m LOW LOADER TRUCK SWEEP PATH - OUT

SCALE 1:250

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

NO.	ISSUED FOR TENDER	DATE	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
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A	ISSUED FOR TENDER	16/11/2016	AH/31.10.16		
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CO-ORDINATE SYSTEM:	HEIGHT DATUM:	SCALE:	1:250		



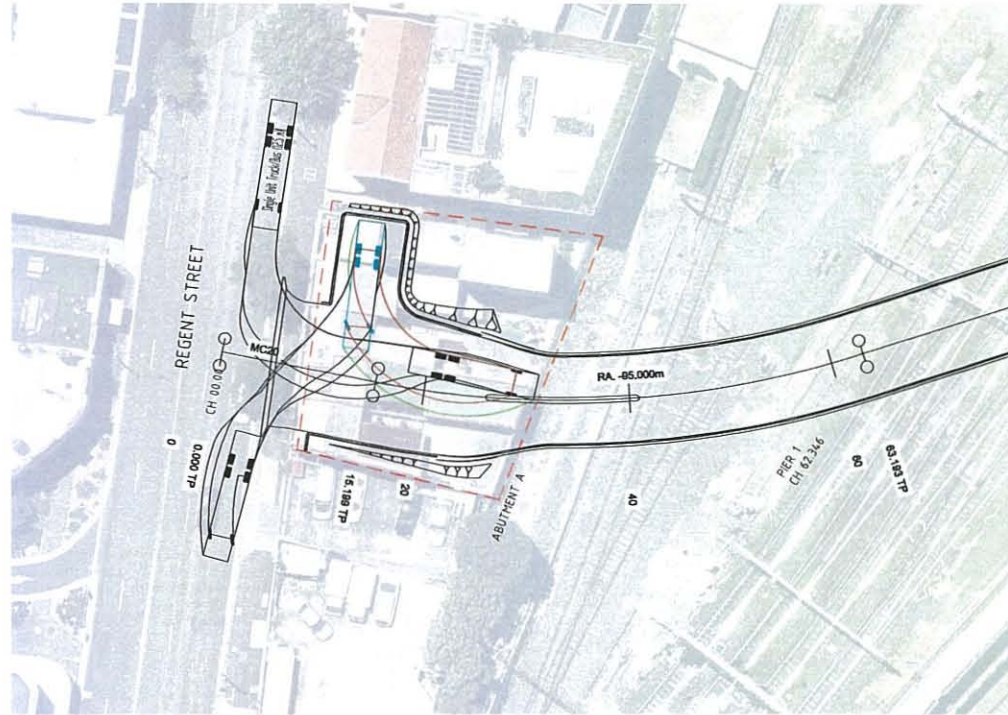
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DRAWN	MP	27/09/16
DESIGNED	AH	27/09/16
DRG CHECK		
DESIGN CHECK		
APPROVED		

SYDNEY METRO CITY & SOUTHWEST
 SYDNEY YARD ACCESS BRIDGE
 DESIGN DRAWINGS
 CIRCULATION SWEEP PATHS
 25m LOW LOADER TRUCK






STATUS: PRELIMINARY	SHEET: 3 OF 7
DRG NO: NWRLSRT-BGE-SYY-CV-DRWG-0082	

File Name: I:\projects\metro\0071102\Draw\102_Design\Drawings\CV\DRWG-0082.dwg
 Plot Date & Time: 11/12/2016 4:03 PM
 Plotted by: JACOBEN JACOBSON



12.5m RIGID TRUCK SWEEP PATH - TURN AROUND (FORWARD IN)
SCALE: 1:250

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

CONSTRUCTOR:		SERVICE PROVIDERS:	
		   	
B	ISSUED FOR TENDER	AN/04/17/16	
A	ISSUED FOR TENDER	AN/31/17/16	
AMD	DESCRIPTION	DESIGNER SIGN/DATE	VERIFIED SIGN/DATE
CO-ORDINATE SYSTEM:	HEIGHT DATUM:	SCALE:	1:250



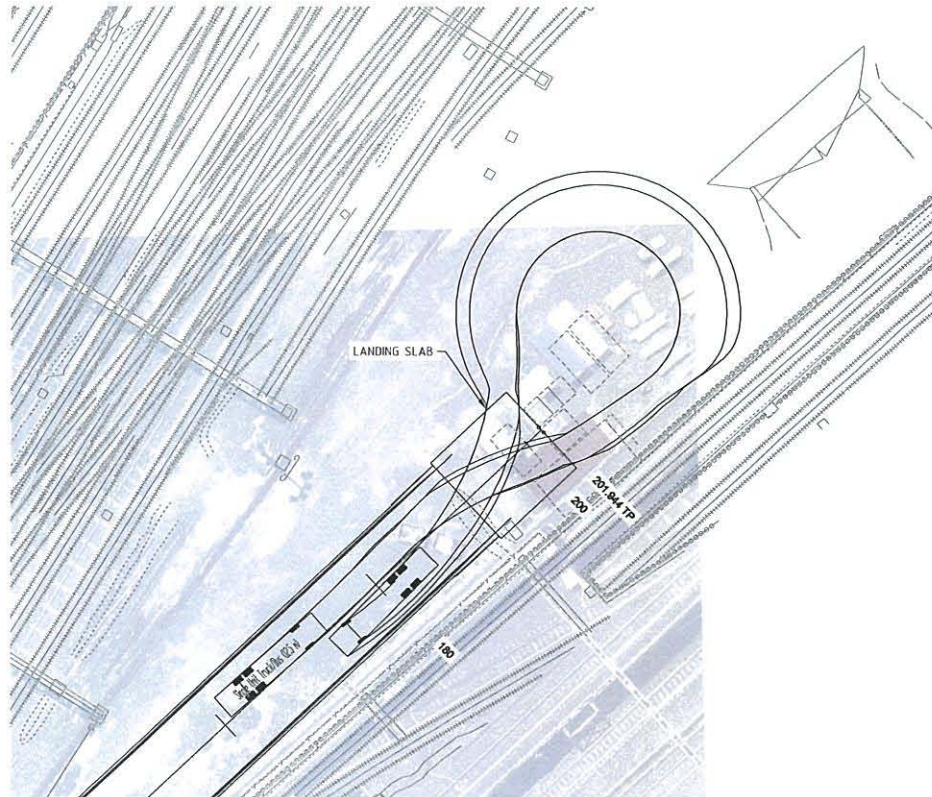
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DRAWN	LO	14/02/2016
DESIGNED	AH	14/02/2016
DRG CHECK		
DESIGN CHECK		
APPROVED		

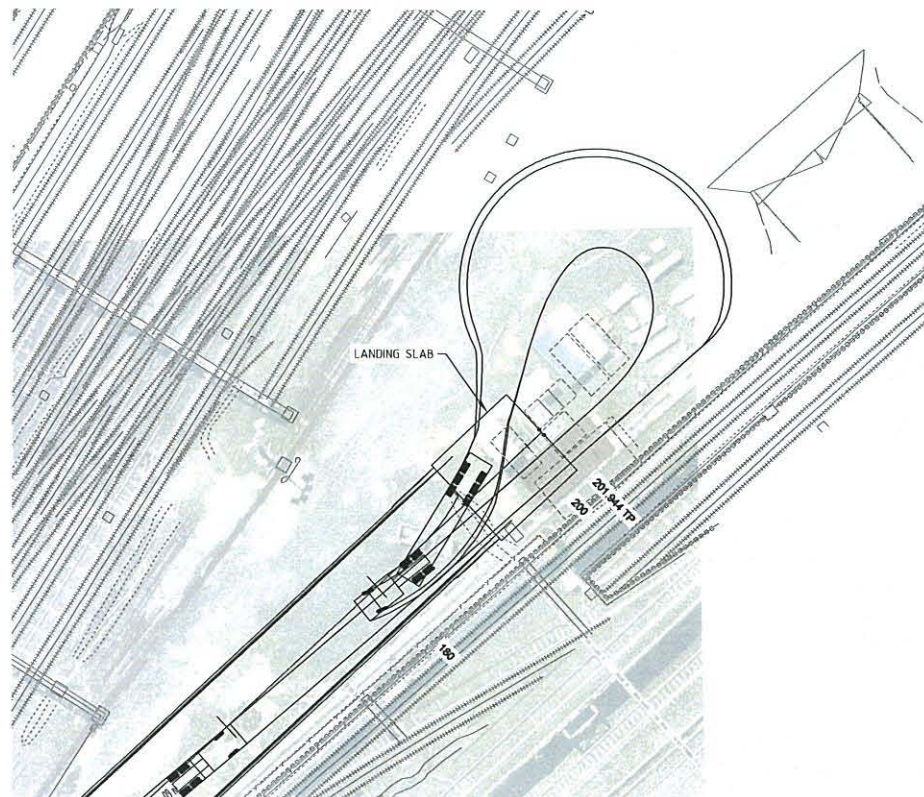
SYDNEY METRO CITY & SOUTHWEST	
SYDNEY YARD ACCESS BRIDGE	
DESIGN DRAWINGS	
CIRCULATION SWEEP PATHS	
12.5m RIGID TRUCK	
STATUS: PRELIMINARY	SHEET: 4 OF 7
DRG No. NWRLSRT-BGE-SYY-CV-DRWG-0083	

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Printed: 14/02/2016 4:11 PM
By: ANDREW HARRIS



12.5m TRUCK SWEEP PATH - TURN AROUND
SCALE: 1:250



19.0m TRUCK SWEEP PATH - TURN AROUND
SCALE: 1:250

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

D	ISSUED FOR INFORMATION	AH / 08.11.16		
C	ISSUED FOR INFORMATION	AH / 08.11.16		
B	ISSUED FOR INFORMATION	AH / 04.11.16		
A	ISSUED FOR INFORMATION	AH / 31.10.16		
AMD	DESIGNER	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
CD-COORDINATE SYSTEM:		HEIGHT DATUM:	SCALE:	1:250

CONSTRUCTOR:



SERVICE PROVIDERS:



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DRAWN	LD	14/10/2016
DESIGNED	AH	14/10/2016
DRG CHECK		
DESIGN CHECK		
APPROVED		

SYDNEY METRO CITY & SOUTHWEST
SYDNEY YARD ACCESS BRIDGE
DESIGN DRAWINGS
CIRCULATION SWEEP PATHS
12.5m - 19.0m TRUCK

STATUS: PRELIMINARY SHEET: 5 OF 7
DRG No: NWRLSRT-86E-SYY-CV-DRWG-0084

Prepared by: ANDREW HARRIS

File Name: P:\86E\86E10274\103\Drawings\12.5m\12.5m_Sweep_Path_CV_DWG.dwg

01/10/16

1 2 3 4 5 6 7 8 9 10 11 12

A

B

C

D

E

F

G

A

B

C

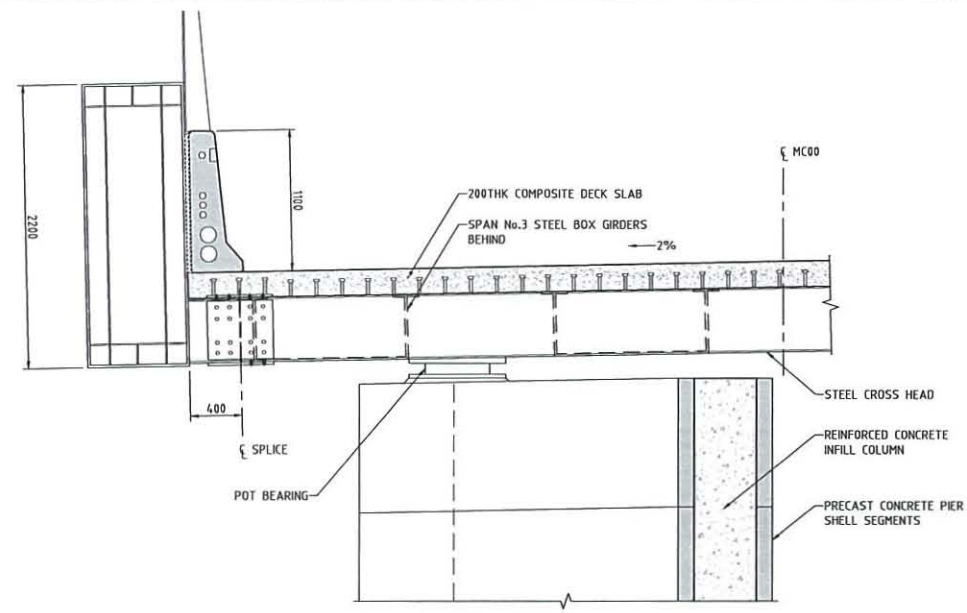
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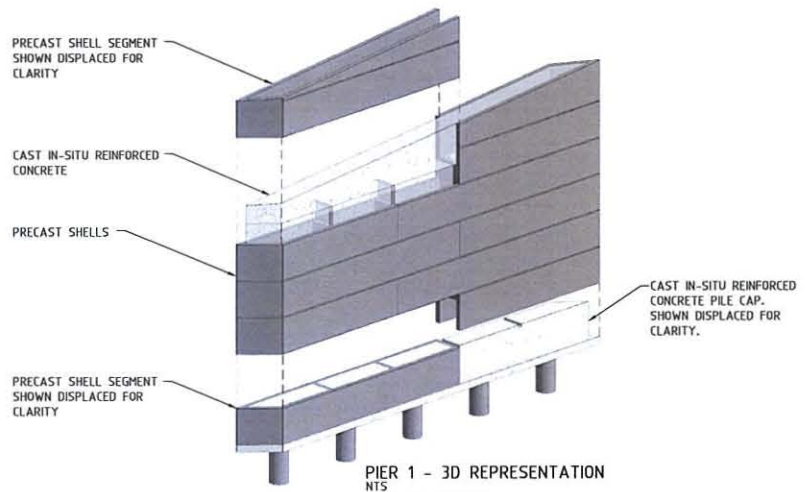
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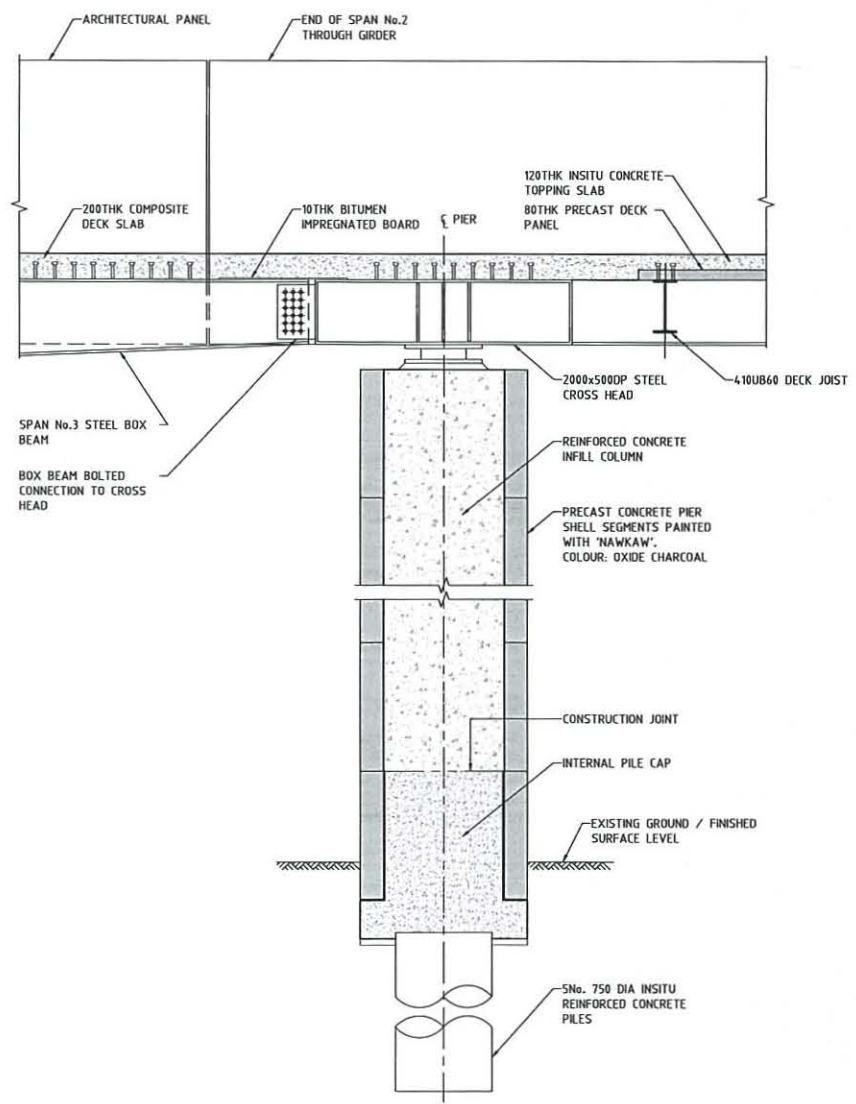
H



CROSS SECTION - PIER No.2
SCALE 1:20



PIER 1 - 3D REPRESENTATION
NTS
NOTE: PIER 2 SIMILAR



LONGITUDINAL SECTION - PIER No.2
SCALE 1:20

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

C	ISSUED FOR TENDER	JT / 07.11.16			
B	ISSUED FOR TENDER	JT / 01.11.16			
A	ISSUED FOR TENDER	JT / 28.10.15			
AMD	DESCRIPTION	DESIGNER SIGN/DATE	VERIFIED SIGN/DATE	APPROVED SIGN/DATE	
	CO-ORDINATE SYSTEM: MGA ZONE 56	HEIGHT DATUM: AHD	SCALE: 1:20		

CONSTRUCTOR:

SERVICE PROVIDERS:

Transport for NSW

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DRAWN	LINDSAY OFFNER	14/10/2016
DESIGNED	JOE TURNER	14/10/2016
DRG CHECK		
DESIGN CHECK		
APPROVED		

SYDNEY METRO CITY & SOUTHWEST
SYDNEY YARD ACCESS BRIDGE
DESIGN DRAWINGS
SYAB STRUCTURAL DETAILS
CROSS SECTIONS

STATUS: PRELIMINARY	SHEET: 1 OF 2
DRG NO: NWRLSRT-BGE-SYY-CV-DRWG-0090	

1 2 3 4 5 6 7 8 9 10 11 12

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 Printed by: JACOB HARTEN

Attachment 2

Typical Details and Materials

Typical detail/ material **Description**

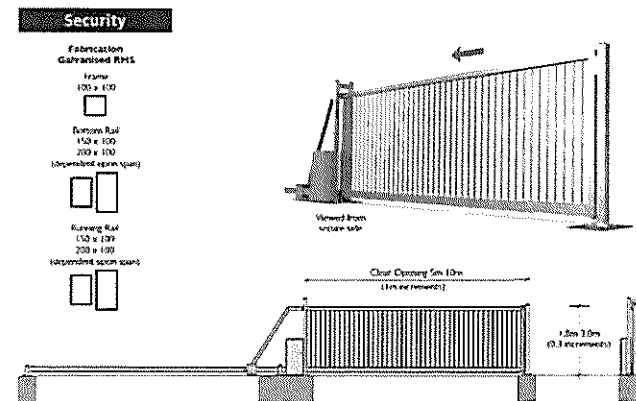
Gates:
Cantilever
single leaf
sliding gate

- Height: 3.0m
- Gate infill: mesh
- Frame fabrication: 100mm x 100mm
- Bottom rail fabrication: 200mm x 100mm
- Running rail fabrication: 150mm x 100mm
- One control cabinet and structural footing: 800mm (w) x 1,600mm (l) x 800mm (d); standard steel reinforcement cages and conduit
- Two structural footings: 500mm (w) x 800mm (l) x 800mm (d)
- Hot-dip galvanisation corrosion protection and finishing
- Industrial duty wet spray: black.

Benchmark

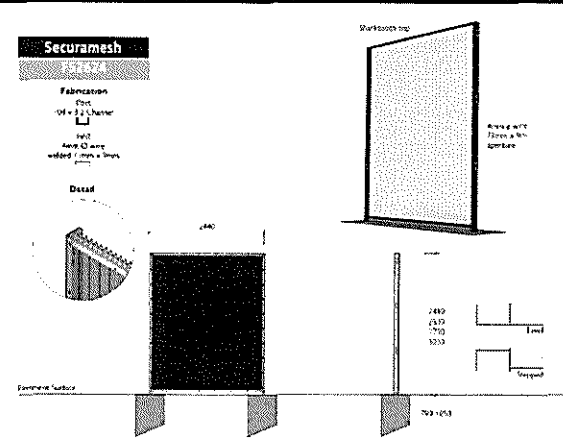
Cantilever gates
"Security"
Code: CLS
Card Readers
Standard gate control cabinet
Supplier: Leda

Photo/drawing

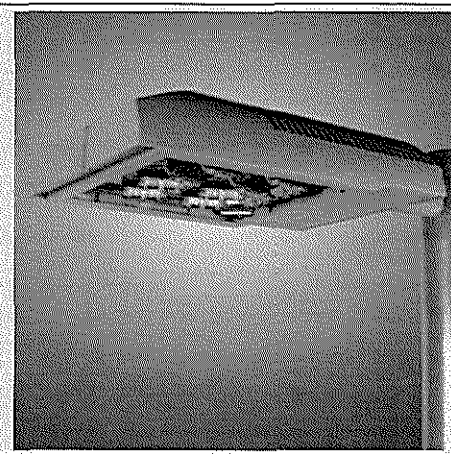


Typical detail/ material	Description	Benchmark	Photo/drawing
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Fences: Boundary fencing (security mesh fence)	<ul style="list-style-type: none"> • Height: 3.030m • Post fabrication: 104x3.2 channel • Mesh infill fabrication: 4mm diameter wire welded 71mm x 9mm openings; anti-climb. • Sharktooth top 25mm high 	"Securamesh" Code:FS2624 Supplier: Leda	<p>The drawing shows a technical elevation of the Securamesh fence. It features a 'Sharktooth top' with a height of 25mm. The main mesh section is 2440mm high. A detail view shows the 'Fabrication' of the mesh: 4mm diameter wire welded in a 71mm x 9mm grid. The post fabrication is 104mm x 3.2mm channel. The drawing also shows a cross-section of the fence on a 'Foundation surface' with a height of 700-1050mm. A note indicates 'Mesh with 15mm x 15mm aperture'.</p>
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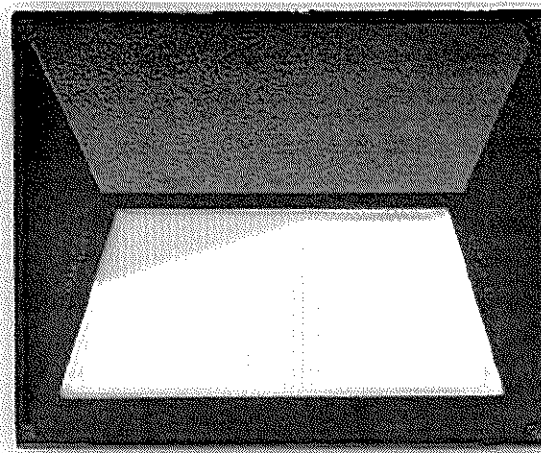
Lights: Entrance road lighting and poles	<ul style="list-style-type: none"> • IP rating: IP66 • LED: LED twin fixtures (2 off) • Material: Stainless steel construction with thermoset polyester powder coated finish; colour – matt black • Tapered light poles: 6m high, aluminium construction with thermoset polyester powder coated finish (matt black colour); suitable for the mounting of a dual-head LED light fixture. 	KIM "Archetype LED" Pico Prism 4,200K Supplier: KIM Lighting	<p>The photograph shows a close-up of a light fixture mounted on a pole. The fixture is a rectangular, dual-head LED light fixture, identified as the KIM "Archetype LED" Pico Prism 4,200K. It is mounted on a tapered pole. The background is a plain wall.</p>
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Typical detail/ material	Description	Benchmark	Photo/drawing
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Lights: Access bridge lighting	<ul style="list-style-type: none">• LED recessed wall-mounted fittings (warm white 4,000k)• Typical dimension: 150mm x 120mm x 150mm• The fitting will have a minimum ingress protection of IP65 and impact protection IK08, be of heavy-duty industrial-grade aluminium construction, with thermoset polyester powder coated finish (light-grey colour to match the concrete wall finish).
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*To be confirmed during the detailed design stage. A picture of a typical light used for this purpose has been provided.







Light poles	Details of light poles are contained above in "Entrance road lighting and poles"
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Typical detail/ material	Description	Benchmark	Photo/drawing
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Throw screens	<ul style="list-style-type: none">• Stainless steel rope wire cable flexible screen, similar to FlexMesh• Maximum opening no greater than 25mm x 25mm.	Albert "Tibby" Cotter Walkway, Anzac Parade
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Typical detail/ material	Description	Benchmark	Photo/drawing
Bridge deck	<ul style="list-style-type: none"> Spans 1 and 2 will have two box beam through girders 2.2m deep, with transverse beams below deck. Span 3 will have four steel box girders below deck. Lightweight steel cladding panels on the sides of Span 3 will conceal the under-bridge box beams and give a seamless look between the Span 1 and 2 box girders and composite steel-concrete of Span 3. The deck will be a reinforced concrete slab broom finish. All steelwork will be painted in accordance with RMS B220; colour – off-white. 	Hunter Expressway, Newcastle, NSW (right)	
Crash barrier	<ul style="list-style-type: none"> Concrete crash barrier type-F profile. Class 2 off form finish in accordance with AS1379, AS5100 and AS3610. Painted to match Box girder with Nawkaw “off-white”. 	V-columns at 200 George Street, Sydney (right)	
Concrete finish	<ul style="list-style-type: none"> Concrete crash barrier type-F profile Class 2 off form finish in accordance with AS1379, AS5100 and AS3610 Painted with Nawkaw “off-white” to match box girder. 	V-columns at 200 George Street, Sydney (right)	

Typical detail/ material	Description	Benchmark	Photo/drawing
Masonry finish	Not applicable.		
Steelwork finish	<ul style="list-style-type: none"> • Three-coat system, plus primer • Pre-coated paint coating system in accordance with RMS 3651. 	V-columns at 200 George Street, Sydney (right)	
Steelwork connections	<ul style="list-style-type: none"> • Where possible, steelwork connections will be welded, then painted with the entire beam. • On-site bolted connections between the through girders and transverse members are required and will be concealed by the through girders. • Connection plates and bolts will be painted off white. 	V-columns at 200 George Street, Sydney (right)	

Typical detail/ material	Description	Benchmark	Photo/drawing
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Feature element: Concrete/ retaining wall	<ul style="list-style-type: none"> • 200mm wide off form concrete freestanding wall and retaining wall. • All finishes will be class 2 off form painted with Nawkaw charcoal. • Joints to be consistent at both abutments. 	Boat Beach Road, WA	
Vehicle arrester: Crash-tested road block	<ul style="list-style-type: none"> • Height: total raised height 1,000mm • Width: 3,000mm • Axle loadings: 30t • Power: 415V/3ph/50Hz • Controls: PLC programmable control system, which is flexible and customisable for integration with all access controls. 	Code: Road Blocker Supplier: Leda	



Vehicle arrester: Crash-tested road block	<ul style="list-style-type: none"> • Height: total raised height 1,000mm • Width: 3,000mm • Axle loadings: 30t • Power: 415V/3ph/50Hz • Controls: PLC programmable control system, which is flexible and customisable for integration with all access controls. 	Code: Road Blocker Supplier: Leda	
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PART D – MANAGEMENT REQUIREMENTS

Schedule D1. Sydney Metro Requirements

(Clause 1.1, 2.9, 2.10, 3.1, 3.3, 3.9, 4.2, 4.3, 4.4, 5.3, 7.10, 9.7, 10.2, 12.2, 14.1)

The Sydney Metro Requirements comprises the following documents:

- a) SMR P - Prelude (Reference A5378910);
- b) SMR S – Safety Management (Reference A5378907);
- c) SMR E – Environment (Reference A5437887);
- d) SMR C – Stakeholder and Community Liaison (Reference A5378905);
- e) SMR T – Technical Management (Reference A5411773);
- f) SMR PA – Project Administration (Reference A5378908);
- g) SMR W – Workplace Development and Industry Participation (Reference A5437885); and
- h) Exhibit 1 – Reference Documents for Sydney Metro Requirements (refer to enclosed CD).



Transport
for NSW

Sydney Metro Requirements - Prelude - SYAB (SMR Prelude)

DOCUMENT NUMBER A5378910

Date of issue:

21 September 2016

Table of Contents

1. General.....	3
1.1. Scope	3
1.2. Definitions.....	3

1. General

1.1. Scope

The suite of Sydney Metro Requirements (SMR) documents describe requirements that the Contractor must comply with. The suite of SMRs must be read in conjunction with the other documents forming the Contract.

The Principal's suite of SMRs consists of the following documents:

- (a) SMR Prelude (*this document*)
- (b) SMR C – Stakeholder and Community Liaison;
- (c) SMR E – Environment;
- (d) SMR PA – Project Administration;
- (e) SMR S – Safety Management;
- (f) SMR T – Technical Management; and
- (g) SMR W – Workplace Development and Industry Participation.

1.2. Definitions

Unless noted otherwise, wherever used in the SMRs, words and phrases have the meaning given to them in the table 1.2 below.

Table 1.2 Definitions

Aboriginal	<p>an Aboriginal person is defined by the Aboriginal Land Rights Act, 1983 (NSW) as a person who:</p> <ul style="list-style-type: none"> • is of Aboriginal descent, • identifies as an Aboriginal person, and • is accepted by the Aboriginal community in which he/she lives.
Accredited Renewable Energy Supplier	a supplier or provider of renewable energy, accredited under the Australian Government's National Green Power Accreditation Program.
Approved for Construction (AFC)	a stage in the development of the design meaning that the related Design Documentation, reflecting this stage and status of the design, can be used for construction purposes.
Asset Maintenance & Operations Report	A report, to be included in each design package that details the approach to both the maintenance and operation of the assets and systems being constructed, during their operational life.
Australian and New Zealand Small and Medium Enterprises (ANZ SME)	micro, small and medium size enterprises with fewer than 200 employees, in Australian and New Zealand.
Apprentices	employees undertaking a recognised Australian apprenticeship program and related qualification holding a formal training contract with their employer. Apprentices must be directly employed or hosted via a Group Training Organisation by a Sydney Metro appointed Contractor or within the Supply Chain on specific Sydney Metro City & Southwest works, service.

Asset Handover	the point in time at which the control of certain specified assets is transferred to an Operator/Maintainer and/or Asset Owner for their ongoing operation and maintenance.
Asset Owner	an organisation who will ultimately own the assets subject to the Asset Handover. In some cases this may also be the Operator/Maintainer.
Audit Working Group	a working group established by the Principal with representatives from the Contractor, and other parties that may have an interest in the project, to manage the collaborative audit program.
Australian Carbon Offset Credits	credits comprising Australian Carbon Credit Units issued by the Clean Energy Regulator in accordance with the framework established by the <i>Carbon Credits (Carbon Farming Initiative) Act 2011</i> .
Australian Qualifications Framework (AQF)	Australian Qualifications Framework, which is the national policy for regulated Qualifications in Australian education and training. AQF Qualifications ensure national recognition and consistency, as well as common understanding across Australia of what defines each qualification.
CDR	means the critical design review at 100% or equivalent stage of the design as developed in accordance with the Contractor's systems engineering processes.
Calendar Quarter Date	The following dates are Calendar Quarter Dates: <ul style="list-style-type: none"> • 31 March; • 30 June; • 30 September; and • 31 December
Certified Aboriginal Business	a business certified as an Indigenous business by Supply Nation (formerly the Australian Indigenous Minority Supplier Council), or one which is certified as an Indigenous business by the NSW Indigenous Chamber of Commerce, or meets the definition of an Indigenous enterprise under the definition used in the Australian Government's Indigenous Procurement Policy.
Civil Construction	As defined by the Construction Work – Code of Practice by Safe Work Australia
Civil Construction Introduction Skills	A training program which forms a part of the Sydney Metro Industry Curriculum Program.
Civil Construction Introduction to Leadership	A training program which forms a part of the Sydney Metro Industry Curriculum Program.
Commissioning	the systematic process of ensuring that all infrastructure, equipment and systems installed in a project perform interactively in accordance with the design intent and the Operator/Maintainer's functional and operational needs.
Commissioning Event	An item of work generally carried out during a Track Possession, which ends with rail infrastructure being placed back into service, requiring a number of test and checks and associated certification prior to its completion.
Communications Management Control Group (CMCG)	a management group with representation from both the Contractors and the Principal, which provides a forum to exchange information and coordinate communication and consultation activities with Other Contractors and the Principal, to ensure a consistent approach to the community and other stakeholders is delivered.
Complete	where a Condition of Approval applies to a particular works package and no further evidence is required to demonstrate compliance.

Compliant	a temporary status assigned to a Condition of Approval which indicates a check of evidence has occurred and confirmed it is adequate to demonstrate the requirements of a condition is being met on the day it was checked.
Condition of Approval	a condition of a Planning Approval.
Configuration Management & Asset Assurance Committee (CMAAC)	means the committee established by TfNSW that is responsible for making decisions about the configuration of TfNSW transport assets.
Contract Management Plan (CMP)	unless otherwise defined in the Contract means a Management Plan to be developed by the Contractor in accordance with the requirements of SMR PA which acts as a framework for bringing together all the management requirements for the Contractor's Activities into a coordinated and integrated plan.
Control Gate	A stage or phase of the CCB and CMAAC configuration change management process.
Construction Environmental Management Plan (CEMP)	a Management Plan to be developed by the Contractor in accordance with the requirements of SMR E which describes how the Contractor will manage the environmental related matters and issues that arise during the term of the project.
Construction Traffic Management Plan	a Management Plan to be developed by the Contractor in accordance with the requirements of SMR PA which describes the procedures and processes the Contractor will implement to manage traffic.
Cultural Awareness Training	a structured program that brings employees together for cultural awareness, adding to their cultural knowledge and providing opportunities for staff to develop and apply their cultural and cross-cultural skills, and delivered by a Certified Aboriginal Business.
Demolition	to demolish or dismantle a structure or part of a structure that is load bearing or otherwise related to the physical integrity of the structure (including bracing, propping, falsework, etc.)
Disability	Disability is broadly defined in anti-discrimination/EEO laws and includes: <ul style="list-style-type: none"> • Physical disability • Physical illness or disease that makes, or has made, any part of the body or brain work differently • Mental or psychiatric disability, including any part of the body or brain work differently • Intellectual disability • Disfigurement or different formation of any part of the body • Any organism in the body that could cause disease or illness e.g. hepatitis or HIV with no symptoms.
Draft Community Communications Strategy	a Reference Document in SMR C produced by the Principal.
Earned Value	a method of measuring and reporting project cost performance based on integrated time, cost and scope elements.
Emergency Works	unplanned work which must be undertaken immediately in order to avoid damage to property or injury to people.

Environmental Compliance Requirements (ECRs)	The all the requirements arising out of the Planning Approval and its related Conditions of Approval, for which the Contractor must comply in accordance with the Contract.
Endangered Ecological Communities	the Endangered Ecological Communities listed in the <i>Threatened Species and Conservation Act 1995</i> .
Experienced Worker	any worker who has a minimum of 26 continuous weeks relevant Demolition industry experience prior to commencement on Sydney Metro works or operations.
Experienced Worker course	A training program which forms a part of the Sydney Metro Industry Curriculum Program.
Final Community Communications Strategy	means the finalised version, based on an update of the Draft Community Communications Strategy, created by the Principal from information provided by the Contractor.
Frequent Heavy Vehicle Drivers	<ul style="list-style-type: none"> • all excavated material removal vehicle drivers; • all concrete mixer vehicle drivers; and • any driver of a Heavy Vehicle over 4.5 tonnes GVM either supplying or removing equipment, plant and materials, or people from the Site who make 5 or more round trips in any 12 month period to any Sydney Metro worksites for any part of the program.
Fruin Level of Service	means a level of service standard for pedestrian access created by John J Fruin PhD.
Greenhouse Gas Reduction Target	the target referenced in TfNSW's Carbon Estimation and Reporting Tool, a Reference Document.
Heavy Haulage Introduction Skills	A training program which forms a part of the Sydney Metro Industry Curriculum Program, to provide drivers with the knowledge, skills, motivation and confidence to drive heavy vehicles safely and professionally throughout congested and highly-pedestrianized metropolitan areas whilst undertaking a transport task required on the project.
Hold Point	a verification point beyond which the relevant part of the Contractor's Activities may not proceed without the verification and subsequent written authorisation of the Principal's Representative or the relevant nominated person.
IBM® Rational® DOORS®	is a proprietary Requirements Management application for optimising requirements communication, collaboration and verification.
Independent Safety Assessor	The individual or team consisting of the technical, behavioural and domain experience and expertise to deliver the independent safety assessment and provide an independent judgement that the safety approach, process, and arguments for the system are appropriate and adequate for the planned application and that the system satisfies those safety requirements.
Industry Curriculum Training Provider	Registered Training Organisation approved by Sydney Metro to deliver the Sydney Metro Industry Curriculum Program.
Introduction to Leadership	a training program which forms a part of the Sydney Metro Industry Curriculum Program.
Introduction Skills course	a training program which forms a part of the Sydney Metro Industry Curriculum Program.
Local	the 38 Local Government Areas (LGA) within the Sydney region and five LGAs in the Sydney Surrounds (Wyong, Gosford, Blue Mountains, Wollondilly and Hawkesbury).

Long Term Unemployed	a duration of unemployment of 26 weeks or more.
LPA	Local Possession Authority as described in the Sydney Trains Network Procedures
Management Plans	any of the Management Plans including Sub plans to be developed by the Contractor in accordance with the Contract which describe how the Contractor will manage related matters and issues that arise during the term of the project.
Marketing and Promotional Materials	those documents described in SMR C, clause 11.
Mature Aged Workers	is someone who is of 50 years of age or older.
Nationally Recognised Accredited Training	an AQF recognized qualification or part qualification, leading to formal certification or statement of attainment that a graduate has achieved learning outcomes as described in the AQF.
Navisworks	Proprietary 3D design review software application which allows the user to access and use 3D models.
New Entrant	a worker with less than 26 weeks relevant Demolition industry experience prior to commencement on Sydney Metro works.
Nominated Supervisor	a person who is licenced to carry out demolition works as defined by Work Health & Safety Regulation 2011.
Nominated Supervisor Course	a training program which forms a part of the Sydney Metro Industry Curriculum Program.
Notification	notice of forthcoming activity in relation to the project, generally provided by the Principal to the public.
Non-Traditional Trade	a non-traditional occupation for women is one in which women comprise 25 per cent or less of total employment.
Non Compliant	a temporary status assigned to a Condition of Approval which indicates a check of evidence has occurred and confirmed it is inadequate to demonstrate the requirements of a condition is being met on the day it was checked.
Ongoing	where a Condition of Approval applies to a particular works package which has commenced construction or non-construction activities, and the demonstration of compliance with the requirement is not yet complete.
Operator/Maintainer	an organisation that, post Asset Handover, will operate and maintain the assets. In some cases, this may also be an Asset Owner.
Operational Readiness	the process which ensures that the primary functional or operational output of a project or a defined part of a project is ready to operate, with all necessary operational plans and approvals in place, fully trained operating staff, all external works and related projects completed and with the Operator/Maintainer ready to accept the responsibility for ongoing operation and maintenance of the facility or assets generated by the Works.
PDR	means the preliminary design review or equivalent stage of the design at 60% design completion as developed in accordance with the Contractor's systems engineering processes.
Pre-Employment Program	a program that provides accredited new entrant level technical skills and employability training for the Long Term Unemployed and other under-represented groups in the workforce. Pre- Employment Programs are delivered by TfNSW and its nominated providers.
Presentation Material	the documents and materials to be used to present the design of the Works to the Principal as well as other stakeholders etc.

Project Criticality Analysis	A document prepared in advance of a Track Possession which makes an assessment of the operational and safety risk in the event of a delayed handback, and the course of action to be taken to mitigate any impact on the rail network.
Project Health and Safety Management Plan	a Management Plan to be developed by the Contractor in accordance with the requirements of SMR S and the Contract (termed Work Health & Safety Management Plan in the Contract) which describes how the Contractor will manage the safety related matters and issues that arise during the term of the project.
Property Management Plan (PMP)	a Management Plan to be developed by the Contractor in accordance with the requirements of SMR PA which describes the procedures and processes the Contractor will implement to manage property issues.
Public Communications Material	certain communications materials produced by the Principal from information provided by the Contractor, as defined in clause 8 of SMR C.
RAATM	a list of requirements, their verification attributes, and their traces. Sometimes referred to as a requirements verification and traceability matrix (RVTM)
Rail Introduction Skills	A training program which forms a part of the Sydney Metro Industry Curriculum Program.
Rail Introduction to Leadership	A training program which forms a part of the Sydney Metro Industry Curriculum Program.
Rail Safety Worker	Rail Safety Worker as defined in the Rail Safety National Law (NSW).
Reference Documents	those documents referenced in the annexures of the SMR documents with which the Contractor must comply. Reference Documents are contained in Exhibit 1 – Reference Documents for Sydney Metro Requirements.
Regulator	a holder of a public office, or a public authority, of the Commonwealth, or of a State, or member of a governmental regulatory agency who or which is responsible for enforcing laws, regulations, and established rules.
Requirements Management	management of a set of conditions or capabilities that must be met or possessed by a system, product, service, result or component to satisfy a contract, standard, specification, or other formally imposed document. Requirements generally include the quantified and documented needs, wants, and expectations of a Principal, sponsor, customer, and other clients (users) and stakeholders.
Risk Management Plan	a Management Plan to be developed by the Contractor in accordance with the requirements of SMR PA which describes the management of risks applicable to the undertaking of the Contractor's Activities on the project.
Safety Assurance Statement (SAS)	a document which provides the arguments that the proposed specific contract designs are safe (to be constructed, maintained, operated and decommissioned) and provides a formal demonstration through objective evidence that risks have been adequately assessed and minimised through a comprehensive safety risk management process. The SAS also demonstrates that the safety requirements have been identified, understood and achieved through the proposed design, construction, commissioning and operations and that all works have been carried out in accordance with the design and undertaken by competent people.
Safe Work Method Statements (SWMS)	the documents so titled prepared in accordance with SMR S and that give specific instructions on how to safely perform a work related task, or operate a piece of plant or equipment etc.
Schedule Meta-Data Requirements	the data requirement specified in the Sydney Metro Programming Protocol.

Skills Set	groupings of Units of Competency from a Training Package, which are combined to provide a clearly defined statement of skills and knowledge required by the individual to meet industry need, or a licensing or regulatory requirement.
SMPCH&SS	Sydney Metro Principal Contractor Health & Safety Standard SM PS-ST-221.
Sub plan	a sub plan of a Management Plan.
Supervisor	all workers who act in a supervisory capacity on Site from level one upwards.
Supply Chain	a network of contracted suppliers, participating in the delivery and operation of Sydney Metro City & Southwest, and includes but is not limited to the Contractor, its Subcontractors and consultants and other entities engaged by them.
SYAB Safety Assurance Plan	Sydney Metro's Safety Assurance Plan for the SYAB contract
Sydney Metro City and Southwest Skills and Employment Advisory Group (SEAG)	an advisory group with an objective to inform, advise and support the delivery of the Sydney Metro Workforce Development & Industry Participation Strategy. Members of SEAG are pre-approved by Sydney Metro.
Sydney Metro Industry Curriculum Program (SMIC)	<p>a range of mandatory pre-commencement training programs that will deliver defined minimum levels of competency within identified critical skills areas for Sydney Metro City & Southwest with the objective of establishing new industry benchmarks, improve work health and safety, and increase quality and productivity outcomes. The SMIC identifies critical skills as:</p> <ul style="list-style-type: none"> • Demolition • Tunnelling • Civil Construction • Rail • Heavy Haulage • Supervisory skills across all industry disciplines. <p>Training providers delivering these courses will be pre-approved Sydney Metro providers.</p>
Sydney Metro Orientation Training (SMOT)	Sydney Metro mandatory pre commencement training for all workers. This is integrated within the Sydney Metro Industry Curriculum Training Program. It will be provided as standalone training for individuals that hold required Units of Competency within Sydney Metro Industry Curriculum, or whose occupations do not fall in scope for Sydney Metro Industry Curriculum.

Sydney Metro Workforce Development Programs	<p>The Workforce Development Programs delivered by TfNSW and its Nominated Providers to support the delivery of the Sydney Metro City & Southwest Workforce Development & Industry Participation Strategy.</p> <p>They include –</p> <ul style="list-style-type: none"> • Sydney Metro Apprenticeship & Trainee Scheme • Sydney Metro Careers Program • Sydney Metro Diversity & Inclusion Programs: <ul style="list-style-type: none"> ○ Sydney Metro Pre-Employment Program ○ Aboriginal Participation Programs ○ Women in Non-Traditional Trades Program • Sydney Metro Workforce Skills Development programs: <ul style="list-style-type: none"> ○ Upskilling programs ○ Sydney Metro Industry Curriculum Program • Sydney Metro Job Brokerage • Sydney Metro Industry Participation Program
Sydney Trains Virtual Plan Room	an engineering document repository managed by Sydney Trains that is used for submission of Documentation to Sydney Trains.
Trainee	an employee registered as a trainee, holding a formal training contract with their employer. Trainees must be directly employed or hosted via a Group Training Organisation (GTO) by a Sydney Metro appointed Contractor or Supply Chain on specific Sydney Metro City & Southwest works, services.
Training Package	a set of nationally endorsed standards, qualifications and guidelines used to assess the skills and knowledge people need to perform effectively in the workplace.
Units of Competency	an AQF recognised specification of knowledge and skill, and the application of that knowledge and skill, to the standard of performance expected in the workplace.
Upskilling	Workforce training or development activity for employed individuals, undertaking one or more accredited courses of learning and development leading to Nationally Recognised Qualification, Skills Set or Units of Competency. Does not include 'training' undertaken to meet compliance requirements detailed in applicable pieces of legislation and associated regulations, standards and accreditations or in the various approvals, licenses, and permits that may be necessary for the commencement and control of work on the project.
Vacancies	specific positions offered for paid, ongoing workers, for work of 15 hours or more per week and at least three months duration.
Validation	the assurance that a product, service or system meets the needs of the customer or other identified stakeholders. It often involves acceptance and suitability with external customers.
Verification	the evaluation of whether or not a product, service or system complies with a regulation, requirement, specification or imposed condition.
Witness Point	a point where the Principal's Representative, or the relevant person nominated, may review, witness, inspect, or undertake tests on any component, method, or process of the Contractor's Activities.
Workforce	all workers employed directly or contracted by the Contractor, Subcontractors and the broader Supply Chain inclusive of management and professional, technical and trade.
Worksite Protection	any form of protection under the New South Wales Network Rules (as described in NWT300 Planning Work In The Rail Corridor)
Worksite Protection Personnel	the personnel assigned to implement the required Worksite Protection for work within the Rail Corridor.

Workplace Relations Management Plan	a Management Plan to be developed by the Contractor in accordance with the requirements of SMR PA and the “NSW Code of Practice for Procurement: Building and Construction” and its Guidelines.
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Exhibit 1 – Reference Documents for Sydney Metro Requirements

Exhibit 1 is contained on a CD marked *Exhibit 1 – Reference Documents for Sydney Metro Requirements*



Transport
for NSW

Sydney Metro Requirement – Safety Management – SYAB (SMR S)

DOCUMENT NUMBER A5378907

Date of issue:

31 August 2016

Table of Contents

1. Introduction.....	3
2. Contractor's Obligations	3
Annexure A: Reference Documents.....	4

1. Introduction

1.1. Purpose

This Sydney Metro Requirement – Safety Management - SYAB (SMR S) describes requirements and processes the Contractor must comply with in relation to safety. This SMR S must be read in conjunction with the Contract.

1.2. Interpretation

Unless noted otherwise, wherever used in this SMR S, words and phrases have the meaning given to them in the General Conditions or the SMR Prelude.

2. Contractor's Obligations

- (a) The Contractor must comply with the Reference Documents identified in Annexure A.
- (b) To that extent that Contractor's Activities may be undertaken outside a Track Possession, the Contractor may carry out certain Works under a lower level of protection than LPA, as prescribed in the Sydney Trains RailSafe Network Rules. In such circumstances, the Contractor must provide to the Principal's Representative for review in accordance with the Contract, a written approval from the Contractor's Representative detailing the specific Works to be undertaken, as well as written justification including a risk assessment.

Annexure A: Reference Documents

- SM PS ST-221 Sydney Metro Principal Contractor Health & Safety Standard



Transport
for NSW

Sydney Metro Requirement – Environment – SYAB (SMR E)

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Table of Contents

1. Introduction.....	3
2. Environmental Requirements	3
3. Sustainability	3
Annexure A: CEMF Requirements included in the Contractor’s Activities	7
Annexure B: Reference Documents.....	12

1. Introduction

1.1. Purpose

This Sydney Metro Requirement – Environment – SYAB (SMR E) describes requirements and processes the Contractor must comply with in relation to the environment. This SMR E must be read in conjunction with the Contract.

1.2. Interpretation

Unless identified otherwise, wherever used in this SMR E, words and phrases have the meaning given to them in the General Conditions or the SMR Prelude.

2. Environmental Requirements

2.1. The Construction Environmental Management Framework

The Contractor must comply with the requirements of the SM ES-ST-204 Sydney Metro Construction Environmental Management Framework (CEMF), as detailed in Annexure A and any other Reference Documents identified in Annexure B.

2.2. Environmental Reporting

- a) The Contractor must provide a monthly report, using the SM ES-FT-421 Sydney Metro City & Southwest Environmental Reporting Template.
- b) Within 5 Business Days each Calendar Quarter Date, a register of ongoing Environmental Compliance Requirements (ECRs) must be submitted to the Environmental Representative for review in accordance with the Contract, which identifies progress and evidence of compliance against each ECR.
- c) The register of ECRs must classify each ECR as:
 - i. Ongoing or Complete, to indicate their progress; and
 - ii. Compliant or Non Complaint, to indicate compliance.

3. Sustainability

3.1. Sustainability Requirements

- a) The Contractor must ensure that sustainability is addressed throughout the performance of the Contractor's Activities and that sustainability is embedded into the design and construction of the Works and the Temporary Works.
- b) The Contractor must comply with the "TfNSW NSW Sustainable Design Guidelines" version 3.0 to meet a minimum Silver design rating. http://www.transport.nsw.gov.au/sites/default/files/b2b/projects/NSW_Sustainable_Design_Guidelines_V3_JAN14.pdf
- c) The Contractor must submit a completed checklist in electronic format to the Principal's Representative for review in accordance with the Contract at CDR and again prior to Completion. <http://www.transport.nsw.gov.au/projects/Planning-and-assesment/sustainability>.

3.2. Climate Change

- a) The Contractor must prepare and submit a Climate Change Impact Assessment Report to the Principal's Representative for review in accordance with the Contract, at the commencement of the CDR stage of design.
- b) The Climate Change Impact Assessment Report must:
 - i. be prepared in accordance with the guidance and requirements included in the TfNSW Climate Risk Assessment Guidelines 2016;
 - ii. identify any project-specific climate change risks (utilising climate modelling data);
 - iii. recommend risk mitigation measures to reduce the identified climate risks; and outline how risk mitigation measures will be addressed through the design process to reduce "extreme", "high" and "medium" risks to "low" where practicable; and
 - iv. demonstrate how the recommended risk mitigation measures have been/could be applied to the construction and operational phases of the project.
- c) The Contractor must implement risk mitigation measures to mitigate "extreme" and "high" risks.

3.3. Carbon and Energy Management

- a) The Contractor must prepare and submit to the Principal's Representative for review in accordance with the Contract, a Greenhouse Gas Inventory Report using the "TfNSW Carbon Estimation and Reporting Tool (CERT)" at CDR and at Completion.
- b) The Greenhouse Gas Inventory Report must include emissions associated with electricity and fuel consumption, on-site process emissions and embodied emissions for all materials used in the Contractor's Activities, Works and Temporary Works.
- c) The Contractor must achieve a minimum Greenhouse Gas Reduction Target of 15%, to be demonstrated using the "TfNSW Carbon Estimation and Reporting Tool (CERT)".
- d) The Contractor must ensure that, as a minimum, 25% of the electricity needs of the Contractor's Activities is offset through either one or a combination of the following:
 - i) purchase of Australian Carbon Offset Credits; and/or
 - ii) purchase of renewable energy from an Accredited Renewable Energy Supplier.
- e) The Contractor must ensure that refrigerants and any fire suppression systems used within temporary site facilities have low or zero global warming potential.
- f) The Contractor must identify and implement opportunities for using temporary or permanent onsite sources of renewable energy where practicable, such as application of integrated photovoltaic (PV) lighting, and PV on temporary Site facilities.
- g) The Contractor must use a minimum 5% bio diesel mix for all diesel powered plant and equipment and a minimum 10% blended ethanol mix for all petrol powered plant and equipment.

- h) Lighting design for Temporary Works and Works must incorporate energy saving luminaires and switching control systems to minimise energy consumption.

3.4. Resource Water Efficiency

- a) The Contractor must not use potable water as a substitute for non-potable water where on-site or local sources of non-potable water suitable for construction activities are available.
- b) The Contractor must ensure that 80% of offsite and onsite batching plant concrete production operation water is recycled and incorporated into concrete production.
- c) Suspended solid content of recycled concrete production water must be controlled such that the water density is less than 1.01 g/mL and the suspended solids content does not exceed 15,000 ppm. The Contractor is expected to pass this requirement down through its Supply Chain.

3.5. Waste and Materials

- a) The Contractor must ensure that concrete used in the Works and the Temporary Works meets the requirements set out in Table 3.5

Table 3.5

Design Concrete Characteristic Compressive Strength (MPa)	Maximum Cementitious Content (mass in kg Portland cement per cubic metre of concrete)
Up to and including 20 Mpa	280
Up to and including 25 Mpa	310
Up to and including 32 Mpa	360
Between and including 40 MPa to 65 MPa	450
Greater than 65 Mpa	500

- b) The Contractor must, where practicable:
- i. re-use demolition materials onsite, including steel from tracks; and
 - ii. use recycled steel, including in concrete reinforcing.
- c) The Contractor must use low Volatile Organic Compounds paints, finishes, sealants and adhesives and low emission formaldehyde composite wood products in the Works and the Temporary Works.
- d) The Contractor must ensure that all:
- i. concrete used in the construction of the Works and the Temporary Work is supplied by members of the Cement Concrete and Aggregate Association of Australia (CCAA) or a similar international association or organisation;
 - ii. steel used in the construction of the Works and the Temporary Work is supplied by suppliers that are certified under the Australian Certification Authority for Reinforcing Steels (ACRS) or a similar international association or organisation;
 - iii. fabricated steel products are specified in accordance with AS 5131 Fabrication & Erection of Steelwork and certified through the National Structural Steelwork Compliance Scheme;

- iv. PVC used in the construction of the Works and the Temporary Work is supplied by suppliers that meet the “Best Practice Guidelines for PVC in the Built Environment”;
<http://www.gbca.org.au/uploads/156/2716/Best%20Practice%20Guidelines%20-%20Verification%20Guidance.pdf>
 - v. the “Best Practice Guidelines for PVC” must be included in the manufacturer or supplier's independently audited ISO 14001, Environmental Management Systems, and audits must be conducted by a JAS-ANZ (or equivalent) accredited certification body; and
 - vi. timber products used in the Works and Temporary Works are from either re-used timber, post-consumer recycled timber or from Forest Stewardship Council Australia, certified timber suppliers.
- e) The Contractor must record the percentage of steel sourced from Australian manufacturers and make this information available to the Principal's Representative.

3.6. Pollution Control

- a) The Contractor must provide an inventory of non-road diesel vehicles to be used for the Contractor's Activities within 1 month of the date of the Contract and subsequently, annually using TfNSW's Air Emission Data Collection Workbook 9TP-FT-439.
- b) All stormwater treatment and water sensitive urban design measures must be implemented in the Contractor's Activities, the Temporary Works and the Works.

3.7. Sustainability Reporting

- a) The Contractor must provide a monthly report using the Sydney Metro City & Southwest Sustainability Reporting Template SME ES-FT- 429.
- b) Prior to the commencement of construction, the Contractor must prepare and submit a Pre-Construction Sustainability Report to the Principal's Representative for review in accordance with the Contract.
- c) The Pre Construction Sustainability Report must identify:
 - i. the sustainability initiatives which have been included in design; and
 - ii. the sustainability initiatives which will be implemented during construction activities.

Annexure A: CEMF Requirements included in the Contractor's Activities

CEMF Clause	Contractor's Responsibility
2.1	The Contractor must comply with these requirements except the Principal retains the obligation to address any legislation which is not relevant to SYAB works only.
2.2	The Contractor must comply with these requirements except the Principal retains the obligation to address any planning approval requirements not relevant to SYAB works only.
2.3	The Contractor must comply with these requirements.
2.4	The Contractor must comply with these requirements.
3.1	The Contractor must comply with 3.1 e and 3.1 f .The Principal retains the obligation to comply with this 3.1 a – 3.1 d inclusive.
3.2	<p>The Contractor must comply with these requirements, except that in:</p> <ul style="list-style-type: none"> a) 3.2 a. the Sustainability Management Plan (SMP) is to be a sub plan to the CEMP. b) the following components listed under Section 3.2 b. of the CEMF, are not required to be included in the Sustainability Management Plan: <ul style="list-style-type: none"> i. A sustainability policy statement; ii. Details of the processes and methodologies which will be used to achieve the required scores under rating systems identified in Contract; iii. Details of the processes and procedures for undertaking climate change risk assessments; iv. Details of the processes and procedures for the identification and implementation of climate change adaption measures; v. Details of the approach to sustainable procurement; and vi. A Construction Carbon and Energy Management Plan.
3.3	<p>The Contractor must comply with these requirements, and in addition to the requirements of Section 3.3 g. the Principal Contractor's procedures included in the CEMP must be consistent with the following Reference Documents:</p> <ul style="list-style-type: none"> i. City and Southwest Construction Noise and Vibration Strategy (SM ES-ST-210); ii. Environmental Incident Classification and Reporting Procedure (SM ES-PW-303); iii. Water Discharge and Reuse Procedure (SM ES-PW-309); iv. Planning Approval Consistency Procedure (SM ES-PW-314); and v. Environment & Sustainability Policy (SM SE MM 102).

3.4	<p>The Contractor must comply with these requirements and in relation to Section 3.4 a. only the following issue-specific environmental Sub plans to the CEMP, are required:</p> <ul style="list-style-type: none"> i. Construction Spoil Management Plan; ii. Construction Traffic Management Plan (and its sub-plans per section 8.2); iii. Construction Noise and Vibration Management Plan; iv. Heritage Management Plan; v. Sustainability Management Plan; and vi. Pollution Incident Response Management Plan.
3.5	<p>The Contractor must comply with these requirements and must include the following activity specific environmental procedures:</p> <ul style="list-style-type: none"> i. the development and implementation of progressive erosion and sediment control plans; ii. dealing with unexpected Endangered Ecological Communities threatened species identified during SYAB, including cessation of work and notification of the Department of Planning and Environment, determination of appropriate mitigation measures in consultation with the Office of Environment and Heritage (including relevant re-location measures); iii. Air quality and dust monitoring procedure for monitoring and mitigation of Air quality and dust impacts; iv. the maintenance of outward facing elements of Site hoarding or noise barriers, including the removal of graffiti and weeds, and checking the health of retained vegetation around Site boundaries, and direction of any Site lighting; v. the demarcation and protection of retained vegetation, including all vegetation outside and adjacent to the SYAB footprint; and vi. A procedure for the assessment, classification, management and disposal of waste in accordance with the Waste Classification Guidelines (DECC, 2008).
3.6	The Contractor must comply with these requirements.
3.7	The Contractor must comply with these requirements.
3.8	The Contractor must comply with these requirements.
3.9	The Contractor must comply with these requirements except the Principal retains the obligation to comply with Section 3.9(d).
3.10	The Contractor must comply with these requirements.

3.11	Not applicable. The Principal retains the obligation to comply with this Requirement.
3.12	The Contractor must comply with these requirements.
3.13	The Contractor must comply with these requirements except the Principal retains the obligation to comply with Section 3.13 e. and f.
3.14	The Contractor must comply with these requirements.
3.15	The Contractor must comply with these requirements.
3.16	Not applicable. The Principal retains the obligation to comply with this Requirement.
4.1	Not applicable. The Contractor must comply with SMR C in relation to Stakeholder and Community Involvement.
4.2	Not applicable. The Contractor must comply with SMR C in relation to Stakeholder and Community Involvement.
4.3	Not applicable. The Contractor must comply with SMR C in relation to Stakeholder and Community Involvement.
4.4	A Landscape and Temporary Works Management Plan is not required to be developed by the Contractor, however the Contractor's Activities must comply with the other requirements of Section 4.4 and SMR C.
4.5	The Contractor must comply with the requirements of Section 4.5 to the extent detailed in SMR C.
5.1	The Contractor must comply with these requirements.
5.2	The Contractor must comply with these requirements.
5.3	The Contractor must comply with these requirements.
6.1	The Contractor must comply with these requirements.
6.2	Not applicable. The Principal retains the obligation to comply with this requirement.
6.3	Not applicable. The Principal retains the obligation to comply with this requirement.
7.1	The Contractor must comply with these requirements.
7.2	Not applicable. The Principal retains the obligation to comply with this requirement.
7.3	Not applicable. The Principal retains the obligation to comply with this requirement.
8.1	The Contractor must comply with these requirements, except that Section 8.1 no longer applies and the Contractor must comply with the Reference Documents included in Annexure B
8.2	The Contractor must comply with these requirements, except that Section 8.2 no longer applies and the Contractor must comply with the Reference Documents included in Annexure B

8.3	The Contractor must comply with these requirements, except that Section 8.3 no longer applies and the Contractor must comply with the Reference Documents included in Annexure B
9.1	The Contractor must comply with these requirements.
9.2	The Contractor must comply with these requirements.
9.3	The Contractor must comply with these requirements.
10.1	The Contractor must comply with these requirements.
10.2	The Contractor must comply with these requirements.
10.3	The Contractor must comply with these requirements.
11.1	The Contractor must comply with these requirements.
11.2	Not applicable. The Principal retains the obligation to comply with this requirement.
11.3	Not applicable. The Principal retains the obligation to comply with this requirement.
12.1	Not applicable. The Principal retains the obligation to comply with this requirement.
12.2	Not applicable. The Principal retains the obligation to comply with this requirement.
12.3	Not applicable. The Principal retains the obligation to comply with this requirement.
13.1	Not applicable. The Principal retains the obligation to comply with this requirement.
13.2	Not applicable. The Principal retains the obligation to comply with this requirement.
13.3	Not applicable. The Principal retains the obligation to comply with this requirement.
14.1	The Contractor must comply with these requirements.
14.2	Not applicable. The Principal retains the obligation to comply with this requirement.
14.3	Not applicable. The Principal retains the obligation to comply with this requirement.
15.1	The Contractor must comply with these requirements.
15.2	Not applicable. The Principal retains the obligation to comply with this requirement.
15.3	Not applicable. The Principal retains the obligation to comply with this requirement.
16.1	The Contractor must comply with these requirements.

16.2	Not applicable. The Principal retains the obligation to comply with this requirement.
16.3	Not applicable. The Principal retains the obligation to comply with this requirement.
17.1	The Contractor must comply with these requirements.
17.2	Not applicable. The Principal retains the obligation to comply with this requirement.
17.3	Not applicable. The Principal retains the obligation to comply with this requirement.

Annexure B: Reference Documents

The Following are Reference Documents:

- TfNSW Climate Risk Assessment Guidelines 2016
<http://www.transport.nsw.gov.au/sites/default/files/b2b/projects/tfnsw-climate-risk-assessment-guideline-9tp-sd-081-1.pdf>
- Sydney Metro Construction Environmental Management Framework SM ES-ST-204
- City and Southwest Construction Noise and Vibration Strategy SM ES-ST-210
- Environmental Incident Classification and Reporting Procedure SM ES-PW-303
- Water Discharge and Reuse Procedure SM ES-PW-309
- Planning Approval Consistency Procedure SM ES-PW-314
- Environment & Sustainability Policy SM SE MM 102
- TfNSW Carbon Estimation and Reporting Tool (CERT)
<http://www.transport.nsw.gov.au/projects/Planning-and-assesment/sustainability>
- TfNSW CERT Reporting Tool Guideline 7TP-ST-035
- Air Emission Data Collection Workbook 9TP-FT-439
- Sydney Metro City & Southwest Environmental Reporting Template SM ES-FT-421
- Sydney Metro City & Southwest Principal's General Specification G10 Traffic and Transport Management SM ES-ST-214
- Sydney Metro City & Southwest Road Occupancy License SM ES-ST-460
- Sydney Metro City & Southwest Sustainability Reporting Template SME ES-FT- 429



Transport
for NSW

Sydney Metro Requirements – Stakeholder and Community Liaison – SYAB (SMR C)

DOCUMENT NUMBER A5378905

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Table of Contents

1. Introduction.....	3
2. General Obligations.....	3
3. Community Communication Strategy	4
4. Communications Management Control Group.....	5
5. Meetings with Stakeholders and the Community.....	6
6. Community Information Sessions	6
7. Planning Approval Requirements.....	6
8. Public Communication Material.....	6
9. Look Ahead Program.....	9
10. Community Signage	9
11. Contractor’s Marketing and Promotional Material	9
12. Branding and Logos.....	10
13. Enquires and Complaints Management	10
14. Media and Government Relations	11
15. Crisis Communication Procedures	11
16. Construction Site Visits	12
17. Contractor’s Hoardings and Fences	13
18. Signage, Graffiti and Bill Posters	13
19. Contractor’s Project Website.....	14
20. Site Inductions and Training.....	14
Annexure A: Reference Documents	15

1. Introduction

1.1. Purpose

This Sydney Metro Requirement – Stakeholder and Community Liaison - SYAB (SMR C) describes requirements and processes the Contractor must comply with in relation to stakeholder and community liaison. This SMR C must be read in conjunction with the Contract.

1.2. User Instructions

Unless noted otherwise, wherever used in this SMR C, words and phrases have the meaning given to them in the General Conditions or SMR Prelude.

1.3. Context

- (a) The Principal will take the lead on stakeholder and community liaison and will provide a Principal Manager, Project Communications to undertake stakeholder and community management, consultation and issue Notifications in relation to the Works, the Temporary Works and the Contractor's Activities.
- (b) This document describes the requirements and processes which the Contractor must implement as a minimum to ensure the Principal is equipped with the knowledge and information required to appropriately manage and engage positively with the community and other stakeholders, minimising disruption to the adjacent residents, property owners and all transport users.
- (c) The requirements of this SMR C also include those for the management of incidents and reporting as well as other related community and stakeholder management activities.

2. General Obligations

- (a) The Contractor must comply with the requirements of the Reference Documents listed in Annexure A.
- (b) The Contractor is required to:
 - (i) support the overall management and coordination of stakeholder and community liaison, consultation and Notification in relation to the delivery of the Works, the Temporary Works and the Contractor's Activities;
 - (ii) ensure the timeframes in clause 8 and resources for document development, consultation, approval and Notification are incorporated into project planning and the Contractor's Program;
 - (iii) ensure that the Principal Manager Project Communications, stakeholders and the community are provided with adequate Notification of planned construction activities and project milestones;
 - (iv) ensure that the Principal Manager Project Communications is included in team meetings and forums that provide information about ongoing work including weekly meetings;

- (v) ensure its employees, Subcontractors and agents are aware of and comply, initially with the Draft Community Communications Strategy and subsequently with the Final Community Communications Strategy and the broader requirements of this SMR C;
- (vi) be proactive in providing the Principal Manager Project Communications with accurate and adequate information on the status of the Works and any associated impacts;
- (vii) make available appropriate senior personnel (for example environmental manager, project engineer, project manager, technical experts) to attend meetings with the community or other stakeholders, as required;
- (viii) consult the Principal Manager Project Communications prior to taking any unilateral action that may impact on the stakeholders or the community;
- (ix) ensure that the Principal Manager Project Communications is informed of all issues raised by an Authority in relation to the Contractor's Activities, Works and Temporary Works and is invited to all meetings, presentations and site visits attended by Authorities in accordance with the Contract;
- (x) ensure that the Principal Manager Project Communications is continuously informed of all issues raised directly with the Contractor by stakeholders and the community;
- (xi) ensure that the Principal Manager Project Communications is contacted immediately in relation to planned or unplanned community protests that may arise during the performance of the Contractor's Activities; and
- (xii) comply with all reasonable suggestions and requests of the community as agreed with the Principal Manager Project Communications.

3. Community Communication Strategy

- (a) The Principal has prepared a Draft Community Communication Strategy. The Contractor must provide information as requested to assist the Principal Manager Project Communications finalise and implement the Final Community Communication Strategy.
- (b) All information required from the Contractor for the Final Community Communication Strategy will be required prior to the commencement of any activities on Site, and include the following, as a minimum:
 - (i) a comprehensive project-specific analysis of issues to be managed prior to and during construction, including proposed strategies to manage these issues and mitigate impacts to the community and stakeholders;
 - (ii) details of the Contractor's nominated 24 hour contact for assisting in the management of complaints and enquiries;
 - (iii) policies and procedures for Incident management and reporting;

- (iv) a schedule of key dates for the start and finish of construction activities, milestones and associated impacts to the community and the proposed strategy for minimising impacts to the community; and
 - (v) allow for policies and procedures for ensuring Subcontractors comply with the communications requirements of the Contract.
- (c) The Contractor will be required to comply with the Draft and then the Final Community Communication Strategy once provided to the Contractor.
- (d) The Contractor's Contract Management Plan, as further described in SMR PA must include processes and procedures to demonstrate compliance with the Final Community Communication Strategy.

4. Communications Management Control Group

- (a) The Principal Manager Project Communications will establish a Communications Management Control Group (CMCG) prior to the start of the Contractor's Activities.
- (b) The CMCG will generally meet fortnightly throughout the duration of the Contractor's Activities at the discretion of the Principal Manager Project Communications.
- (c) The CMCG will generally include:
- (i) the Principal Manager Project Communications;
 - (ii) the Construction/Project Manager;
 - (iii) the Site Manager; and
 - (iv) other parties or stakeholders, as required by the Principal's Representative.
- (d) The aim of the CMCG is to provide a forum to exchange information and coordinate communication and consultation activities with other parties and stakeholders and for the Principal to deliver a consistent approach to the community and other stakeholders.
- (e) The Contractor must provide all relevant information regarding any potential impact that its activities may have on the community in accordance with clause 8.1 (c) below (including local residents, property owners, businesses and transport users) for inclusion in the CMCG meetings. Such information includes:
- (i) a summary of current and upcoming works (two week and four week look ahead), their likely impacts, and proposed mitigation strategies to address these;
 - (ii) an update on any current or emerging issues and/or any promotional opportunities; and
 - (iii) other information as requested by the Principal Manager Project Communications.

5. Meetings with Stakeholders and the Community

- (a) The Contractor must provide its appropriate personnel to attend and participate in stakeholder and community meetings (including after-hours) as requested by the Principal Manager Project Communications.
- (b) The Contractor must assist the Principal Manager Project Communications in the production of relevant material for presentation and/or distribution at stakeholder and community meetings in accordance with clause 8.1 (c) below.

6. Community Information Sessions

- (a) The Contractor must provide appropriate personnel, including technical experts, to attend community information sessions as required and requested by the Principal Manager Project Communications.
- (b) The Contractor must provide materials or information in accordance with clause 8.1 (c) below, to support the community information sessions as requested by the Principal Manager Project Communications.

7. Planning Approval Requirements

When requested by the Principal Manager Project Communications, the Contractor must provide information or input into addressing any communication requirements outlined in the Planning Approval in accordance with clause 8.1 (c) below.

8. Public Communication Material

8.1. General Requirements

- (a) The Contractor must provide information to the Principal Manager Project Communications contributing to the production of Public Communication Material.
- (b) Public Communication Material includes but is not limited to:
 - (i) information for the CMCG;
 - (ii) information for community and stakeholder meetings;
 - (iii) materials for community information sessions;
 - (iv) information to comply with the requirements of the Planning Approval;
 - (v) community and stakeholder Notifications;
 - (vi) advertisements;
 - (vii) website content;
 - (viii) construction update newsletters; and
 - (ix) community emails.
- (c) The Contractor must allow the following time periods when scheduling its work and prior to carrying out the related Contractor's Activities:
 - (i) allow a preparation period of at least 5 Business Days for the Principal Manager Project Communications to prepare Public Communication

Material after acceptable submission of information and materials provided by the Contractor;

- (ii) allow a subsequent, period of at least 5 Business Days (in addition to the initial 5 Business day period) for the Principal Manager Project Communications to gain approval of that Public Communication Material, prior to it being issued for its intended purpose; and
- (iii) allow an additional 7 calendar days after the Public Communication Material is issued to the community or stakeholders, before it commences any related Works or Temporary Works.

8.2. Community and Stakeholder Notifications

8.2.1. Planned Activities

- (a) The community must be notified of any current and upcoming Works or Temporary Works or Contractor's Activities with the potential to impact on stakeholders and the community, prior to them occurring in accordance with clause 8.1 (c) . The Principal Manager Project Communications will issue community and stakeholder Notifications using information and materials provided by the Contractor.
- (b) The Contractor must provide the following information to the Principal Manager Project Communications for the Notifications:
 - (i) construction commencement;
 - (ii) significant milestones;
 - (iii) changes to the scope of work;
 - (iv) night works;
 - (v) changes to traffic conditions;
 - (vi) traffic and access arrangements;
 - (vii) any work around Utility Services
 - (viii) modifications to pedestrian routes, cycle ways and bus stops;
 - (ix) out of hours work;
 - (x) disruption of residential or business access;
 - (xi) likely impacts including noise, vibration, traffic, access and dust;
 - (xii) changing or disrupting of Utility Services; and
 - (xiii) investigation activities.
- (c) Where required by the Principal's Representative, the Contractor must provide a suitable person to assist the Principal Manager Project Communications provide a verbal or written Notification to residents of properties immediately adjacent to a worksite, prior to any work commencing.

8.2.2. Emergency Works

- (a) In the event of Emergency Works, the Contractor, in consultation with the Principal Manager Project Communications, must provide written and verbal Notification to residents of properties immediately adjacent to or impacted by any Emergency Works within 2 hours after commencing any Emergency Works. The Contractor must obtain approval from the Principal prior to issuing such community Notifications for Emergency Works. The Principal Manager Project Communications will coordinate all approvals from the Principal Manager Project Communications with assistance of the Contractor.
- (b) The Contractor must provide the Principal's Representative with information for community and stakeholder Notifications for Emergency Works including the following, as a minimum:
 - (i) scope of work;
 - (ii) location of work;
 - (iii) hours of work;
 - (iv) duration of activity;
 - (v) type of equipment used; and
 - (vi) likely impacts including noise, vibration, traffic, access and dust.

8.3. Project Advertisements

- (a) The local community and stakeholders are required to be informed on the status of the Works. As such certain advertisements are required to be produced to perform this requirement.
- (b) The Contractor must provide relevant information to the Principal Manager Project Communications in accordance with clause 8.1 (c) so that advertisements relating to the performance of the Contractor's Activities as required by Law and relevant Authority approvals can be prepared by the Principal Manager Project Communications and published.
- (c) The Principal Manager Project Communications will arrange the approval and will place all advertisements.

8.4. Construction Update Newsletters

The Principal Manager Project Communications may issue newsletters providing updates on the Works to the local community and stakeholders. The Contractor must provide relevant construction update information as requested by the Principal Manager Project Communications for inclusion in the newsletters, in accordance with Clause 8.1 (c).

8.5. Community emails

The Contractor must provide all construction update information requested by the Principal Manager Project Communications that will be used for inclusion in the Principal's overarching project emails on the status of the project.

9. Look Ahead Program

The Contractor must provide information and detailed explanations to the Principal Manager Project Communications regarding current and upcoming Works in the form of a 2 week and 4 week look ahead program which addresses all associated community impacts.

10. Community Signage

- (a) The Contractor must provide and erect signage that identifies changes to traffic and access arrangements that may include:
 - (i) making changes to pedestrian routes;
 - (ii) impacting on cycle ways;
 - (iii) changing traffic conditions; and
 - (iv) disrupting access to bus stops.
- (b) The Contractor must submit the intended wording and designs for the community signage to the Principal's Representative for review in accordance with the Contract.

11. Contractor's Marketing and Promotional Material

- (a) The Contractor must submit to the Principal's Representative for review in accordance with the Contract, any Marketing and Promotional Materials it wishes to create relating to the project including Subcontractors and consultants.
- (b) The Contractor must obtain approval from the Principal Manager Project Communications prior to issuing any such Marketing and Promotional Materials.
- (c) Marketing and Promotional Materials include, but are not limited to:
 - (i) signage;
 - (ii) displays;
 - (iii) award submissions;
 - (iv) media articles;
 - (v) advertisements;
 - (vi) internal newsletters;
 - (vii) internal websites and publications;
 - (viii) presentations at conferences;
 - (ix) presentations at internal events;
 - (x) technical papers;
 - (xi) photographs;
 - (xii) sponsorships;

- (xiii) website text and graphics;
 - (xiv) case studies; and
 - (xv) other corporate materials.
- (d) The Contractor must recognise and identify the Principal's role in any Marketing and Promotional Material that it develops in relation to the Works.
- (e) The Contractor must not participate in any public local events and open days without prior approval from Principal's Representative and the Principal Manager Project Communications.

12. Branding and Logos

The Contractor must follow the "Sydney Metro Brand Style Guidelines" for all branding and logos used on any items, including:

- (i) site signage;
- (ii) cranes (flags);
- (iii) other structures;
- (iv) vehicles;
- (v) barges;
- (vi) plant and equipment;
- (vii) all information to be used in Public Communication Materials;
- (viii) Marketing and Promotional Material;
- (ix) reports; and
- (x) Clothing, including personal protection equipment.

13. Enquires and Complaints Management

The Principal has established a Sydney Metro City and Southwest project 24-hour telephone contact number, postal address and email address to which enquires and complaints will be received.

The Contractor must:

- (a) Assist the Principal to respond and resolve enquiries and complaints in accordance with the relevant Community Communication Strategy;
- (b) ensure that its personnel and its Subcontractors' personnel direct the community and stakeholders to the project 24-hour telephone number, postal address and email address should they be approached directly;
- (c) provide a person that is available for contact by the Principal at all times to assist the Principal answer any complaints or enquiries in relation to the Contractor's Activities; and

- (d) provide feedback to requests for information from the Principal in relation to responses to complaints within 2 hours of the request and responses to general enquiries within 4 hours of the request.

14. Media and Government Relations

- (a) The Contractor must advise Principal's Representative and the Principal Manager Project Communications of any enquiry/contact by the media or elected government representative known within 2 hours.
- (b) The Contractor must not provide any statement (verbal or written) or any photographs or illustrations to the media or elected government representatives regarding the Contractor's Activities or project without the prior written approval of Principal's Representative and the Principal Manager Project Communications.
- (c) The Contractor must not permit any media or elected government representative on any part of the Site without the prior written approval of Principal's Representative and the Principal Manager Project Communications.
- (d) The Contractor must provide a suitably qualified spokesperson that has comprehensive knowledge of the Contractor's Activities to assist the Principal in the management of media and government relations as required and is authorised to prepare and issue media and other urgent enquiry responses 24 hours a day.
- (e) The Contractor must ensure relevant senior staff are available to provide the Principal with information required to respond to media and government enquiries, including the provision of a holding statement within 30 minutes of receipt of any request by the Principal, as well as a full response within 2 hours of the enquiry/contact being made. During an ongoing event, updates must be provided every hour.
- (f) The Contractor must provide the Principal Manager Project Communications with at least 8 weeks notice prior to the commencement of the Work and Temporary Works or other Site activities and 8 weeks notice prior to Completion of any Portion. An additional update must be provided 10 Business Days prior to Completion and confirmed 5 Business Days prior to the Completion of any Portions.
- (g) The Contractor must provide at least 20 Business Days notice to the Principal Manager Project Communications of any significant project milestones to enable the Principal to enable the organisation of official media events.

15. Crisis Communication Procedures

- (a) The Contractor must develop crisis management procedures as part of the Contract Management Plan detailed in SMR PA.
- (b) The Contractor must immediately notify the Principal Manager Project Communications of any incident that may have an impact on the community, environment, personnel or subcontractors, which may attract the attention of the media, the Minister for Transport, a local Member of Parliament, local council or the broader community.

- (c) In the event of such incidents, the Contractor must not contact or provide information to any person, other than that which is required to directly manage the Incident or to comply with law, without obtaining the prior approval of the Principal Manager Project Communications.
- (d) In the event of such incidents, the Contractor must provide a suitably qualified spokesperson that has comprehensive knowledge of the Contractor's Activities to assist the Principal in responding to stakeholders, the media or the public as required and requested by the Principal. The Contractor must also provide senior and experienced personnel to attend meetings with stakeholders, the media or the public as requested by the Principal Manager Project Communications.
- (e) The Contractor must provide the Principal Manager Project Communications with all necessary communications materials or information that may need to be disseminated as a result of an incident.
- (f) The Contractor must, in the case of an incident that has attracted or can reasonably be expected to attract the attention of the media, the Minister for Transport, a local Member of Parliament, or the broader community, notify the Principal Manager Project Communications within 10 minutes of the incident occurring and for any other incidents notify the Principal Manager Project Communications within 1 hour of the incident occurring.
- (i) The Contractor must invite the Principal's Representative to observe and participate in any crisis communication exercises it carries out.

16. Construction Site Visits

- (a) The Contractor must not organise any Site visits by stakeholders or community members without prior approval from Principal's Representative and the Principal Manager Project Communications.
- (b) The Contractor must provide the Principal with at least 48 hours prior written notice of all proposed stakeholder or local community member visits to the Site.
- (c) In the event the Principal is required to arrange for visitors to attend the Site, the Contractor must provide access with a minimum of 2 hours notice as required and provide a safety escort.
- (d) The Contractor must provide access as required by the Principal to facilitate media events arranged by the Principal including the provision of Site access, safety equipment, personal protective equipment (PPE), Site inductions and Site transport.
- (e) The Contractor must accommodate weekly visits to the Site for the Principal's personnel including access for the purpose of photography or videography for promotional purposes. Any photographs or film footage taken by the Contractor or the Principal's Representative becomes the property of the Principal who may, without the Contractor's approval, use the photographs and/or film footage for whatever purpose the Principal deems necessary or appropriate.
- (f) The Contractor must provide the Principal's Representative with access to the Site to install time lapse photography and provide a safety escort.

- (g) All photographs and videos taken by the Contractor is the property of the Principal and must be provided when requested.
- (h) The Contractor must obtain photographic release forms from all employees and contractors. Employees or contractors who opt-out, cannot be recorded in any photographs or videos which would prevent the Principal from using the material.

17. Contractor's Hoardings and Fences

- (a) The Principal will provide the Contractor with designs for the artwork to be used on the Contractor's hoardings and fencing and the Contractor must arrange for the production and installation of any site hoarding and fencing including shade cloth or other material on the external face of any hoarding or fence.
- (b) Installation plans for all hoardings or fencing, including shade cloth or other material on the external face of any hoarding or fence, detailing the design as well as the location and construction of associated structures must be submitted to the Principal for review in accordance with the Contract, prior to being erected.
- (c) Branding and logos on any hoardings and fencing, including shade cloth or other material on the external face of any hoarding or fence, must be replaced at least every twelve months.

18. Signage, Graffiti and Bill Posters

- (a) The Contractor must prepare and install any way-finding signage to direct pedestrians/commuters/vehicles around the Site as appropriate.
- (b) When requested, the Contractor must provide the required resources to assist the Principal with the provision and/or installation of any other signage or graphics required by the Principal, to be placed on or over the hoardings or fencing.
- (c) The Contractor must submit plans and details of all signage (other than signage containing safety advice or instruction only), advertising or branding on the external face of any hoarding, fence or structure to the Principal for review in accordance with the Contract.
- (d) Hoardings, site sheds, fencing, acoustic walls around the perimeter of the Site and any other structures built as part of the Works and Temporary Works must be maintained free of graffiti and any advertising not authorised by the Principal.
- (e) The Contractor must carry out daily inspections for graffiti and unauthorised advertising and must remove or cover any such graffiti or unauthorised advertising identified within the following timeframes:
 - (i) offensive graffiti must be cleaned or covered within 24 hours;
 - (ii) highly visible yet non-offensive graffiti must be cleaned or covered within 1 week;
 - (iii) graffiti that is neither offensive nor highly visible must be cleaned or covered during normal operations within one month; and
 - (iv) any advertising material must be removed or covered within 24 hours.

19. Contractor's Project Website

- (a) The Contractor must establish and maintain a new website or maintain a page on an existing web site to publish details on the status of the work.
- (b) The Contractor must only publish on the website:
 - (i) information required to be published to comply with the Planning Approval;
 - (ii) executive summaries of publicly available reports relating to the Works; and
 - (iii) documents which comply with the TfNSW WCAG 2.0 Quick Reference Guide.
- (c) The Contractor must not include any graphics or photographs on the website or page.

20. Site Inductions and Training

- (a) The Contractor must ensure its personnel and Subcontractors' personnel are adequately inducted and trained in all the stakeholder and community liaison requirements detailed in this SMR C, Sydney Metro Principal Contractor Health & Safety Standard SM PS ST-221 and the Sydney Metro Construction Environmental Management Framework SM ES-ST-204.
- (b) Site inductions and training material must be regularly updated to address any actions taken in response to stakeholder and community complaints and any changes to the Community Communication Strategy.
- (c) The Contractor must carry out further inductions and training of any personnel previously inducted and trained to ensure the stakeholder and community liaison requirements procedures and protocols remain understood and current.
- (d) All material produced for the purpose of Site inductions must be submitted to the Principal's Representative for review in accordance with the Contract.

Annexure A: Reference Documents

- Sydney Metro Brand Style Guidelines Version 4.0 July 2016.
- TfNSW WCAG 2.0 Quick Reference Guide V1.1 January 2016.
- Draft Community Communications Strategy
- Sydney Metro Construction Environmental Management Framework SM ES-ST-204
- SM PS ST-221 Sydney Metro Principal Contractor Health & Safety Standard



Transport
for NSW

Sydney Metro Requirements – Technical Management – SYAB (SMR T)

Document Number A5411773

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Table of Contents

1. Introduction.....	3
2. General Requirements.....	3
3. Design Development and Review	3
4. Requirements Management	7
5. Configuration Change Management.....	7
6. Incorporation of Hold and Witness Points	8
7. Commissioning and Operational Readiness.....	8
Annexure A: List of Reference Documents	10

1. Introduction

1.1. Purpose

This Sydney Metro Requirements – Technical - SYAB (SMR T) describes technical management requirements and processes with which the Contractor and any Subcontractors must comply. This SMR T must be read in conjunction with the Contract.

1.2. User Instructions

Unless noted otherwise, wherever used in this SMR T, words and phrases have the meaning given to them in the General Conditions or the SMR Prelude.

2. General Requirements

- a) The Contractor must prepare and submit design packages at PDR and CDR stages of the design to the Principal's Representative for review in accordance with the Contract.
- b) The Contractor must engage with project stakeholders in the development and delivery of the design.
- c) The Contractor must regularly attend meetings with the Principal and present design development and progress as required by the Contract and at the Principal's request.
- d) The Contractor must progressively validate, verify and certify the design, as the AEO.
- e) The Contractor must provide the Principal all necessary Design Documentation required to support all Configuration Change Request (CCR) applications and submissions by the Principal in support of the Configuration Control Board (CCB) Control Gates 3 and 4, and Configuration Management and Asset Assurance Committee (CMAAC) Control Gate 5.
- f) Following acceptable provision of CDR design package(s), Approved for Construction (AFC), Design Documentation must be prepared and submitted to the Principle's Representative in accordance with the Contract.

3. Design Development and Review

3.1. Preliminary Design Review (PDR) 60%

- a) The PDR design packages must:
 - i. be of a quality and detail to permit the Principal to assess whether the Contractor's proposed design approach complies with, and satisfies the functional and performance requirements of the Contract;
 - ii. demonstrate to the Principal that the Contractor has identified, considered and resolved all of the relevant design requirements of the Contract, and provided scaled detailed drawings; and
 - iii. provide sufficient detail to permit a meaningful review of the Design Documents by the Principal including the need for the addition of detail and

specifications only, to permit the construction of the design with minimal risk of any abortive construction.

- b) Any concessions or waivers to the ASA Requirements must be submitted, for approval to the ASA prior to PDR submission. All concessions must be approved by the ASA prior to CDR submission.

3.2. Critical Design Review (CDR) 100%

- a) Following acceptable provision of CDR design package(s), Approved for Construction (AFC) Design Documentation must be prepared and submitted to the Principle's Representative in accordance with the Contract.
- b) The CDR design package(s) must:
 - i. be fully complete, correct, detailed, and co-ordinated;
 - ii. be of a quality and content to permit the CDR design package documents to support application to the CCB Control Gate 3 for approval of the proposed configuration change;
 - iii. have closed out all prior design review comments and must be ready for their CDR status to be changed to AFC status without further amendment if no further comments are received from stakeholders;
 - iv. include a Safety Assurance Statement (SAS) in support of every design package;
 - v. Include Asset Maintenance & Operations Reports sufficient for stakeholders to fully appreciate the implications of the delivery of new or adjusted infrastructure which:
 - A. avoids the need for isolation, closure, Track Possession or the like in order to carry out operations and maintenance activities;
 - B. forms the basis of the asset management information to be provided at Asset Handover;
 - C. identifies and advises any necessary changes or increases to the current operations and maintenance requirements and regimes; and
 - D. includes details of all required operational activities required that may introduce hazards of any kind together with risk mitigation measures proposed.

3.3. Sydney Trains Working Group (STWG)

- (a) The Contractor must present the design to the Sydney Trains Working Group for review prior to the PDR and CDR submissions and at all other times requested by the Principal's Representative.
- (b) Prior to any presentation, the Contractor must allow 3 Business Days for the Principal's Representative to review the Presentation Material and provide an approval.
- (c) If the Principal's Representative does not approve the Presentation Material, it must be resubmitted in accordance with clause 3.3 (b) above and a further 3 Business Days will apply.

- (d) Once approved under clause 3.3 (b), the Contractor must allow at least 6 Business Days prior to presenting the Presentation Material to the STWG.
- (e) All comments from the STWG must be adequately addressed in the view of the Principal's Representative prior to submission of both the PDR and CDR to the Principal's Representative for review in accordance with the Contract.

3.4. Design Review Panel (DRP)

- (a) The Contractor must submit present the architectural, urban and landscaping elements of any designs to the Design Review Panel at the following times:
 - i. as soon as practicable after the date of the Contract; to provide guidance and comments on the proposed architectural, urban and landscaping designs;
 - ii. after consultation with all stakeholders including the Sydney Trains Working Group and prior to submission of the PDR; and
 - iii. Prior to submission of the CDR.
- (b) Prior to any presentation, the Contractor must allow 3 Business Days for the Principal's Representative to review the Presentation Material and provide an approval.
- (c) If the Principal's Representative does not approve the Presentation Material, it must be resubmitted in accordance with clause 3.4 (b) above and a further 3 Business Days will apply.
- (d) Once approved under clause 3.4 (b), the Contractor must allow at least 6 Business Days prior to presenting the Presentation Material to the DRP.

3.5. Safety Assurance

3.5.1. General

The Safety Assurance documentation must be developed in conjunction with the requirements for AEO and the Contract. The Contractor must also:

- a) submit to the Principal's Representative for review in accordance with the Contract, a fully completed Safety Assurance Report for inclusion in the final CCB Control Gate 3 submission;
- b) submit to the Principal's Representative in accordance with the Contract, a final, fully completed Safety Assurance Report with the CMAAC Control Gate 5 CCR;
- c) clearly define all residual risks in each Safety Assurance Report and Safety Assurance Statement prepared, which must also be ranked in both the Sydney Metro Risk Matrix (included in the Sydney Metro Principal Contractor Health & Safety Standard SM PS ST 221) and Operator and Maintainer's risk matrix; and
- d) submit to the Principal's Representative in accordance with the Contract, a Safety Assurance Statement to support each Commissioning Event.

3.5.2. Safety Assurance Plan

- a) The Contractor must have in place, maintain and consistently apply until Final Completion a Safety Assurance Plan that defines the assurance activities, evidence, deliverables and management arrangements.

- b) The Safety Assurance Plan must be submitted to the Principal's Representative for review in accordance with the requirements of the Contract.
- c) Notwithstanding the requirement in Section 20 clause (a) of the Sydney Metro Principal Contractor Health & Safety Standard SM PS ST 221, the Contractor must provide its finalised Safety Assurance Plan to the Principal's Representative for review, in accordance with the requirements of the Contract within 30 days of Contract award. For the avoidance of doubt this SAP must be at final status, rather than draft, and must comply with all the requirements described in this Contract.
- d) The Contractor must progressively review, monitor, amend and update the Safety Assurance Plan, and submit for review throughout the project in accordance with the Contract.
- e) The Safety Assurance Plan must include the schedule for the delivery of the assurance evidence for the Works. This must demonstrate that the Works have been designed to be operated and maintained with an acceptable level of safety and have been constructed, tested and commissioned in accordance with the approved design and integrated into the network.
- f) The Safety Assurance Plan must also include, as a minimum, the delivery milestones for:
 - i. Safety Assurance Reports;
 - ii. Safety Assurance Statements;
 - iii. preliminary hazard analysis;
 - iv. detailed hazard analysis;
 - v. reliability availability maintainability and safety analysis; and
 - vi. human factors analysis.
- g) The Contractor must meet the minimum requirements in the Sydney Metro Program Safety Assurance Plan SM PS-SG-001.

3.6. Independent Safety Assessor

- (a) The Principal will appoint an Independent Safety Assessor (ISA) to provide a separate and independent judgement as to whether the project is appropriate and adequate for the planned application and the system satisfies the safety requirements.
- (b) The Contractor must interact with ISA during the delivery of the Contract and must provide key evidence including information and Design Documentation as well as the resolution of safety assurance issues to the satisfaction of the Principal's Representative.

3.7. Digital Engineering Management

The Contractor must develop an integrated 3D digital engineering model using software for which the native format is viewable in Navisworks and submit to the Principal on a monthly basis for use in design reviews. The models must be accurate and maintained until Completion.

4. Requirements Management

The Contractor must adopt a formalised Requirements Management process to manage the requirements for the Contractor Activities and as a means of Verification and Validation compliant with EN50126/IEC 62278, and must:

- (a) use the IBM Rational DOORS database, or similar and compatible software, for System Requirements traceability and requirements verification of the Works;
- (b) provide a requirements analysis allocation and traceability matrix (RAATM) which complies with T MU AM 06007 GU - ASA Guide to Requirements Definition and Analysis, IEE1220, ANSI/EIA632 or a similar standard); and
- (c) submit an up-to-date RAATM with each design submission at PDR and CDR as well as the CCB and CMAAC Control Gate as identified in Clause 5.

5. Configuration Change Management

5.1. Configuration Management

The Contractor must have in place, maintain and consistently apply until Final Completion configuration management measures prepared in accordance with the ASA Requirements to ensure that, as a minimum:

- (a) all configuration management activities are in accordance with requirements of the Contract;
- (b) configuration management activities include a change management process aligned with AS ISO 10007-2003 Quality management systems - Guidelines for configuration management;
- (c) configuration management activities comply Configuration Management Plan Sydney Metro/Sydney Trains Interface Sub-Configuration Control Board document SM EM ST – 214; and
- (d) the Contractor must present the design to the Sydney Trains CCB when requested by the Principal's Representative.

5.2. CCB and CMAAC Control Gates

- (a) The Contractor must prepare and submit to the Principal all Design Documentation required to support the following applications by the Principal to the CCB and CMAAC:
 - i. CCB Control Gate 3 (for construction) submission, which applies before production of AFC Design Documentation;
 - ii. CCB Control Gate 4 (ready for testing) submission, which applies on completion of construction and is required as a condition precedent to testing and Commissioning the Works; and
 - iii. CMAAC Control Gate 5 (asset acceptance) submission, which applies after successful commissioning of the Works and is a condition precedent to the Works being put into operational service.
- (b) The Contractor must not commence any new project phase until the Configuration Control Board has issued a Configuration Change Acceptance Notice and after any conditions imposed by the CCB or CMAAC have been satisfactorily addressed.

5.3. Configuration Change Request Submissions to Control Gates

- (a) The Contractor must provide to the Principal all necessary Design Documentation required to support all CCR applications and submissions by the Principal in support of the CCB and CMAAC Control Gates.
- (b) The Contractor's proposed Design Documentation to support each CCR submission must be sufficient for and, of a quality that permits the Principal to gain CCB or CMAAC acceptance. The Principal may request additional Documents prior to the submission of each CCR.
- (c) The Contractor must provide a list of all Design Documentation provided for each CCR submission including revision numbers.
- (d) All CCR submissions will be submitted to the CCB or CMAAC by the Principal.
- (e) SM-EM-FT-413 Sydney Metro - Sydney Trains Interface Sub CCB Configuration Change Request Form must be used for all submissions which details the specific Design Documentation that is required to accompany the CCR at each of the required CCB and CMAAC Control Gates.
- (f) The Contractor may be requested to support all submissions by making available Subject Matter Experts to present to the CCB or CMAAC.
- (g) The Contractor must keep itself informed of the CCB and CMAAC timetable at all times during the course of the Contractor's Activities. The Contractor must include due allowance in the Contractor's Program for the preparation of the required CCR Design Documentation and to ensure that:
 - i. a minimum of 3 Business Days is allowed for the Principal to review and approve the proposed Design Documentation included in each CCR submission; and
 - ii. there is a minimum period of 6 Business Days after an approval has been provided under 5.3 (g) i, before the day of the Principal's presentation of the CCR submission to the CCB or CMAAC.
- (h) Applications of separate design packages for CCB and CMAAC review are permitted with prior agreement of the Principal. The Contractor shall give due consideration in determining a strategy for submission of discipline design packages so that each part of the Contractor's Activities may proceed logically and ahead of the completion of the design for later stages.

6. Incorporation of Hold and Witness Points

- (a) The Contractor must identify all Hold Points and Witness Points necessary to ensure that the Works will comply with the AFC Design.
- (b) The Contractor must ensure that all Hold Points and Witness Points are accurately incorporated into the Contractor's Inspection and Test Plans (ITPs).
- (c) The Contractor's design team must endorse each ITP prior to submission to the Principal's Representative for review in accordance with the Contract.

7. Commissioning and Operational Readiness

The Contractor must have in place, maintain and consistently apply until Final Completion systems and processes to ensure that the programming and coordinating of all

Commissioning, and Operational Readiness activities, including activities which may be carried out by third parties and are managed in accordance with the Contract and to enable the effective Asset Handover and operation of the Works to the Operator/Maintainer.

7.1. Submissions to Virtual Plan Room

- (a) The Contractor must submit AFC Design Documentation, work-as-executed drawings, and asset management information to the Sydney Trains Virtual Plan Room database.
- (b) On request, the Principal's Representative will provide a login and password allowing access and submission of Design Documentation directly by the Contractor.
- (c) The Design Documentation must comply with T MU MD 00006 ST – ASA Engineering Drawings and CAD Requirements

7.2. Completion of the Works and Asset Handover

The Contractor must assist the Principal in each formal Asset Handover involving acceptance and provide information and documentation including sign-offs of the systems and services with the Asset Owner's and/or the Operator/Maintainer's representatives.

Annexure A: List of Reference Documents

- TfNSW Inspection and Test Plans – Minimum Requirements 4TP-RL-002
- Configuration Management Plan Sydney Metro/Sydney Trains Interface Sub-Configuration Control Board SM-EM-ST-214
- Sydney Metro - Sydney Trains Interface Sub CCB Configuration Change Request Form SM-EM-FT-413
- Sydney Metro Program Safety Assurance Plan SM PS-SG-001
- Sydney Metro Principal Contractor Health & Safety Standard SM PS ST 221

Sydney Metro Requirements – Project Administration – SYAB (SMR PA)

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Table of Contents

1. Introduction	3
2. Management Plans	3
3. Specific Management Plans	5
4. Risk Management	13
5. Contractor’s Program	14
6. Document Management.....	17
7. Monthly Reporting	18
8. Quality	20
9. Audits and Surveillance	20
10. Working In and Adjacent to the Rail Corridor and Rail Environment.....	22
11. Property Management	26
Annexure A: List of Reference Documents	31
Annexure B: Property Compliance Checklist.....	32

1. Introduction

1.1. Purpose

This Sydney Metro Requirement – Project Administration - SYAB (SMR PA) describes project administration and management requirements and processes with which the Contractor and any Subcontractors must comply. This SMR PA must be read in conjunction with the Contract.

The Contractor must comply with the requirements of this SMR PA, including the Reference Documents in Annexure A.

1.2. User Instructions

Unless noted otherwise, wherever used in this SMR PA, words and phrases have the meaning given to them in the General Conditions or the SMR Prelude.

2. Management Plans

2.1. General Requirements

The Contractor must have in place, maintain and consistently apply until Final Completion, the Management Plans and associated Sub plans nominated in the Contract or referenced in Table 2.2 below. Each Management Plan must address the items below as well as any specific requirements described in the Contract.

- (a) **Policies:** A clear statement of policy for the discipline covered.
- (b) **Objectives:** The objectives that the Management Plan seeks to address and the processes that will be used by the Contractor to verify whether the Contractor's Activities and the Works are achieving those objectives.
- (c) **Requirements:** The requirements, procedures and processes for the management and implementation of the relevant Management Plan and how those will be delivered, including addressing the requirements of the Contract, Authority Approvals, Laws, Codes and Standards, programs, agreements and proposed agreements, drawings and reports.
- (d) **Documents/references:** Selected documents that are of ongoing importance for reference or monitoring, such as the development consent conditions. Where such documents are to be updated or are not immediately available, this should be noted in the Management Plan
- (e) **Procedures and processes:** Procedures and processes for the management and implementation of the relevant Management Plan.
- (f) **Roles and responsibilities:** The allocation of personnel roles, responsibilities and delegation of authority, including the division within and between the Contractor and Subcontractors.
- (g) **Deliverables:** The various relevant Contract deliverables, including all records, reports and certificates and the outputs of the management process and procedures are to be detailed. The Management Plan must demonstrate how the requirements will be achieved.
- (h) **Records:** A description of how the records of compliance, decisions and assumptions will be maintained.

- (i) **Timing:** An identification and integration of the timing for key milestones and targets.
- (j) **Assurance Auditing:** Procedures for surveillance, self-checking and audit by the Contractor to confirm compliance of the Contractor's Activities with the requirements of the Management Plan and the Contract, and the effectiveness of the Contractor's management systems.

2.2. Initial Submission

The timing for the initial submission of the Management Plans to the Principal's Representative for review in accordance with the requirements of the Contract is nominated below in Table 2.2 of this SMR PA.

Table 2.2 Requirement for Management Plans

Requirements Defined	Management Plan Title	*Timeframe for Initial Submission
General Conditions	Workplace Relations Management Plan	30
General Conditions	Quality Plan	20
SMR PA	Contract Management Plan	20
SMR PA	Construction & Site Management Plan	30
SMR PA	Commuter and Passenger Management Plan	30
SMR PA	Property Management Plan	30
SMR PA	Risk Management Plan	30
SMR PA	Defects Management Plan	80
SMR PA	Workforce Development and Industry Participation Plan	40
SMR PA	Training Management Plan	40
SMR PA	Engineering Management Plan	20
SMR PA	Commissioning & Operational Readiness Management Plan	80
SMR E/G10	Construction Traffic Management Plan (and its Sub plans)	20
SMR E/CEMF	Construction Environmental Management Plan (CEMP) and other management Plans and Sub plans required in the CEMF	20
SMR S/SMPCH&SS	Project Health and Safety Management Plan and its Sub plans	20

**measured in Business Days after the Date of the Contract*

2.3. Updating Management Plans

The Contractor's Management Plans must be progressively reviewed, monitored, amended and updated. The Contractor's reviews of the Management Plans must regularly reassess their applicability, suitability and effectiveness for managing the Contractor's Activities. As a minimum, the Management Plans must be updated every 12 months. Each update of the Management Plans must be submitted to the Principal's Representative for review, in accordance with the Contract.

3. Specific Management Plans

3.1. Contract Management Plan (CMP)

- (a) The CMP is the Contractor's overarching project Management Plan that describes all other Management Plans including any Sub plans and management systems that the Contractor is required to develop under the Contract. The CMP must provide a framework to bring together all the management requirements for the Contractor's Activities into one coordinated and integrated Management Plan.
- (b) The CMP must inform and direct personnel and others engaged by the Contractor about the specific work practices, resources, sequence of activities, controls and checks that are to be implemented during the performance of the Contractor's Activities.
- (c) The CMP must:
 - i. explain in a systematic, coordinated and integrated structure the management method for performing the Contractor's Activities in delivering the Works;
 - ii. define responsibilities, resources and processes for planning and performing the Contractor's Activities;
 - iii. define responsibilities, resources and processes for verifying that the Contractor's Activities meet the requirements of the Contract;
 - iv. cover all the project-specific management systems, Management Plans and project-specific deliverables required for the performance of the Contractor's Activities and to meet the requirements of the Contract;
 - v. cross reference each Management Plan required to be developed by the Contractor, through the use of a matrix or equivalent, listing its compliance with the relevant Contract and SMR conditions and requirements;
 - vi. identify the responsible person for developing and updating the CMP and any other Management Plan;
 - vii. describe how the Contractor will interface with the Principal's Representative to enable specific knowledge and experience of the Principal to be utilised in the development of the Management Plans;
 - viii. describe how the Contractor will comply with all Laws, Codes and Standards and requirements, applicable to the Contractor's Activities;
 - ix. document the interface between the Management Plans and the Contractor's corporate systems as applicable under the Contract; and
 - x. explain the alignment of the operating processes of the Contractor, Subcontractors and the Principal's Representative;
 - xi. describe how the Contractor will comply with and provide information to the Principal in accordance with the Draft Community Communication Strategy and Final Community Communication Strategy; and
 - xii. incorporate a surveillance schedule in accordance with clause 8 (e) below as well as an audit schedule and procedures for proactively managing auditing requirements consistent with the TfNSW Audit and Compliance Standard SM QM-ST-202 and clause 9 below.

3.2. Construction and Site Management Plan

- (a) The Construction and Site Management Plan must describe the procedures and processes that the Contractor will undertake to plan and execute the Works, including demolition and construction activities and must:
- i. detail how the Contractor will comply with its obligations under the Contract in relation to the control, establishment, security, use and rehabilitation of the Site including the arrangements to provide access to, within and through the Site for the Principal, Other Contractors and any other person nominated by the Principal;
 - ii. determine effective construction staging that will ensure that operations (including railway and other operations as applicable) and the associated transport facilities' operational requirements are maintained and impact to these operations is minimised and managed accordingly during construction of the Works;
 - iii. describe procedures for the preparation and implementation of plans and Safe Work Method Statements before the start of related construction work;
 - iv. describe procedures for the management of Subcontractors and their plans and Safe Work Method Statements;
 - v. describe the processes to ensure the compatibility of any necessary Temporary Works with each other and with the remainder of the Works;
 - vi. where the Works includes tunnelling, detail specific measures in relation to construction practices to maintain safety during tunnelling works in accordance with requirements of WHS Legislation;
 - vii. describe procedures to ensure the prompt identification and recording of Defects, and for the rectification of those Defects and the verification of the results;
 - viii. describe procedures for the Contractor's mobilisation and demobilisation to carry out the Contractor's Activities, including mobilisation and demobilisation of personnel, Construction Plant and equipment and closeout of stakeholder communications;
 - ix. address the Contractor's processes and procedures for the management of quality in accordance with the requirements of Clause 8 of this SMR PA
 - x. address the Contractor's management of time related facets of the Contractor's Activities, including the production and update of the Contractor's Program;
 - xi. address the management of interfaces with all Authorities and Other Contractors including:
 - A. communication channels, processes for ensuring efficient information flow, communication protocols and meeting schedules;
 - B. sequencing and timing of activities with the interfaces, including special programs;
 - C. programming of works and communications to be conducted in conjunction with operations by others such as, for example, Track

- Possessions, shutdowns or outages in conjunction with Operator/Maintainers and/or Asset Owners;
- D. roles and responsibilities of personnel and organisations for key aspects of the interface;
 - E. technical and program requirements;
 - F. work implications and applicable construction methodologies; and
 - G. review of work methods, processes and impacts on operations and services (for example timetables, etc.).
- xii. outline an incident reporting procedure and crisis management procedures with reference to the Contract, SMR S, SMR E and SMR C; and
- (b) The Construction and Site Management Plan must also refer to any associated Management Plans and Sub plans

3.3. Risk Management Plan

The Risk Management Plan must include:

- (a) an outline of the framework and approach for developing, utilising, and maintaining a risk register capable of supporting effective risk management and reporting risk information;
- (b) the management of risks applicable to the undertaking all of the Contractor's Activities;
- (c) details of the Contractor's approach to risk management, its risk framework, processes and internal controls to manage risks in accordance with ISO 31000 - Risk Management Guidelines and Principles and the TfNSW Sydney Metro Risk Management Standard SM RM-ST-201;
- (d) processes and procedures for the systematic identification, assessment, treatment and management of hazards and risks;
- (e) details on how the Contractor will embed risk management through the Supply Chain and into the various functions, procedures and activities necessary to achieve optimal risk management outcomes;
- (f) details on how the Contractor's decision making processes and risk management systems are aligned;
- (g) details of the Contractor's organisational structure that identifies risk management roles, responsibilities, and accountabilities, and the expertise and training required to perform such roles;
- (h) the consultation processes employed by the Contractor in relation to identified risks and the personnel involved in the consultation process;
- (i) the means to identify and quantify risk situations as they emerge and to initiate corrective action immediately, regardless of the timing relative to planned risk management process reviews;
- (j) details of key project timeframes and milestones where the Contractor will undertake risk workshops and meetings, including joint risk workshops with the Principal, to identify and, or review risks that update the Contractor's risk register;
- (k) the process that assigns, to an individual in the Contractor's management team, ownership of:

- i. each risk (including threat and opportunity events) to the project;
 - ii. each control measure to manage threats and opportunities; and
 - iii. each task (being a planned action and associated milestone to improve or enable effective controls).
- (l) details on the timing and scope of The Contractor's internal and external risk review processes, compliance, and audit related activities, including methods used to ensure that risk control measures and tasks are on schedule and effective;
 - (m) risk criteria and a risk matrix that are appropriate for the Contractor's Activities;
 - (n) details of how a risk register will be used as a tool to manage risks related to the delivery of the Contractor's Activities, and a template of the Contractor's proposed risk register;
 - (o) details of internal and external reporting of risks and risk management;
 - (p) a process and methodology for the management of any risks that are identified by the Principal, and for the inclusion of any such risks in the Contractor's risk register, as well as details of any specific measures The Contractor will adopt to minimise risks to the Principal's stakeholders and any third party stakeholder;
 - (q) details on how the Risk Management Plan will be implemented;
 - (r) details how the risks identified under the Risk Management Plan and its processes are integrated and managed with the other Management Plans;
 - (s) performance criteria for the Risk Management Plan and processes to report on their results in the Contractor's monthly report, described in clause 7; and
 - (t) processes and procedures to show how the requirements of clause 4 of this SMR PA will be implemented.

3.4. Quality Plan

The Contractor must develop a Quality Plan. The Quality Plan must document a project specific management plan which defines the procedures and other management controls which will be utilised to ensure compliance with the Contract. The Contract must reflect the Contractor's "AS/NZS ISO 9001" certified quality management system.

3.5. Commuter and Passenger Management Plan

- (a) The Contractor must have a Commuter and Passenger Management Plan that demonstrates how public movements will be accommodated during the various stages of the Contractor's Activities.
- (b) The Commuter and Passenger Management Plan must include:
 - i. drawings showing, as a minimum, the layout of public areas, including facilities provided for operational staff and patrons and systems drawings at each stage of the Contractor's Activities;
 - ii. drawings showing the proposed arrangement of the passenger facilities clearly showing the position of hoardings and provisions for interchange. Clearances and free area of platforms and the like should be clearly documented. Fruin Level of Service diagrams shall accompany the drawings and they shall indicate the proposed level of service for the proposed arrangement;

- iii. drawings showing proposed arrangement of signage covering existing signage and new temporary signage. Details must include location, size and wording of temporary and permanent way finding signage and proposed modification to any existing signage;
- iv. drawings showing proposed arrangement of passenger information panels including temporary relocations and modifications;
- v. a program clearly indicating when configuration will be changed and proposed period of change;
- vi. controlled Site access points;
- vii. delineation lines and material to be used for delineation;
- viii. access point from public modes of transport and general ingress and egress points;
- ix. identification of accommodation of level changes via ramps, stairs, and other means;
- x. details of how the Contractor will comply with the requirements to install signage and delineation (as shown in this Management Plan) to clearly communicate to the public and others routes to safely and easily navigate around or through the Site; and
- xi. the right of the Principal's Representative to direct the Contractor to include additional or alternative signage and delineation to that documented in the Commuter and Passenger Management Plan.

3.6. Workforce Development & Industry Participation Plan

The Workforce Development & Industry Participation Plan must address the requirements of SMR W and include:

- (a) the workforce development and industry participation team structure, including key personnel authority and roles of key personnel, lines of responsibility and communication, minimum skill levels of each role and interfaces with the overall project organisation structure;
- (b) how the Contractor will maximise opportunities for ANZ SME to deliver works, services or supplies that are required for Contractor's Activities;
- (c) plans to implement sustainable procurement initiatives that provide environmental and social improvements;
- (d) an outline of the systems that will be used to support workforce development and industry participation management; and
- (e) the approach to sustainable procurement including:
 - i. the approach for support of SMEs;
 - ii. the approach for support of Certified Aboriginal Businesses; and
 - iii. interfaces with other Management Plans.

3.7. Training Management Plan

The Training Management Plan must address the requirements of SMR W and must:

- (a) describe the Contractor's training policy and the training management guidelines;

- (b) describe systematic and comprehensive arrangements for managing the competence of Staff, including the plans, processes, tools and methods for:
- i. identifying professional development and training needs, considering:
 - A. prior learning and experience as a valid basis for competence development;
 - B. training requirements and procedures with law enforcement agencies, other emergency service providers and with other relevant transport providers;
 - ii. identifying potential skill shortages and gaps and how they might be addressed;
 - iii. planning, implementation and recording of relevant professional development and training activities to enhance the knowledge and skills of staff, and the organisation as a whole;
 - iv. periodic assessments of staff competence;
 - v. certification processes, including those required for staff undertaking systems assurance activities, testing and verification activities, and rail safety work as defined in the Rail Safety National Law;
 - vi. establishing and maintaining competence records and a register of staff, containing appropriate and timely information about all competence aspects of staff, including certification; and
 - vii. Upskilling staff through competency assessments to ensure they have appropriate technical and professional abilities.
- (c) provide an indication of how structured training outcomes including Nationally Recognised Accredited Training will be achieved;
- (d) include a schedule of training;
- (e) provide a detailed description of the training facilities and activities required;
- (f) provide an indication of how structured training outcomes including Nationally Recognised Qualifications will be achieved including reporting of targets and achievements as required by the training management guidelines;
- (g) include competence assessment programs and periodic proficiency testing by job function, and a resourcing schedule for instructors;
- (h) include a description of course content and training materials, including trainer guides, a list of training syllabi, presentations, learner notes and special tools or equipment;
- (i) provide a description of how quality of teaching, training and assessment will be evaluated, including training program development and delivery, trainer and assessor competence, resourcing and measurements of learner outcomes;
- (j) detail the strategies undertaken and outcomes of applications for workforce development funding and programs including subsidies and grants; and
- (k) outline the arrangements to maintain competence management records that contain appropriate and timely information about all competence aspects of a candidate.

3.8. Defects Management Plan

The Defects Management Plan must address the Contractor's obligations and responsibilities relating to the management of Defects and must:

- (a) address all contractual requirements for managing Defects;
- (b) clearly specify the strategy for managing any Defects raised internally by the Contractor, raised by the Principal and raised by the Operator/Maintainer;
- (c) reflect the requirements of the General Conditions of Contract; and
- (d) include a Defect management procedure.

3.9. Property Management Plan (PMP)

- (a) The PMP must describe the procedures and processes the Contractor will implement to manage property issues and to minimise, detect, assess, mitigate and rectify damage to property caused by or as a result of the Contractor's Activities including describing:
 - i. the management of risk and its mitigation;
 - ii. the processes for carrying out and managing all condition surveys;
 - iii. the processes for monitoring and managing property damage;
 - iv. processes for managing stakeholders, impacted adjoining land and assets;
- (b) In addition, the PMP must set out the following:
 - i. the damage mechanisms, including trials of construction procedures and methods to help assess the risk of property damage;
 - ii. noise, vibration and settlement limits that will prevent the damage of existing property and items by the Contractor's Activities and the need to transfer these criteria into method statements and inspection and test plans to ensure that any Contractor's Activities are within the above limits and minimise damage risks. The plan must include procedures for the review of, and change to, construction methodologies to minimise or prevent damage;
 - iii. a list of properties with the potential to be detrimentally or negatively affected by the Contractor's Activities;
 - iv. a list of the properties and assets which will be subject to a condition survey by the Contractor;
 - v. a clear statement that all Contractors' Activities causing any damage will cease until the construction methodology is reviewed and damage rectification agreed with the property owner and the Principal's Representative;
 - vi. the Contractor's procedures for communicating with property owners and for managing property damage claims including;
 - vii. inclusion of routine and regular advice to property owners and occupiers about the Contractor's Activities in close proximity to and with the potential to detrimentally or negatively affect their property;

- viii. receipt and recording of reports of and claims relating to damage thought to be associated with the Contractor's Activities, the Temporary Works and the Works; and
 - ix. processes and procedures for the management and resolution of any property damage claims.
- (c) The property condition survey section of the PMP must describe the Contractor's proposed approach to performing condition surveys. The plan must as a minimum:
- i. set out the minimum standards of pre-construction and post-construction condition surveys;
 - ii. include a procedure for the use of an independent third party to ensure compliance against the minimum standard of condition surveys; and
 - iii. describe how the Contractor will minimise disruption to property owners and occupiers by completing single condition surveys in agreement with Other Contractors and Subcontractors.

3.10. Engineering Management Plan (EMP)

- (a) The Engineering Management Plan must cover the Contractors AEO engineering management processes and controls which will be applied to the specific requirements of this Contract. The EMP must also address the requirements of SMR T.
- (b) The EMP must contain the following sections:
- i. Safety Assurance Management;
 - ii. Design Management including design review;
 - iii. Stakeholders and Interface Management;
 - iv. Systems Engineering;
 - v. Requirements Management;
 - vi. Verification & Validation in compliance with EN50126;
 - vii. RAMS management arrangements in accordance with EN50126;
 - viii. Configuration Management;
 - ix. Commissioning and Operational Readiness;
 - x. Handover and Asset Management.
 - xi. the Contractors design team organisation diagram naming all personnel and their parent companies;
 - xii. design personnel roles and responsibilities and lines of reporting;
 - xiii. a competence assessment register; and
 - xiv. the proposed design packages and milestone program for submission.

3.11. Commissioning and Operational Readiness Management Plan (CORMP)

- (a) The Contractor must develop a Commissioning and Operational Readiness Management Plan which documents the procedures and management controls to be used to ensure the Commissioning, Operational Readiness and Asset Handover activities comply with the Contract.

- (b) The Contractor must establish a Commissioning management team whose membership will include representatives of the Contractor, the Principal, the Asset Owner, the Operator/Maintainer, the Principal's technical advisors and any Other Contractors nominated by the Principal's Representative.
- (c) The role of the Commissioning management team, to ensure that the required activities to Commission the Works in accordance with the Contract must be described in the Commissioning and Operational Readiness Management Plan.

4. Risk Management

- (a) The Contractor must undertake risk management as an integrated part of the Contractor's Activities, including:
 - i. implementation of risk management techniques to identify and assess risks which are applicable to the undertaking of the Contractor's Activities and develop and implement strategies to treat and manage these risks to an acceptable level;
 - ii. undertaking risk management in accordance with the requirements of AS/NZS/ISO31000, ISO/IEC31010, and consistent with the requirements of TfNSW Sydney Metro Risk Management Standard;
 - iii. consideration of risk in order to identify potential property that could be affected or damaged by the Contractor's Activities;
 - iv. management of adverse impacts and realise potential opportunities relating to the performance of The Contractor's Activities;
 - v. holding joint risk workshops with the Principal at key project phases and milestones to identify and assess key risks associated with the Contractor's Activities and development mitigation strategies;
 - vi. production of a consolidated risk register that includes all reasonably foreseeable risks associated with the Contractor's Activities;
 - vii. a risk register that records the relevant details related to each risk, as a minimum the details specified in the Risk Management Plan;
 - viii. reporting on risks and risk management in accordance with the reporting requirements in the Risk Management Plan; and
 - ix. ensure that the individuals and resources allocated to risk management activities are suitably trained and made available to effectively implement the Risk Management Plan.
- (b) The Contractor must maintain an up-to-date risk register, consistent with the requirements of the Risk Management Plan, which is inclusive of the following:
 - i. a description of all risks applicable to all stages and phases including transition between phases and their likely impact;
 - ii. analysis, assessment and evaluation of all risks;
 - iii. details of specific risk control measures and proposed treatments for identified risks to eliminate or reduce risks;

- iv. the current and residual risk level assessed for each risk in terms of consequence and likelihood in a manner compatible with the Principal's risk management system defined in the Sydney Metro Risk Management Standard;
 - v. the personnel responsible for managing the risk and monitoring implementation of treatment measures; and
 - vi. demonstration that risks to safety have been eliminated, or have been minimised and managed so far as is reasonably practicable.
- (c) Upon request by the Principal's Representative, the Contractor must provide access to the Contractor's complete set of risk registers. Where the Contractor's risk registers are accessible electronically, and the Principal's Representative agrees, the Contractor may provide the Principal with access to project relevant parts of its electronic system in lieu of paper copies.
- (d) Prior to Completion the Contractor must provide a list of the residual risks which will be in existence beyond Completion.

5. Contractor's Program

- (a) The Contractor's Program and its updates must be submitted to the Principal's Representative for review in accordance with the clause 9.8 of the Contract. Updates and revisions of the Contractor's Program apply in the situations contemplated in clause 10.2 of the Contract. Nothing in this clause 5 limits the Contractor's obligations under clause 10.2 of the Contract.
- (b) The initial and all subsequent versions of the Contractor's Program must meet the following general requirements:
- (i) identify the Dates for Completion of each Portion and demonstrate how the Contractor will achieve Completion of each Portion by the relevant Date for Completion;
 - (ii) identify the full scope of the Contractor's Activities, and any Temporary Works including items such as traffic management, mobilisation, site establishment, interface management, review periods etc.;
 - (iii) be prepared using critical path method network technique using the precedence diagram method and identify the critical path(s);
 - (iv) minimise the use of positive or negative lags between activities by replacing lags with activities;
 - (v) not constrain the networks so as to prevent the program from reacting dynamically to changes;
 - (vi) include details on programming contingencies, providing rationale for the applied program contingency amount;
 - (vii) show the dates when the Contractor will require information, documents, materials or instructions from the Principal under the Contract and the dates when the Contractor will provide information or documents to the Principal, taking account of the review or approvals processes and timeframes contemplated by the Contract;

- (viii) be based on a time-scaled calendar in units of one week and identify working days, non-working days, shifts, statutory holidays, rostered days off, Christmas shutdown and any other shutdowns;
- (ix) identify planned and actual progress payments by graphical representation;
- (x) break down all activities into periods of no greater than four weeks with sufficient details to allow accurate monitoring of the progress of the Contractor's Activities;
- (xi) contain activities, each having an activity ID, activity description, original duration, early start date, early finish date, dependencies and total float;
- (xii) be resource loaded programs that identify key equipment, materials, plant, labour and management roles with sufficient level of detail to demonstrate adequate allocation of resources to complete the works or services on resource charts linked to the programs;
- (xiii) identify access and handover dates, staging and sequences of design and construction activities, other significant events, the critical path and the float relating to activities not on the critical path;
- (xiv) clearly identify access requirements and activities, including site access, track possessions, service outages, public domain access requirements;
- (xv) include details on the derivation of activity durations from work method design and construction methodology, resources availability and allocation, activity sequencing and/or cycle times and any other inputs affecting activity durations;
- (xvi) differentiate between the work to be undertaken by the Contractor and the work to be undertaken by Subcontractors;
- (xvii) identify the award of all significant contracts and subcontracts related to the Contractor's Activities;
- (xviii) identify all pre-construction activities and all reviews and approvals required to be obtained from Authorities, the Principal or Principal's Representative including preparation, consultation, submissions and reviews of Authority Approvals;
- (xix) identify all certification and licenses required to be obtained by the Contractor to comply with its obligations under the Contract;
- (xx) identify all off site and on-site activities associated with procurement, delivery and setting to work of specialist machinery including order dates, supply lead times and site delivery dates;
- (xxi) meet the requirements of Section 5, steps 2 to 6 inclusive of TfNSW's "Coordinating and Reporting of AEOC Critical Resources through P6" 4TP-PR-172.
- (xxii) identify all significant external events activities that have a bearing on time required to complete the Contractor's Activities;

- (xxiii) identify all staging of the Contractor's Activities and all external interfaces that:
 - A. impact on the Contractor's Activities;
 - B. impact on the activities of the follow on Contractor; and
 - C. provide opportunities for the follow on Contractor to commence work earlier.
- (xxiv) be submitted in electronic format which must include:
 - D. electronic format for publishing in Adobe Acrobat .pdf files;
 - E. native format (.xer) files that permits 100% data and format transfer with Oracle Primavera P6 Release 8.1;
 - F. layout and filter files (.pdf) together with the native format (.xer) files; and
 - G. allow interrogation by the Principal's Representative.
- (xxv) be prepared using Primavera P6 Professional Release 8.1 or later releases; and
- (xxvi) comply with the Schedule Meta-Data Requirements.
- (c) Monthly updates of the Contractor's Program must be submitted to the Principal's Representative on the 7th Business Day of each calendar month, which include progress information to the end of the preceding calendar month.
- (d) In addition to the general requirements of clause 5 (b) above, monthly updates of the Contractor's Program must also include the following:
 - (i) status the actual progress of activities based on the physical work completed. Actual progress must reflect a measurable physical unit of the work (as a percentage) using Earned Value which must not be calculated based on elapsed time or hours worked;
 - (ii) calculate Earned Value in accordance with "AS 4817-2006 Project Performance Measurement using Earned Value";
 - (iii) remaining duration, actual start and actual finish for progressed and completed activities;
 - (iv) show program changes as described in clause 10.2 d) of the Contract as separate activities, so that time can be clearly distinguished from the original Contract scope;
 - (v) clearly identify activities supporting progress payments, key milestones, and Portions;
 - (vi) clearly identify the amount of program contingency available for each Contract Portion;
 - (vii) a written narrative which clearly describes how the program has been developed. The program narrative must be in sufficient detail to enable the durations, leads and lags in the logic diagram to be assessed and to

explain any constraints that may exist within the program network logic, and must include the following:

- A. an overview of the delivery strategy as reflected in the Contractor's Program;
- B. executive summary program that is a maximum of two pages;
- C. time-chainage diagram;
- D. fundamental assumptions;
- E. key indicators of program progress, performance, and trends;
- F. long lead items, approvals and permits;
- G. critical path;
- H. calendars, working hours and work shifts;
- I. production rates and cycle times;
- J. construction staging and major work front configuration;
- K. resource allocation and profile;
- L. internal and external constraints;
- M. program analysis report;
- N. program risks and contingencies;
- O. program opportunities;
- P. quarterly review of the program confidence level supported by schedule risk analysis;
- Q. schedules of quantities used in developing the updated Contractor's Program; and
- R. mitigation measures that could be implemented in the case of delay.

6. Document Management

6.1. General

- (a) The Contractor must control all copies of the Management Plans and Contract deliverables in accordance with the Contract.
- (b) The Contractor must promptly advise the Principal's Representative of any changes made to the submitted documents and re-submit the amended documents within 5 Business Days of the amendment, with the amendments clearly marked on the document.

6.2. Principal's Document Management System Tool

- (a) Without limiting any specific requirements of the contract, the Contractor must use the prescribed Electronic Portal, as notified by the Principal's Representative for the entirety of the Contractor's Activities.
- (b) The Contractor must carry out all liaison activities within the Electronic Portal, including but not limited to:
 - (i) creation and responses to all project correspondence;
 - (ii) Requests for information (RFI);
 - (iii) upload of all controlled documents including but not limited to, drawings, specifications, procedures, checklists, management plans, test plans, inspections, Safe Work Method Statements, certificates and schedules;
 - (iv) all submissions for review by the Principal's Representative under clause 9.8 of the Contract; and
 - (v) transmittal of documentation to other project participants.
- (c) The Contractor must use the metadata codes, title information and document numbering format provided by the Principal's Representative when uploading documents to Electronic Portal.
- (d) Access to the Electronic Portal will be granted to the Contractor's staff following completion of general user training.

7. Monthly Reporting

Without limiting any other reports that may be required under the Contract, the Contractor must prepare and submit to the Principal's Representative for review in accordance with the Contract, a monthly report which meets the requirements of the Contract, including the following items:

- (a) a summary of the planned Contractor's Activities over the forthcoming month and quarter;
- (b) a list and timing of Hold Points and Witness Points planned for the forthcoming two months;
- (c) a description, including photographs, of the progress made on all current Contractor's Activities;
- (d) a summary of the financial status of the Contract, including detailed final cost forecasts, and separate lists for the cost of approved Changes, Claims and outstanding claims for Changes;
- (e) a cashflow forecast for the remainder of the Contractor's Activities on a month by month basis;
- (f) the number and categories of personnel and equipment currently engaged by the Contractor to carry out the Contractor's Activities (including those engaged in off-site functions), compared with the planned resources for the Contractor's Activities;
- (g) the status of Design Documentation, major procurement orders, Subcontracts, and general construction;

- (h) key dates for anticipated of design packages at PDR, CDR, and Approved For Construction stages (or as otherwise defined in the Contract);
- (i) the status of planning activities including Authority Approvals;
- (j) where Contractor's Activities involve any related Track Possession, shutdown or outage activity, the monthly report must also include monthly reliability statistics listing the following:
 - i. Incidents in Track Possession/shutdown/outage;
 - ii. Incidents in non-Track Possession/shutdown/outage;
 - iii. actual Incidents;
 - iv. potential Incidents in Track Possession/shutdown/outage; and
 - v. potential Incidents in non-Track Possession/shutdown/outage.
- (k) Safety statistics, as required by SMR S;
- (l) Defects in any Authority Approvals, Contractor's Activities, Works and Temporary Works and the steps taken by the Contractor to address those Defects;
- (m) any issues arising from or affecting the CMP and its related Management Plans;
- (n) records of all corrective and preventative actions taken by the Contractor under the Contract and audits of such actions;
- (o) cooperation, coordination, industrial relations and interface issues with Other Contractors;
- (p) status of interface management with Other Contractors;
- (q) summary updates relating to community issues and potential community issues;
- (r) complaints received by the Contractor in relation to the Contractor's Activities;
- (s) other key issues that have the potential to affect the Contractor's Activities;
- (t) the status of audit activities during the reporting period. As a minimum, the Contractor must provide the following information:
 - i. details of audits performed (planned vs completed);
 - ii. audit findings (with rating / priority) and corrective actions;
 - iii. implementation status of corrective actions (open and overdue); and
 - iv. explanation for audits not completed as planned and for overdue corrective actions.
- (u) The status of any property damage claims;
- (v) a summary of key risks and opportunities, as defined in agreement with the Principal and corresponding risk treatments or opportunity implementations, either underway or planned;
- (w) details of key risks likely to affect the Contractor's Program or the achievement of project objectives including those associated with key stakeholders including the community, key interfaces, WHS, environment and cultural heritage;

- (x) key changes in the Contractor's risk profile and risk register since the previous monthly report and trend reporting, including:
 - i. new or emerging risks that have been identified;
 - ii. risks that have increased or decreased in risk exposure rating;
 - iii. risks that have occurred and how the impact is being managed; and
 - iv. risks that have been closed or eliminated.
- (y) the current version of Contractor's risk register; and
- (z) Any other information the Principal's Representative reasonably requires.

8. Quality

8.1. Quality Management System

- (a) The Contractor must have in place, maintain and consistently apply until Final Completion an "AS/NZS ISO 9001" certified quality management system.
- (b) The Contractor must prepare a schedule of ITPs and ITP forms that the Contractor must use to verify that the Contractors Activities comply with the Contract.
- (c) The Contractor must submit a schedule showing the status of all ITPs, including any which are planned but not yet prepared, to the Principal's Representative on a monthly basis, for review in accordance with the Contract.
- (d) Where requested, the Contractor must submit any ITP to the Principal's Representative for review in accordance with the Contract.
- (e) The Contractor must prepare a schedule of Witness Points and Hold Points. This schedule must list all proposed Witness Points and Hold Points and must be kept up to date.
- (f) The Principal Representative may at any stage during the performance of the Contractors Activities nominate Hold Points and Witness Points for inclusion in the ITPs.
- (g) The Principal's Representative and the Environmental Representative may nominate persons to attend or witness the release of any Hold Point or to attend any Witness Point.
- (h) The Principal's Representative and the Environmental Representative must be given a minimum of 3 Business Days' notice of all forthcoming Hold Points and Witness Points.
- (i) The Contractor must assign a nominee for each Hold Point that is acceptable to the Principal's Representative.

9. Audits and Surveillance

9.1. Principal's Audit and Surveillance

- (a) The Contractor's Management Plans, systems and processes will be subject to audit and surveillance by the Principal to gain assurance that the Contractor has established effective management systems and processes to meet the requirements of the Contract. The Principal may utilise its own auditor(s) and

surveillance officer(s) to perform these activities, supported by subject matter experts where relevant.

- (b) The nature of audit and surveillance activities may include risk-based compliance testing; desktop review of documentation; inquiry and observation of activities; and review of developing processes or activities in the form of a review to test readiness to implement.
- (c) Where elements of the delivery program are sub-contracted, the Contractor must pass its audit and surveillance requirements to its Subcontractor and be able to provide evidence that these Contractor's Activities are being effectively overseen by the Contractor. If requested by the Principal, the Contractor will provide evidence of the effective implementation of management systems and procedures by its Subcontractors.
- (d) The Contractor must be cooperative in assisting the auditors and surveillance officers in undertaking their duties. This includes providing access to Sites; systems and documentation; facilities to perform audits and surveillance; and participation of representatives from the Contractor and Subcontractors if the scope of the audit warrants.

9.2. Collaborative Audit Program

- (a) Besides the Principal, a number of other parties (such as Regulators, an Authority etc.) are required to, or may have an interest in auditing systems and processes established by the Contractor. A collaborative audit program will be established by the Principal to coordinate audit activities across the project.
- (b) It is an objective of the Principal that these audit activities are coordinated in order to provide timely and cost effective assurance that aligns and standardises the planning, conduct and reporting of audits. The Principal will conduct audits on the Contractor's compliance with the requirements of the Contractor and the Contractor's quality management system.
- (c) The Principal may conduct audits on the Contractor's compliance with the Contract and Management Plans.
- (d) Audit findings are to be reported in accordance with the Principal's Audit and Compliance Standard SM QM-ST-202. This includes rating of audit findings based on an assessment of risk and priority for action. These records may be used by the Principal for any purpose.
- (e) The Principal will establish an Audit Working Group, with representatives from the Principal; Contractor; and other parties that may have an interest in the project, to manage the collaborative audit program. The Audit Working Group will, on a collaborative basis, develop, agree and implement a risk based audit program covering all aspects of the Contractor's Activities.
- (f) The Contractor must attend the Audit Working Group meetings. The meetings will be held whenever requested by the Principal, but will typically be held on a monthly basis.
- (g) Where the Contractor performs compliance audits of its systems and procedures, the Principal must be invited to participate in the audit planning and oversee conduct of the audit. The Contractor must provide a copy of the audit report to the Principal.
- (h) The Contractor must implement systems and procedures to ensure audit recommendations and corrective actions are actioned in a timely and agreed

manner. The status of audit action implementation must be reported by the Contractor, on a monthly basis.

- (i) Periodically, the Contractor must allow the Principal to verify the effectiveness of the audit action implementation and reporting process by providing evidence that audit actions have been implemented.

10. Working In and Adjacent to the Rail Corridor and Rail Environment

10.1. Operating Railway System

The Contractor acknowledges and agrees that:

- (a) it is aware that Sydney Trains or another Operator/Maintainer may continue to use areas adjacent to the Site as part of normal operations of the railway system on a commercial basis during the undertaking of the Contractor's Activities;
- (b) the continuance of normal operations of the railway system, including within the Rail Corridor, the Site, adjoining areas and railway stations, on a commercial basis by Sydney Trains or another Operator/Maintainer during the performance of the Contractor's Activities must be maintained to the satisfaction of the Operator/Maintainer as notified by the Principal's Representative;
- (c) it must ensure that the railway system operations and infrastructure are not impeded or interfered with by reason of the performance of the Contractor's Activities, except where this is approved in writing beforehand by the Principal's Representative;
- (d) it must maintain and coordinate sufficient access to the railway system, for users and Operator/Maintainers, so as not to hinder main traffic routes, including access to and from operating railway station platforms, ticketing areas and the Rail Corridor, and the flow of traffic, including on or accessing the Site and the adjoining areas, except where this is approved in writing beforehand by the Principal's Representative;
- (e) it must, in performing the Contractor's Activities, do everything that could be reasonably expected of the Contractor to avoid Sydney Trains or another Operator/Maintainer breaching any obligation it may have arising out of or in connection with the continuing operation of the railway system on a commercial basis;
- (f) it must ensure:
 - i. access and egress for Sydney Trains or another Operator/Maintainer and its contractors to the Site to undertake regular inspections and to complete maintenance and repairs of the operator's infrastructure where required;
 - ii. access and egress to those parts of the Site required by Other Contractor(s) are made available and coordinated so as to minimise any interference with or disruption to the Contractor's Activities; and
 - iii. emergency egress routes (including routes to the Rail Corridor and its support system) are maintained at all times and that emergency systems (including the Sydney Trains emergency warning intercommunication system and fire alarm panels) remain operational throughout the duration of the Contract;

- (g) it must provide a safe place for persons carrying out Rail Track inspections and/or maintenance work, for example, refuges in any hoarding/fencing constructed adjacent to the Rail Track;
- (h) it must comply with any Sydney Trains or other Operator/Maintainer standards applicable to the Works including for work that is adjacent to an operating rail line and to live overhead wires;
- (i) it must ensure that whilst undertaking the Contractor's Activities, no employees or Construction Plant (including, for example, by the slewing of cranes) of the Contractor, Subcontractors or consultants enter an operating Rail Corridor, except as permitted by Sydney Trains "RailSafe Network Rules"; and
- (j) it must at all times, and to the satisfaction of the Principal's Representative, carry out the Contractor's Activities in a manner that will ensure the safety of all property and persons, including the general public, travelling public, station lessees, railway traffic, railway system personnel, road traffic and any person associated or engaged in connection with the Contractor's Activities.

10.2. Track Possessions

- (a) The Track Possessions available to the Contractor are set out in the Contract.
- (b) The Contractor must submit to the Principal for review in accordance with the Contract, the following information not later than 16 weeks prior to all Track Possession, other than for midweek possessions outside peak periods (nominally from 10:00 to 14:00 Monday to Friday; or from 00:30 to 04:00 Tuesday to Friday), for which 6 weeks' notice is required instead:
 - i. Work Site Identification including project name, project number, budget, work description, critical risks to hand back, electrical permit requirements and safety risks;
 - ii. a worksite protection plan and an electrical isolation and bonding plan;
 - iii. Working Area – tracks, location and kilometrage;
 - iv. Contractors plant/resources;
 - v. Contractor's supervisor's names and numbers; protection officers names/numbers; and
 - vi. a Project Criticality Assessment using Sydney Trains Project Criticality Form PDM-210-FR-1, in accordance with Sydney Trains Project Criticality Assessment Process PDM-210-PR-1.
- (c) Where power isolation is required, the Contractor must specify what power is required to be isolated and the time and duration required for the power isolation. This information must be submitted to the Principal's Representative for review in accordance with the Contract at least 16 weeks prior to each Track Possession.
- (d) For each Track Possession to be utilised by the Contractor, the Contractor must attend and incorporate the requirements from:
 - i. the "Works Coordination Meeting" with Sydney Trains held approximately 12 weeks prior to the Track Possession. This meeting will decide the coordination of all activities in the Track Possession, working hours, movements of equipment and work trains in the Track Possession area;

- ii. the “Possession Finalisation Meeting” with Sydney Trains held approximately 4 weeks prior to the Track Possession to identify and resolve any clashes or interface issues; and
 - iii. the “Pre-Possession Meeting” with Sydney Trains, held approximately 3-5 Business Days prior to the Track Possession to confirm the detailed arrangements for the Track Possession and coordinate the activities of each party working in the Track Possession.
- (e) If a Track Possession involves an asset or partial asset being handed over to the Asset Owner or Operator/Maintainer (even if only for maintenance prior to it being commissioned), a Commissioning event and formal Asset Handover will be required. In these circumstances, the following documents appertaining to the assets being handed over are required to be submitted to the Principal’s Representative for review in accordance with the Contract at least six weeks prior to the Track Possession:
- i. Safe Work Method Statements;
 - ii. residual risk assessments;
 - iii. any asset management and operational documentation described in the SWTC;
 - iv. Design Documentation; and
 - v. any other documents required as directed by the Principal.
- (f) The Contractor may not have exclusive access to any Rail Tracks or areas within the vicinity of Rail Tracks during a Track Possession, and must coordinate the Contractor’s Activities with those sharing the Track Possession, including parties involved in the operation or maintenance of the rail system and Other Contractors. This includes, where required, the Contractor allowing for Operator/Maintainers’ contractors and Other Contractors to pass through the worksite(s) during the Track Possessions.
- (g) The extent of Operator/Maintainers’ contractors’ and Other Contractors’ activities on or within the vicinity of the Rail Track during Track Possessions will be determined at the “Works Coordination Meeting” referred to in clause 10.2 (e).
- (h) The Contractor must ensure that all persons invited or brought onto the Site by the Contractor or Other Contractors, and those who enter an area within the Rail Corridor undertake all necessary Site inductions and obey all directions given by the Worksite Protection Personnel.
- (i) The Contractor must comply with the requirements of Sydney Trains Possession Notice 10, in relation to the certification and handover of work.
- (j) Any Defects listed must be rectified by the Contractor to the satisfaction of the Principal within 5 Business Days of certification of the Works.
- (k) The Contractor must immediately comply with any instructions by the Principal’s Representative to alter or curtail the Contractor’s Activities if the Principal’s Representative considers that continuing with intended Contractor’s Activities will result in a delay to returning the Track Possession and/or delay to train operations.
- (l) The Principal may alter, cancel or curtail any Track Possession at any time.
- (m) If assets are being handed over to the Operator/Maintainer then the Contractor must assist the Principal in the process of formal Asset Handover.

- (n) The Contractor must prepare, maintain and update policies and procedures for planning and managing Track Possession work in accordance with the Sydney Trains Network Access Manual Volume 1 and Volume 2
- (o) The Contractor must prepare and submit to the Principal's Representative for review in accordance with the Contract, 12 weeks prior to each Track Possession:
- i. a consolidated plan comprising all information required in advance of the Track Possession including that detailed in the Sydney Trains Network Access Manual Volume 1 and Volume 2; and
 - ii. a Primavera P6 program including:
 - A. the elements of the Contractor's Activities to be completed prior to the Track Possession;
 - B. an hour by hour breakdown of the elements of the Contractor's Activities to be carried out during the Track Possession;
 - C. milestones and the time and date by which they must be achieved so as to ensure that the rail infrastructure can be reinstated within the allocated time and which, if not achieved by the nominated time, would result in the Contractor bringing work to an end and commencing reinstatement of the rail infrastructure and other works to avoid a delay in returning the Track Possession and/or delays to trains;
 - D. adequate allowance of time at the beginning and end of the Track Possession to safely remove and reinstate the affected rail infrastructure to operational condition and for providing and removing safeworking protection and the Operator/Maintainer inspections and certifications;
 - E. the specific risks to be managed during the Track Possession and the procedures to be followed in managing these risks;
 - F. any potential interface issue in any way connected with work carried out by an Other Contractor or involving the Operator/Maintainer's operational and maintenance activities; and
 - G. progress/program review meetings scheduled during the Track Possession as requested by the Principal's Representative and/or the Operator/Maintainer.
- (p) Where requested by the Principal, the Contractor must submit to the Principal's Representative for review in accordance with the Contract, a Project Criticality Analysis not less than 12 weeks prior to the Track Possession.

10.3. Certification of Work

Before handover of an area at the end of any Track Possession the Contractor must provide to the Principal's Representative and, if required by the Principal's Representative, to the Operator/Maintainer; the following:

- (a) for any form of civil or structural works that will support operating Rail Track, written certification by the Contractor's designers (including design Subcontractors) that the relevant works are safely able to support the operating rail infrastructure;
- (b) for any adjustments to or interruptions of service to signalling, track, overhead wiring or high voltage infrastructure, written certification from the Contractor's

designers (including design Subcontractors) that such infrastructure is suitable for operations and complies with the approved design;

- (c) for any adjustments to or interruptions of service to signalling, overhead wiring or high voltage infrastructure, written certification from a Sydney Trains' (or other relevant Operator/Maintainer's) representative that such infrastructure is suitable for operations; and
- (d) all other infrastructure certification required by Sydney Trains or the relevant Operator/Maintainer and/or Asset Owner.

11. Property Management

11.1. General Property Obligations

- (a) The Contractor is responsible for managing each Site and minimising the impact of the Contractor's Activities on adjoining owners during any investigations, early/enabling works, construction and Defects rectification activities. The Contractor must ensure it has the necessary legal rights to access the appropriate property prior to commencing the Contractor's Activities.
- (b) The Contractor must appoint a site-based person to be the Contractor's property representative. This representative must be present during all inspections undertaken by the Principal.

11.2. Property Damage

11.2.1. Pre-Construction Property Condition Surveys

- (a) The Contractor must carry out pre-construction property condition surveys to record the existing condition of adjoining land, properties and related infrastructure such as roads, footpaths rail and structures prior to construction and to assess the susceptibility of critical Utility Services or structures or buildings to damage or unacceptable changes or alterations as a result of the Contractor's Activities.
- (b) In addition to the requirements set out in the Contract and the SMRs, the Contractor must comply with all requirements for condition surveys and ongoing monitoring set out in Third Party Agreements.
- (c) The Principal's Representative may direct the Contractor to include additional properties and assets if it considers they have the potential to be damaged as part of the Contractor's Activities and a Principal nominated person may attend the undertaking of condition surveys.

11.2.2. Post-Construction Property Condition Surveys

- (a) Prior to Completion, the Contractor must perform a post-construction condition survey on each item previously subject to a pre-construction property condition survey.
- (b) The Contractor must ensure that post-construction property condition surveys are performed to the same standards as the pre-construction property condition surveys. The Contractor must ensure that the same surveyor performs both the pre-construction and post construction condition surveys on a particular property.
- (c) The Contractor must submit all post-construction property condition survey reports to the Principal's Representative for review in accordance with the Contract, within

10 Business Days of the survey. Each report must contain a certificate from the surveyor who performed the survey certifying that the survey has been completed and is an accurate assessment of the property's condition.

- (d) The post-construction property condition survey reports must include a determination of the cause of any monitored change or damage identified (if any) since the pre-construction or previous construction survey and the Contractor's proposed remedial works or activities. If any damage is found to have been caused by the Contractor's Activities, the Contractor must:
- i. provide the Principal's Representative with a proposal setting-out the remedial action required; and
 - ii. obtain the property owner's acceptance, in a form agreed to by the Principal, of the compensation, repair or reinstatement work, and release from future claims and actions.

If no damage is found to have been caused by the Contractor's Activities, the Contractor must:

- iii. write to the property owner and provide a copy of both reports for the property owner's records; and
- iv. provide the Principal's Representative with a copy of all records for its future reference.

11.2.3. Property Condition Surveys of Buildings

- (a) The Contractor must ensure that the processes and procedures for performing all condition surveys are based on industry best practices. Examples of acceptable standards for condition surveys of buildings include:
- i. sections 4 and 5 of the "Royal Institute of Chartered Surveyors (RICS) Guidance Note 63/2010 Building surveys and technical due diligence"; and
 - ii. "AS 4349 Inspection of Buildings – General Requirements", and with specific regard to the heritage elements.
- (b) The Contractor's reports on condition surveys of buildings must as a minimum record the following features and include dated photographs:
- i. major features of the buildings and developments including location, type, construction, age and present condition, including any defects or damage;
 - ii. type of foundations including columns, walls and retaining structures;
 - iii. an assessment of the susceptibility of the building to further movement or stress;
 - iv. an assessment of the effectiveness of water-proofing systems in basements to the anticipated movements caused by the Contractor's Activities; and
 - v. an assessment of the susceptibility of the building to changes in water levels resulting from the Contractor's Activities.
- (c) Existing levels of aesthetic damage are to be recorded in accordance with the assessment requirements of "Building Damage Classification", by Burland et al, 1977 and Boscardin and Cording, 1989 or another similar or equivalent assessment method to the satisfaction of the Principal's Representative.

- (d) The condition surveys must be carried out by an independent and appropriately qualified and experienced assess for the specific property being assessed.

11.3. Design and Construction

11.3.1. Pre-Construction Land Surveys

The Contractor must verify survey control for the Contractor's Activities and must:

- (a) avoid, where reasonably possible, disturbance of existing survey marks and must re-establish any such marks disturbed or affected by the Contractor's Activities;
- (b) carry out boundary and engineering surveys in accordance with the Surveying and Spatial Information Act 2002 (NSW) and the Surveying and Spatial Information Regulation 2012 (NSW);
- (c) prior to commencing any activity which could affect existing infrastructure (including roads, railways, utility services and buildings), undertake a survey to identify and record the location of the construction site boundary in relation to existing infrastructure; and
- (d) provide the Principal with reports on the location of the construction site boundary in relation to existing infrastructure prior to commencing the relevant Contractor's Activities.

11.3.2. Design Documents

The Contractor must clearly identify property boundaries on drawings it produces in respect of the design of the Works and Temporary Works.

11.3.3. Property Requirements as Part of Site Inductions

- (a) The Contractor must ensure its employees and the employees of Subcontractors engaged in carrying out the Contractor's Activities on the Site are inducted and trained in any property requirements of the Contract to achieve a level of awareness and competence appropriate to their assigned activities.
- (b) The property requirements of the induction must include informing the relevant persons of Site boundaries, parking and vehicle delivery restrictions, Third Party Agreements, limitation of access rights and access procedures to minimise all potential property impacts including property damage, disturbance and any other property matters.

11.3.4. Property Records

The Contractor must provide the following records:

- (a) List of who holds issued documents on a register of current document issue/revisions;
- (b) Index of all property records (prior to the date of completion);
- (c) Personnel and provider qualifications/skills and competency records;
- (d) Induction and training records;
- (e) Property control and constraints maps (worksite maps);
- (f) Identified property stakeholders within the complaints list as identified by the Principal;

- (g) List of all adjoining property owners and details of all interaction / communications;
- (h) Evidence of property inputs/outputs within the design development process including any sustainability initiatives;
- (i) Surveillance, audit of subcontractors property performance and controls;
- (j) Contractor's non-conformance reports and register; and
- (k) Transport projects property non-compliance reports.

11.3.5. Construction Phase Monitoring

- (a) The Contractor must implement a monitoring and inspection regime for properties with the potential to be detrimentally or negatively affected by the Contractor's Activities. The monitoring and inspection regime must address the requirements of the Contract, the Planning Approvals and Third Party Agreements and agreements made with any Authority.
- (b) For activities in or adjacent to the Rail Corridor, the Contractor must implement specific monitoring regimes and emergency and response procedures for all Contractor's Activities close to or under, and likely to affect, live rail track in accordance with relevant monitoring Codes and Standards.

11.3.6. Planning Consistency Checks

- (a) Consistency checklists, in the format provided by the Principal unless otherwise agreed, are to be completed by the Contractor and provided to the Principal's Representative for review in accordance with the requirements of the Contract in circumstances where project works are likely to deviate from the approved project.
- (b) Should the Works be found not to be consistent with the approved project, the Contractor may request the Principal seek a project modification. Under such circumstances, it is the Contractor's responsibility to provide the necessary reports, studies and final submission to the Principal to justify the modification. Any modification must detail property impacts.

11.3.7. Works to be constructed within the boundaries

- (a) The Contractor must ensure that the Works are constructed within the property boundaries (including air or subsurface stratum) of the Site.
- (b) The Contractor must:
 - i. procure for itself and at its own cost the occupation or use of or relevant rights over any land or buildings in addition to the Site, including any land owned by RailCorp or other property owner, which is necessary or which it may require for the purposes of carrying out the Contractor's Activities; and
 - ii. at its own cost carry out all activities and procure all Services necessary to make the land or buildings suitable for use by the Contractor.

11.4. Property Risk Assessment

- (a) The Contractor must undertake a comprehensive and site-specific property risk assessment in conjunction with the Contractor's construction personnel and in consultation with the Property Representative, prior to the commencement of early works (including pre- construction works).

- (b) A staged risk assessment may be utilised, upon agreement with the Principal. This risk assessment must identify the property aspects and actual and potential property impacts of the Contractor's Activities and the control measures that are required to be implemented in order to provide property protection in accordance with the requirements of the Contract. With respect to the Site (and where the Site is at more than one location, for each part of the Site).
- (c) This risk assessment is to include:
- i. potential damage to property and related infrastructure such as roads and footpaths etc. Factors to consider when determining an asset's susceptibility to damage must include maximum levels of movement or angular distortion, or strain, or settlement or deflection or groundwater draw down;
 - ii. permanent and temporary worksite access requirements and timing;
 - iii. access to or across adjoining properties and timing;
 - iv. crane swings, air rights and impacts on neighbouring properties or the Rail Corridor;
 - v. access to Utility Services;
 - vi. any future subdivision, easements, other title interests or divestment requirements;
 - vii. any future commercial impacts of resultant works; and
 - viii. site investigation and contamination.

11.5. Property Compliance Checklist

The Contractor must prepare and submit to the Property Representative, the property compliance checklist plus supporting documents contained in Annexure B: Property Compliance Checklist, to demonstrate that all legal and contractual property related obligations have been met. The checklist must be submitted:

- (a) 10 Business Days prior to site occupation; and
- (b) 10 Business Days prior to construction commencement.

Annexure A: List of Reference Documents

- TfNSW Sydney Metro Risk Management Standard SM RM-ST-201
- TfNSW Audit and Compliance Standard SM QM-ST-202
- TfNSW's "Coordinating and Reporting of AEOC Critical Resources through P6" 4TP-PR-172
- Sydney Trains Project Criticality Form PDM-210-FR-1
- Sydney Trains Project Criticality Assessment Process PDM-210-PR-1

Annexure B: Property Compliance Checklist

Property Compliance Checklist Pre-Site Occupation/Pre-Construction Commencement:

Compiled by:	
On behalf of:	
Contract #:	
Date:	

#	Issue	Circle relevant answer and add comment	Attachment
1	Has the Contractor been liaising with the Principal's Property Manager?	Y N n/a Comment: [insert text here]	
2	Have all properties affected by the project been identified?	Y N n/a Comment: [insert text here]	
3	Has a list of all affected properties been issued to the Principal?	Y N n/a Comment: [insert text here]	
4	Are all properties owned by the Principal?	Y N n/a Comment: [insert text here]	
5	Is access required to properties owned by other parties?	Y N n/a Comment: [insert text here]	
6	Are all agreements in place with other landowners to permit the contractor to undertake the works?	Y N n/a Comment: [insert text here]	
7	Have all surveys been conducted?	Y N n/a Comment: [insert text here]	
8	Have all surveys been cross-checked with the designs?	Y N n/a Comment: [insert text here]	
9	Do any of the proposed works fall outside the property/site boundaries?	Y N n/a Comment: [insert text here]	
10	If so, has the Contractor got agreements to build on the adjoining land?	Y N n/a Comment: [insert text here]	
11	Are new easements, stratum, MOUs or WADs with stakeholders required for the project?	Y N n/a Comment: [insert text here]	
12	Have any new easement, stratum, MOUs or WADs been drafted and issued to the Principal for review?	Y N n/a Comment: [insert text here]	
13	Have all property Pre-Condition Surveys been conducted and submitted?	Y N n/a Comment: [insert text here]	
14	Has the Asset Management Plan been considered in design?	Y N n/a Comment: [insert text here]	
15	Are there any other property risks?	Y N n/a Comment: [insert text here]	

RECEIVED by TfNSW	
Signed:	
Received by:	
Date:	
REVIEWED by Property Representative	
Signed:	
Name:	
Date:	
Acceptable? (Conforms to contract requirements): Y/N provide reasons:	
Comments provided: Y/N (attach comments)	
No Comments or no further Comments: Y/N	



Transport
for NSW

Sydney Metro Requirements – Workforce Development & Industry Participation – SYAB (SMR W)

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Table of Contents

1. Introduction.....	3
2. Workforce Development & Industry Participation Requirements.....	3
3. Sustainable Procurement.....	5
4. Reporting Requirements	5
Annexure A: Reference Documents	7

1. Introduction

1.1. Purpose

This Sydney Metro Requirement – Workforce Development and Industry Participation - SYAB (SMR W) describes specific requirements and processes the Contractor must comply with. This SMR W must be read in conjunction with the Contract.

1.2. Interpretation

Unless identified otherwise, wherever used in this SMR W, words and phrases have the meaning given to them in the General Conditions or the SMR Prelude.

2. Workforce Development & Industry Participation Requirements

2.1. General Requirements

- (a) The Contractor must develop, implement and maintain governance structures, processes and systems that ensure integration of the workforce development and industry participation requirements during the Contractor's Activities as they apply across the Supply Chain and include them in the specific related Management Plans detailed in SMR PA.
- (b) The Contractor must nominate a workforce development and industry participation resource to establish, monitor and implement strategies relating to workforce development and industry participation.
- (c) The Contractor must assess current and future workforce development and industry participation needs and must submit to the Principal's Representative, the following completed templates for review in accordance with the Contract:
 - i. a completed Workforce Profile and Gap Plan Template, 60 Business Days after the Contract date;
 - ii. a completed SYAB Workforce Development Output Delivery Profile Template, 60 Business Days after the Contract date;
 - iii. estimated Workforce numbers that will participate in the Sydney Metro Industry Curriculum Program, 60 Business Days after the Contract date;
 - iv. prior to Completion, a NSW APiC Aboriginal Participation Report Template; and
 - v. a NSW APiC Aboriginal Participation Plan Template, 60 Business Days after the Contract Date.
- (d) The Contractor must ensure that employment conditions for all Trainees and Apprentices meet or exceed the obligations and expectations of the National Code of Good Practice for Australian Apprenticeships, including pay rates reflecting individual awards or the national minimum wage for Trainees where no award or agreement exists.
- (e) The Contractor must comply with the Reference Documents listed in Annexure A.

- (f) The requirements defined in this document SMR W apply across the Supply Chain.
- (g) The Contractor is also encouraged to:
 - i. provide employment opportunities for Apprentices and Trainees; and
 - ii. participate in meetings and working groups relating to Sydney Metro City & Southwest Skills and Employment Advisory Group (SEAG) and relevant subgroups.

2.2. Workforce Development & Industry Participation Outputs

- (a) The Contractor must, as a minimum:
 - i. engage a minimum of 5 Australian and New Zealand Small and Medium Enterprises (ANZ SME) in the Supply Chain;
 - ii. ensure that a minimum of 3 ANZ SMEs in the Supply Chain must be Local ANZ SMEs;
 - iii. ensure that a minimum of two of the 5 ANZ SMEs in the Supply Chain are Certified Aboriginal Businesses;
 - iv. ensure that 20% of the total Workforce are Local; and
 - v. ensure that 2.5% of the total Workforce are Aboriginal.
- (b) All job Vacancies in the Workforce must be posted on the Sydney Metro website (Job Portal pages).

2.3. Mandatory Training Requirements

- a) All of the Workforce is required to complete Sydney Metro Orientation Training prior to commencement on Site.
- b) In addition, the Contractor must participate in, and comply with, the Sydney Metro Industry Curriculum (SMIC) Program provided by the Principal through Industry Curriculum Training Providers. The Contractor must ensure, unless otherwise exempt under the SMIC:
 - i. All Civil Construction workers to attend the Civil Construction Introduction Skills course;
 - ii. All Civil Construction Supervisors to attend the Civil Construction Introduction to Leadership course;
 - iii. All workers who provide Work Site Protection are to attend the Rail Introduction Skills course and Rail Introduction to Leadership course;
 - iv. All Supervisors who are Rail Safety Workers are required to complete the Rail Introduction to Leadership course;
 - v. all New Entrants to the Demolition industry attend the Demolition, Introductory Skills course;

- vi. all workers with previous Demolition experience, who are not in a Supervisor role attend the Demolition, Experienced Worker course;
 - vii. all Demolition Supervisors attend the Nominated Supervisor Course;
 - viii. all Frequent Heavy Vehicle Drivers attend the Heavy Haulage Introduction Skills course;
 - ix. all workers in a Supervisor role attend the Cultural Awareness Training to be delivered by a Certified Aboriginal Business.
- (c) All training in the programs listed in clause (b) i. to ix. above must be completed, to the extent they apply, prior to the individuals commencing on the Site unless otherwise stated in the SMIC Program.

3. Sustainable Procurement

The Contractor must:

- (a) include workforce development and industry participation requirements in the selection process for its Subcontractors;
- (b) identify and implement sustainable procurement initiatives that provide environmental and social improvement and maximise opportunities for ANZ SMEs;
- (c) advertise all procurement opportunities through the Industry Capability Network Gateway <http://www.icn.org.au>
- (d) provide the Principal all relevant information in order for TfNSW to be able to comply with the *Australian Jobs Act 2013* and other relevant Government requirements;
- (e) comply with the NSW Aboriginal Participation in Construction Policy May 2015; and
- (f) comply with the NSW Procurement Directive PBD-2016-02.

4. Reporting Requirements

- (a) The Contractor must submit a progress report on a monthly basis, to the Principal's Representative for review in accordance with the Contract. The monthly report must be in accordance with the Sydney Metro City and Southwest Workforce Reporting Template SM ES FT – 422.
- (b) The Contractor's monthly progress report must contain the information listed in i to xii below:
 - i. progress against the requirements of clause 2.2.(a) of this SMR W;
 - ii. current Workforce status under the headings listed in A to G:
 - A. total Workforce;
 - B. Local jobs;
 - C. Aboriginals in the Workforce;
 - D. gender ratio and numbers in the Workforce;
 - E. Apprentices with over 26 weeks employment on this project;
 - F. Trainees with over 26 weeks employment on this project; and

- G. Aboriginal Apprentices and Trainees with over 26 weeks employment on this project.
- iii. numbers of all Apprentices and Trainees employed on the project, regardless of duration;
 - iv. the proportion of the Workforce participating in Nationally Recognised Accredited Training;
 - v. the proportion of the Workforce represented in the following groups, under the following headings:
 - A. women in Non-Traditional Trades;
 - B. women in senior leadership and management roles;
 - C. young people under the age of 25 years;
 - D. Long Term Unemployed;
 - E. Mature Aged Workers;
 - F. people with a registered Disability; and
 - G. young people under the age of 25 years, who have been out of education or training for six months or more.
 - vi. the number of ANZ SMEs participating in the Supply Chain;
 - vii. the number of Local ANZ SMEs participating in the Supply Chain;
 - viii. the number of Certified Aboriginal Businesses participating in the Supply Chain;
 - ix. details of the Workforce participating in the Sydney Metro Industry Curriculum Program;
 - x. details of the Workforce participating in the Pre-Employment Program;
 - xi. details of the Workforce participating in all Sydney Metro Workforce Development Programs; and
 - xii. details of any additional Nationally Recognised Accredited Training undertaken by the Workforce.
- (c) Randomly selected data from the monthly report will be verified on a quarterly basis. Contractors must provide the Principal with evidence associated with the reporting data when requested by the Principal's Representative.

Annexure A: Reference Documents

- Sydney Metro City and Southwest Workforce Reporting Template SM ES FT - 422
- Workforce Profile and Gap Plan Template SM ES-FT-424
- SYAB Workforce Development Output Delivery Profile Template SM ES-FT-424
- NSW APiC Aboriginal Participation Report Template. SM ES-FT 427
- NSW APiC Aboriginal Participation Plan Template SM ES-FT-426
- Sydney Metro City & Southwest Industry Curriculum Guide - SM ES-FT-430
- NSW Aboriginal Participation in Construction Policy May 2015
http://www.procurepoint.nsw.gov.au/system/files/documents/apic_policy_1_may_2015.pdf
- NSW Procurement Directive PBD-2016-02 <https://arp.nsw.gov.au/pbd-2016-02-construction-apprenticeships>

Schedule D2. Initial Management Plans & Methodologies

(Clause 2.14)

This Schedule D2 consists of:

- a) Attachment 1 – Initial Workplace Relations Management Plan;
- b) Attachment 2 – Initial Work Health Safety Management Plan;
- c) Attachment 3 – Initial Workforce Development and Industry Participation Plan;
- d) Attachment 4 – Initial Safety Assurance Plan; and
- e) Attachment 5 – Methodologies.

Attachment 1 – Workplace Relations Management Plan

Sydney Metro City and Southwest Sydney Yard Access Bridge Attachment 20.1: Workplace Relations Management Plan

Document and revision history

Document details	
Title	Workplace Relations Management Plan
Client	Transport for NSW (TfNSW)
Client reference no.	TfNSW Contract No. SMCSW-141
Laing O'Rourke contract no.	

Revisions

Version	Date	Description	Prepared by	Approved by
1	28/07/16	Draft issued for tender	L. Olsson	A. Nolan

Management reviews

Review date	Details	Reviewed by

Controlled: NO Copy no.: Uncontrolled: YES

Note: This plan is a draft and will be reviewed subject to the advice that Laing O'Rourke is the preferred tenderer.

20.1

Terms and definitions

The following terms, abbreviations and definitions are used in this plan.

Term	Explanation
AWU	Australian Workers Union
CCU	Construction Compliance Unit
CFMEU	Construction, Forestry, Mining and Energy Union
EAP	Employee Assistance Programme
ER	employee relations
FWBC	Fair Work Building and Construction
IR	industrial relations
KPI	key performance indicator
ROI	registration of interest
SYAB	Sydney Metro City and Southwest Sydney Yard Access Bridge
WHS	work health and safety
WRMP	Workplace Relations Management Plan

Table 1: Terms and definitions

Contents

1. Purpose and objectives	4
2. Compliance and audit	4
3. Track record	4
4. Model Workplace Relations Management Plan	5
Part A: Administration.....	5
Part B: Risk assessment.....	8
Part C: Site establishment.....	11
Part D: Subcontractor management.....	12
Part E: Conditions of employment.....	17
Part F: Recruitment of direct labour.....	17
Part G: Induction and mobilisation.....	18
Part H: Labour productivity.....	19
Part I: Performance metrics.....	23
Part J: Freedom of association.....	26
Part K: Right of entry.....	27
Part L: Grievance management.....	29
Part M: Management of unlawful industrial action.....	29
Part N: Audit and Review.....	31
Appendix 1: Summary of freedom of association objectives and prohibitions.....	33
Appendix 2: Contracts of employment.....	34
Appendix 3: Management of unlawful industrial action.....	36

20.1

1. Purpose and objectives

The New South Wales Government wishes to encourage greater flexibility and productivity within the State's building and construction industry and to ensure that the New South Wales Government maximises value for money on its spending on infrastructure projects. To that end, the New South Wales Government has introduced Implementation Guidelines to the New South Wales Code of Practice for the Building and Construction Industry that take effect from 1 July 2013 (the Guidelines). See the CCU's website for the latest version of the Guidelines, published July 2013.

Section 5.1 of the Guidelines requires that for projects where the New South Wales Government contributes \$10 million or more (or where the New South Wales Government contributes at least \$5 million and this represents at least 50 per cent of the project's value), any tender response or expression of interest must be accompanied by a Workplace Relations Management Plan (the WRMP).

2. Compliance and audit

The Treasurer and Minister for Industrial Relations New South Wales has overall responsibility for the implementation of the Guidelines, and has established the Construction Code Compliance Unit ('the CCU') to monitor compliance with the Guidelines and to receive reports of any alleged breaches.

The CCU will conduct both desktop and field audits and inspections as part of its compliance and assurance obligations. Where a tenderer is required to submit a WRMP, the CCU's primary audit focus will be against the WRMP. Tenderers should be cognisant of this when developing and implementing their WRMPs.

3. Track record

On time and on budget

Section 6.1 (d) of the Guidelines requires that tenderers must demonstrate that they have a track record of delivering construction projects on time and on budget. In satisfying this obligation, tenderers should provide a summary of all projects completed in New South Wales over the last three years, indicating the completion cost and date as at the time of tender, and the actual completion cost and date of completion. Where delay and cost escalation has occurred as a result of industrial relations matters, the tenderer must advise details of the reasons for the failure, and the steps that it has taken to address those failures. Those steps should be specific and measurable, and may be the subject of CCU audit and verification.

The following table summarises the projects Laing O'Rourke has completed in New South Wales over the past three years.

Project	Completion cost	Date of completion	Any delay and cost escalations as a result of IR matters?
Auburn Stabling Project Stage 1	\$65m	January 2014	Nil
Sydney Port Botany Terminal 3	\$160m	May 2014	Nil
NCIG Rail Flyover	\$8.5m	May 2015	Nil
Sydney Airport T1 Northern Concourse Expansion	\$18m	September 2015	Nil
Moorebank Units Relocation	\$870m	October 2015	Nil
Clinical Services Building – Blacktown Hospital	\$146m	February 2016	Nil
Sydney Light Rail Early Works	\$82m	February 2016	Nil

Table 2: Laing O'Rourke's recently completed NSW projects

Efficient and productive work practices

Section 6.1 (e) of the Guidelines requires that tenderers must demonstrate that they have a track record of adopting efficient and productive work practices. In satisfying this obligation, tenderers should provide actual labour productivity data including labour efficiencies and output per labour hour, or similar objective, verifiable and precise data. Tenderers should provide actual examples where above average labour productivity has been achieved, and what initiatives underpinned that performance. Where tenderers are unable to demonstrate previous performance in this area, they should advise what steps are being taken or are proposed to achieve improved performance. Those steps should be specific and measurable, and may be the subject of CCU audit and verification.

Laing O'Rourke plans work on all its project sites to optimise productivity. In doing so, we deploy a number of mechanisms to ensure the sites operate smoothly, consistently and efficiently. These mechanisms include:

- Planning extensively and collaboratively, including using Digital Engineering mediums to communicate with all members of the project team
- Optimising the use of technology and plant
- Selecting systems that can be assembled in big pieces with reduced labour
- Implementing off-site manufacture and prefabrication in controlled conditions
- Conducting regular structured performance analysis
- Recognising and rewarding productivity.

The following table contains sample data from recent projects, identifying high-production trades and the actions taken that facilitated their success.

Project	Actual labour productivity data	How was it achieved
Auburn Stabling Project Stage 1	300m ³ earthworks per man per day	<ul style="list-style-type: none"> • Detailed advance planning with other activities • Use of GPS survey on plant to remove the person–plant interface safety hazard, allowing larger and more efficient plant to be used and less labour to deliver outputs.
Griffith University Health Centre	370m ² fit-out per week	<ul style="list-style-type: none"> • Detailed advance planning between teams • Application of Laing O'Rourke's Week Beat methodology to fit-out • Rigid time management.

Table 3: Sample data for recent projects

4. Model Workplace Relations Management Plan

The model Workplace Relations Management Plan (WRMP) is intended to provide tenderers with an overview of the CCU's expectations of an effective and auditable WRMP. Use of the pro forma is not mandated, but if departing significantly from the suggested layout and content, tenderers are advised to contact the CCU to discuss their proposed approach.

Part A: Administration

The purpose of this section is to outline the organisational structure for the project, including the identification of staff, reporting lines and responsibilities, with particular emphasis on those roles and responsibilities which affect labour productivity and compliance with the Code, including reporting in accordance with Section 3.5(c) of the Guidelines.

Where the Project intends to rely on external support, such as consultants, solicitors or employer associations, the details of those persons and organisations should be included. Where there is a significant use of subcontractors, the organisational structure should nominate who is responsible for subcontractor management in accordance with Part D.

Laing O'Rourke's organisational structure for the Sydney Metro City and Southwest Sydney Yard Access Bridge (SYAB) project has been created to ensure high levels of productivity and compliance with the Code, including reporting in accordance with Section 3.5 (c) of the NSW Implementation Guidelines (the Guidelines). The senior members of our team will include:

- Project Director
- Project Manager
- Construction Manager.

They are experienced in the construction of complex major projects, as well as compliance with the national code.

The Project Manager will have overall responsibility for the management of industrial relations (IR) and work health and safety (WHS). They will also be responsible for maximising productivity on site with the direct support of the Construction Manager, who will support the Project Manager with his day-to-day responsibility.

To meet these responsibilities, they will endeavour to:

- Ensure all levels of management and employees understand and are accountable for their employee relations (ER) and IR responsibilities
- Ensure the enforcement of the union right of entry requirements in accordance with the *Fair Work Act 2009* and *Work Health and Safety Act 2011*
- Encourage and support open two-way communication between management and the workforce
- Develop and maintain constructive relationships with employees, unions and other contractors, subcontractors and other institutions on industrial relations issues that may directly or indirectly affect Laing O'Rourke's operations and/or the project
- Operate in accordance with the applicable legislation, regulations, codes and guidelines
- Ensure site inductions are conducted by site management and in strict accordance with the Guidelines
- Ensure the rights of freedom of association under the Fair Work Act and the objectives of the Guidelines, outlined in Appendix 1, are complied with by all parties
- Ensure staff and subcontractors are aware of and understand their legal obligations under the Fair Work Act and the Guidelines in respect to the prohibitions against sham contracting arrangements and improper conduct in the making of workplace arrangements and over-award payments
- Ensure contractors, subcontractors and suppliers are made aware of and are legally obligated under contract to comply with the Guidelines and Laing O'Rourke's Workplace Relations Management Plan
- Identify possible IR areas of conflict before they arise and implement appropriate strategies accordingly
- Apply sound IR principles to resolve grievances and disputes in accordance with the relevant dispute settlement clause requirements of the Fair Work Act to prevent industrial action that adversely affects, or has the potential to adversely affect, the delivery of the project or other related contracts on time and budget
- Record and report within 24 hours to the client and Construction Compliance Unit (CCU) on all workplace relations and WHS matters affecting the site, project costs, related contracts and timelines. Additionally as required, appropriately report to Fair Work Building and Construction (FWBC) on industrial relations and WHS matters affecting the project
- Ensure that subcontractors are made aware of and remain compliant with Laing O'Rourke's project-specific WHS Management Plan, Communications Plan and Environmental Management Plan
- Prevent practices that are inconsistent with the Guidelines that include the requirement for any employer on the project to apply union or any other logos, mottos or other indicia to a

company's property or equipment, including clothing unless allowed for under an approved enterprise agreement

- Commit sufficient resources for the effective implementation of industrial relations management systems in all areas of Laing O'Rourke's operations and/or the project
- Ensure the workforce is suitably skilled to undertake the duties for which they are employed in a safe and productive manner
- Maintain a programme of education and training to enhance skills and to increase employee and industrial relations and WHS awareness for monitoring compliance to the respective governments' Codes and Implementation Guidelines.

Laing O'Rourke's approach to ER and IR has been designed to maintain a productive industrial environment. To directly support and assist the delivery team with our key task of labour productivity and compliance, Laing O'Rourke has appointed an experienced Project Manager and Construction Manager. They will in turn be supported by our Regional Employee and Industrial Relations Manager, who is experienced in dealing with the New South Wales unions and IR landscape.

The following table sets out the legal advisors and consultants that will be used on the project:

Consultants/Legal advisors	Details
Mills Oakley	Provision of legal services and advice in relation to ER, IR and WHS
Australian Industry Group	Provision of consulting advice in relation to ER and IR
Master Builders Association of NSW	Provision of consulting advice in relation to IR
Master Builders Association of NSW	Provision of contractor IR compliance audits

Table 4: Legal advisors and consultants to be engaged on the project

Laing O'Rourke's proposed organisational structure is shown below.

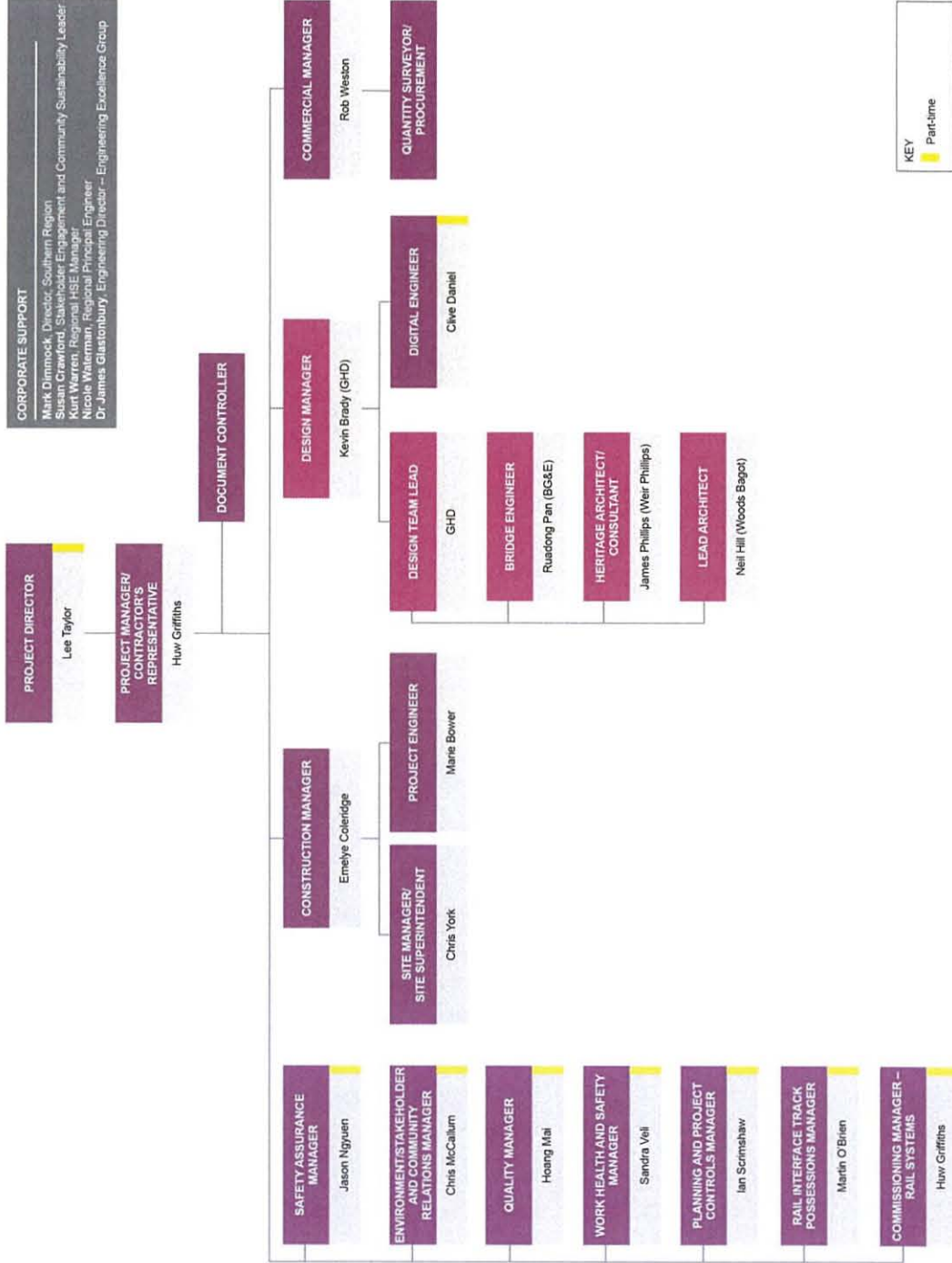


Figure 1. SYAB organisational chart

Part B: Risk assessment

The purpose of this section is to obtain the tenderer's view on the industrial relations risks that the project might face.

The risk assessment should demonstrate an understanding of the industrial relations environment, lessons from previous projects and project-specific issues. Where there is off-site fabrication or modularisation involved in the delivery strategy, the risk assessment should include industrial relations risk associated with procurement, including transport. The risk assessment should explicitly identify issues that will affect the tenderer's ability to comply with the Code and Guidelines and also identify any barriers to meeting their objectives of efficiency and productivity.

Industrial relations risks

The following table outlines the major IR risks that Laing O'Rourke believes will be faced on the SYAB project as well as the strategies we will employ to mitigate these risks.

Risk	Description	Mitigating steps
Union right of entry	Unions seeking to enter the site in breach of the right of entry requirements under the <i>Fair Work Act 2009</i> and <i>Work Health and Safety Act 2011</i> .	<ul style="list-style-type: none"> Clearly communicate to the state construction union that Laing O'Rourke, without exception, requires union officials to fully comply with the right of entry requirements under the Fair Work Act and Work Health and Safety Act and to meet the WHS standards and security protocols to enter site Provide training and development programmes for site management and supervisors to ensure they understand the requirements and obligations under Fair Work Act, Work Health and Safety Act and NSW Implementation Guidelines Enforce union right of entry requirements in accordance with the Fair Work Act and Work Health and Safety Act Establish appropriate systems and registers for recording right of entry Maintain communication channels with relevant union, employees and subcontractors Access internal and external advice to support the project as required <p>Establish a reporting system to notify the client, CCU and FWBC of any union right of entry breaches and Laing O'Rourke's course of action.</p>
Subcontractor engagement	The engagement of subcontractors is one of the largest risks faced by Laing O'Rourke. It may impact Code and Guidelines compliance by virtue of the inability of subcontractors to fulfil their IR, Code and Guidelines commitments and to financially manage their businesses.	<ul style="list-style-type: none"> Use subcontractors that are known to the project team and have a known and proven track record of compliance with IR, Fair Work Act, Code, Guidelines and WHS requirements Undertake a detailed audit of all subcontractors prior to engagement to ensure IR performance and compliance with the Fair Work Act, the Code and the Guidelines During the course of the project, conduct regular IR audits to monitor each subcontractor's compliance with the Code, the Guidelines, industrial instruments and employment statutes.
Management of legal obligations relating to employment	Ensuring all relevant parties comply with the provisions of the applicable awards and workplace arrangements that have been certified registered or otherwise approved under the relevant IR legislation, as well as other legislative requirements.	<ul style="list-style-type: none"> During the course of the delivery of the project, undertake regular audits to assess whether all the relevant parties remain in compliance with their legal obligations relating to employment and the relevant Codes and NSW Implementation Guidelines.
Non-compliance	All parties are required to resolve	<ul style="list-style-type: none"> Ensure all parties are aware of their legal obligations to

20.1

Risk	Description	Mitigating steps
with industrial disputes settlement procedures	grievances or disputes with their employees and applicable unions in accordance with the relevant award or workplace agreement based on the Fair Work Act's "Model – Dispute Settlement Procedure".	<ul style="list-style-type: none"> comply with their relevant award or workplace agreement Industrial Relations Dispute Resolution Procedure, which is to be based on the Fair Work Act's "Model – Dispute Settlement Procedure" Apply sound IR principles to resolve grievances and disputes to prevent industrial action that adversely affects, or has the potential to adversely affect, the delivery of the project or other related contracts on time and budget.
Union claim for a site allowance/project agreement	Unions making a claim for the contractor and subcontractors to pay a site-specific allowance/project agreement in breach of the "no extra claims" provision of enterprise agreements.	<ul style="list-style-type: none"> Unless approved by the client, deal with such claims legally by having any unlawful industrial action being referred to the Fair Work Commission and, if required, the Federal Court to enforce the orders against the unions.
Unions using safety as an industrial weapon to adversely affect the delivery of the project or other related contracts on time and budget	Unions seeking to enter the site on the premise of an alleged safety issue in breach of the right of entry requirements under the Fair Work Act and Work Health and Safety Act.	<ul style="list-style-type: none"> Provide training and development programmes for site management and supervisors to ensure they understand, and can put into practice, the requirements and obligations of unions under Fair Work Act and Work Health and Safety Act in respect to right of entry Enforce right of entry requirements in accordance with the Fair Work Act and Work Health and Safety Act Ensure site management and supervisors understand and can put into practice the process for managing an alleged safety dispute in accordance with the project's safety dispute procedure Proactively ensure that at all times site amenities and the general safety of the site are fully compliant with the Work Health and Safety Act, WorkCover WHS Codes of Practice for the construction industry, and the project's Work Health and Safety Management Plan and Emergency Response Plans Ensure the site's security system firmly controls access to prevent unauthorised persons entering the construction site zones.
Unauthorised sub-subcontracting of contracts by subcontractors and prevention of sham contracting	Subcontractors splintering their contracted works to lower tier subcontractors without the authority of the principal contractor, thereby avoiding being scrutinised for their compliance to the Code and Guidelines and Fair Work Act. This in turn exposes the project to high-level IR risk and union industrial action on allegations of "sham contracting".	<ul style="list-style-type: none"> Include a clause in commercial subcontracts that legally prohibits the subcontractor from sub-subcontracting any of its contracted works without authorisation and vetting by the principal Vet all subcontractors that Laing O'Rourke intends to use and make it a condition of tender to disclose to whether the subcontractor intends to sub-subcontract any of its contracted works Undertake a detailed audit of all subcontractors and sub-subcontractors prior to engagement to ensure IR performance and compliance with the Fair Work Act, the Code and the Guidelines During the course of the project, conduct regular IR audits to monitor each subcontractor's compliance to the Code, the Guidelines, industrial instruments and employment statutes.
Renegotiation of enterprise agreements	During the construction phase of the project, a significant number of contractors and subcontractors will endeavour to renegotiate their	<ul style="list-style-type: none"> Proactively commence the renegotiation of the enterprise agreements well before their respective expiry dates Strictly follow the FWA – in Good Faith Bargaining

Risk	Description	Mitigating steps
	union enterprise agreements without exposing the project to lawful protective industrial action.	Process.
Managing use of time in periods of inclement weather	Lost productivity opportunities caused by the indiscriminate use of the inclement weather provisions.	<ul style="list-style-type: none"> • Implement an inclement weather assessment process to understand anticipated severity and duration of inclement weather in a timely manner • Establish "ready to go" training packages in advance, that can be delivered by on-site resources at short notice.

Table 5: Major IR risks identified for the SYAB project

Part C: Site establishment

The purpose of this section is to outline how the tenderer intends to establish the site(s). Issues that may affect labour productivity will include access control and security; parking and commuting issues; and how employees will move from the access point(s) to amenities and to and from the workforce. For remote sites, the tenderer should address issues of accommodation and transport.

The WRMP should show how the tenderer intends to ensure that any preparatory works including security, site clearance, fencing, utilities supply and the establishment of offices, amenities and lay down areas are carried out productively and in compliance with the overall objectives of the Guidelines.

Laing O'Rourke will establish all worksites for this project in accordance with our Primary Standard 11: Site Establishment and Logistics, which outlines requirements for all Laing O'Rourke project worksites. A carefully planned and coordinated logistics and site establishment plan is crucial in setting the overall tone and attitude for project success.

All Laing O'Rourke project worksites have clear, robust and concise standards for the arrangement, establishment and management of materials, equipment, people and overall logistical concerns.

Facilities will be safe and their presentation well-maintained to represent Laing O'Rourke's professional standing. Our projects are established methodically in a safe and supported manner to enhance our ability to efficiently deliver the works.

Loading and unloading areas and temporary lay-down areas are a critical aspect of the construction process and should not be confused with the storage of materials. Lay-down areas support those construction works that require materials or components to be cycled in and out of the works area. As such, the lay-down areas need to be kept clear for such reasons. To facilitate the servicing of the worksite during the construction phase, these areas must have free access by crane, crane truck, forklift or other site plant.

When goods are to be delivered to site on "self-sufficient" transport (such as trucks with mounted cranes), Laing O'Rourke will implement the requirements of Primary Standard 17: Cranes and Lifting and also Primary Standard 4: Loading and Offloading Vehicles.

Storage of material will be driven by consumption with a "just-in-time" mindset from the outset of the project. We will also assess the feasibility of off-site storage facilities. Storage areas will be neat, tidy and well presented, with appropriate segregation and logical storing of equipment and supplies for ease of access. The areas will be located in the proximity of the "live" workforce; however, they will not hinder the progression of any works but instead create ease and convenience for all contractors interacting with the workforce. The storage areas will be easily and safely accessible by internal vehicle access paths and pedestrian access ways at all times, with clear and concise signage appropriately separating hazardous materials as necessary. As the works progress, storage areas will be repositioned to better facilitate the changing workfronts. This will be timed to prevent any disruption to the programmed works.

Wherever possible, stored items will be moved around the site by a forklift, crane truck, builders hoist or goods lift to reduce manual handling. Both personnel and material hoists may be employed to provide quick and efficient means of transport to work areas. Forklifts will be employed as the workhorse of the project, primarily servicing the unloading and distribution of material to lay-down or work front areas. All lifting and materials handling equipment will be sized and located specifically to support the work coverage and equally support storage, placement, lay-down and handling areas.

Additionally all work areas will implement the requirements set out in Primary Standard 5: Pedestrian and Site Access Routes. This standard provides instructions on setting up pedestrian and site access routes safely, as well as for controlling and marking out access areas to ensure appropriate security.

Walkways at and around our worksites are regularly used by staff and/or the public. As such, they will be carefully set up to minimise risk of injury from slips, trips and falls. Care will be given to implement vehicle and pedestrian segregation. Access points and routes will be clearly marked, appropriately segregated and controlled to prevent unauthorised entry (deliberate or otherwise).

All permanent work areas will have full-perimeter solid site boundary hoarding and/or secure fencing that is installed to provide appropriate, robust and necessary segregation and security between the public and the construction works. The hoarding and/or secure fencing will be designed, installed and maintained to reflect a professional and consistent image, being punctured only at designated locations to provide access and egress from site. The perimeter of all sites will be established to ensure the adequate management and control of all personnel and vehicles entering and exiting the site. This includes the establishment of a physical barrier around the site perimeter that both defines the extent of the Laing O'Rourke site and restricts unauthorised entry.

If required, a Structural Engineer will certify the design and installation of the hoarding structure, inclusive of hoarding fence structures (Class A) and, when installed, the overhead protective structure (Class B). A certificate will be produced in writing by the Structural Engineer and issued to Laing O'Rourke prior to commissioning. It will certify the adequacy of the hoarding to support all imposed loads and that, when installed, the overhead protective structure (Class B) has a rating equal to or greater than 10kPa.

Safety signage will be installed on the hoarding with relevant information displayed for ease of understanding.

Fencing and hoarding to worksites will be erected in accordance with Laing O'Rourke's hoarding guidelines and relevant authority specifications, with appropriate approval received prior to installation.

When established, a consultative site inspection and audit of all worksites will be undertaken with senior members of Laing O'Rourke's leadership team, site labour and subcontractors to engage and gain feedback on the suitability and compliance of the establishment provided.

Part D: Subcontractor management

The purpose of this section is to outline how the tenderer will select and manage subcontractors. The WRMP should outline how the selection and mobilisation of subcontractors is carried out in accordance with the requirements of Section 5.4 of the Guidelines.

The WRMP should demonstrate the process by which subcontractors are pre-qualified, with an emphasis on demonstrating a track record of compliance, the ability to manage grievances, disciplinary matters and administrative capability (payroll etc.).

The WRMP should outline how subcontractor labour productivity will be measured and what steps will be taken to improve performance, including commercial incentives that address and reward productivity.

The WRMP should outline how subcontractor industrial relations issues, including grievances are to be managed and reported to the head contractor. The WRMP should also contain details as to how the head contractor proposes to ensure that the obligations contained at Sections 8.7 – 8.11 of the Guidelines are given effect, including ensuring that subcontracts contain provisions that ensure that:

- Grievances, disputes and industrial action are reported to the head contractor; and
- The subcontractor agrees to take all requisite steps to stop any unlawful industrial action, and to ensure that any damages or penalties are appropriately pursued (refer to Part M).

Introduction

Laing O'Rourke's Core and Enabling Processes are a set of standards and procedures that guide the way we win and deliver projects. This proven quality assurance framework enables us to connect and direct all of the relevant decisions and activities necessary to achieve maximum performance and control across the entire lifecycle of a project, through a series of mandated gateways. Each mandated gateway must be complied with before progress to the next gateway is allowed. Laing O'Rourke, therefore, has established standards and procedures that ensure Code awareness and compliance is embedded in every aspect of the project lifecycle, and Core and Enabling Processes will be applied to the Building Renewal Projects.

Core Process enables employees to fully understand the critical sign-off procedures for bidding and securing a project. It also ensures that risk and opportunity are accurately and reliably assessed for all project matters, including IR, productivity, design, health and safety, and environment. As part of Core Process, IR risk matrixes must be developed before entering into any head contract with a client.

Enabling Process sets out the operational procedures that are mandated and must be followed by our business. It is used to procure, evaluate and select our supply chain partners, including subcontractors and consultants, and it defines the documents required for the pre-tender, tender, contract award and delivery stages of a project.

Key elements of Enabling Process are functional toolkits for our project delivery teams and technical experts such as ER managers. These toolkits enable our people to deploy current best practice procedures consistently, executing project-specific plans in an integrated and disciplined manner. By using Enabling Process, Laing O'Rourke is able to systematically ensure that our projects are resourced with the right toolkits, people and resources to ensure Code compliance.

Prequalification

Laing O'Rourke has a preselection process for engaging with preferred supply chain partners (including subcontractors, suppliers and consultants) for ongoing engagement across multiple projects. As part of our process of appointing companies as "Preferred Supply Chain Partners", companies are asked to complete a detailed questionnaire so that Laing O'Rourke can assess their compliance with the Code, the Guidelines, the Fair Work Act and other any applicable industrial instruments, as well as their track record of compliance and disputes handling process. All companies must also complete a detailed questionnaire regarding WHS.

This questionnaire is then reviewed to ensure Code compliance and that the contractor has a track record of delivery and productivity before a package of work is let.

Further, Laing O'Rourke will generally select subcontractors that have previously worked with or are known to the company and have worked on major projects and have proven themselves capable of:

- Supplying adequate resources to ensure timely delivery
- Maintaining a committed workforce
- Managing employee grievances and union disputes

-
- Driving productivity
 - Managing their workforce while providing a high standard of work
 - Operating in accordance with the applicable legislation, regulations, codes and guidelines.

Tender processes and review

Enabling Process requires our project teams to use a standard suite of tender documents when engaging companies to assist in project delivery. This suite of documents has been prepared so that potential subcontractors and consultants are vetted for compliance with the Code prior to their engagement by Laing O'Rourke. All potential subcontractors and consultants are required to return an Invitation to Tender. In addition to setting out scope of work requirements, the Invitation to Tender is specifically designed to allow Laing O'Rourke to assess a subcontractor's compliance with:

- The New South Wales Code and the Guidelines
- Employment obligations and history under the Fair Work Act
- Industrial instruments
- The Fair Work Principles
- WHS requirements and legislation
- Contractual obligations as prescribed in Laing O'Rourke's standard forms of contract.

The Invitation to Tender suite of documents consists of:

- Invitation to Tender Letter, which incorporates conditions of tendering, based on the "Model Tender and Contract Documentation Implementation Guidelines to the New South Wales Code of Practice for Procurement: Building and Construction" (May 2013)"
- Conditions of contract, evidence of employment and project-related insurance
- Health and safety requirements, including Next Gear – Guide for Supply Chain Partners and questions relating to health, safety, environment and quality (HSEQ)
- Compliance with the Guidelines and the Building Code 2013 (as amended), including Part 1: Questions relating to Building Code and ER, Part 2: Declaration of Compliance (from the Model Tender and Contract Documentation Implementation Guidelines) and Part 3: Compliance with State Code (if applicable).

In addition, the above documents ensure compliance with the NSW Code and related ER and IR matters by addressing and requiring information on:

- ER and IR management
- Industrial instrument coverage
- Engagement of subcontractors, consultants and suppliers
- NSW Code compliance, including compliance with all applicable workplace relations laws, advising of any adverse court or tribunal decisions for breaches of workplace relations law, work health safety and rehabilitation (WHS&R) law, superannuation, industrial instruments or workers' compensation laws, confirmation of WHS&R plans and specific and detailed questions regarding freedom of association.

Contractual documentation

Laing O'Rourke's contracts with supply chain partners set out Laing O'Rourke's responsibility to comply with the Code and the Guidelines on all its projects, as well as obligations for all subcontractors and consultants to be compliant with the Code and Guidelines. No deviations are permitted to these contract terms and conditions without corporate approval, ensuring that all contractors on site are compliant with the Code. Further, under Laing O'Rourke's contractual documentation, subcontractors are required to notify us of any actual or threatened industrial disputes or other employee grievances. This allows Laing O'Rourke to proactively manage such disputes and grievances.

Project compliance implementation

Subcontractor assessment, selection and management will be carried out in accordance with Laing O'Rourke's procurement procedures as outlined above. Further, during the execution of the contract, subcontractors must also declare that they are complying with employment obligations, indicating that all wages due and other amounts payable under legislation, award or workplace agreement to employees have been paid for their contracted section of works as part of their monthly progress claim. Verification of compliance is to be demonstrated through the provision of a written statement verifying compliance. The written statement includes the following:

- Statutory declaration
- Subcontractor statement.

Laing O'Rourke will ensure resources are available on site as well as at the regional level to audit subcontractors' compliance. When requested, subcontractors will be required to allow Laing O'Rourke to verify compliance with legal and employment obligations regarding:

- Payment of wages
- Annual leave entitlements
- Long-service leave registration
- Worker's compensation insurance
- Superannuation fund membership and contributions
- Government codes of practice and related industry guidelines.

In verifying any of the above, Laing O'Rourke will ensure that privacy obligations are complied with.

Proactive engagement and management of subcontractors and consultants

In addition to the processes described above, Laing O'Rourke will proactively ensure subcontractors' compliance by subcontractors with the Building Code 2013 through these steps:

- Once returned by supply chain partners, Invitation to Tender documents are reviewed and assessed by Laing O'Rourke for Code compliance, including the adequacy and accuracy of responses to the questions relating to Building Code and ER, provision of the Declaration of Compliance and Department of Employment letter
- Post-tender interviews and assessments are carried out
- No deviations from the standard form contract terms and conditions regarding Code compliance and IR management are permitted without corporate approval

- All subcontractors and consultants are required to complete an on-site induction process that addresses project-specific IR obligations and Building Code compliance, such as right of entry, freedom of association, rights of the inspectorate and obligations to report.

Proactive engagement and management of supplementary labour hire

Labour hire contractors may be engaged to cover short-term requirements, such as absences due to leave, peak workloads, emergencies and unforeseen shortages.

Laing O'Rourke only considers engaging supplementary hire labour firms that are prequalified and fully satisfy the project's compliance requirements as detailed above. However, before a supplementary hire labour firm is engaged on the project, their compliance with the Building Code, NSW Implementation Guidelines, industrial instrument and statutory employment obligations will be confirmed.

All supplementary hire labour firms will be required to complete an on-site induction process that addresses project-specific IR obligations and Building Code and NSW Implementation Guidelines compliance, such as right of entry, freedom of association, rights of the FWBC and the CCU and obligations to report.

Managing subcontractor noncompliance

Laing O'Rourke will adopt the following process to manage claims of subcontractor noncompliance with employment obligations:

1. Noncompliance is alleged.
2. Laing O'Rourke consults the party raising the allegation to determine the nature of alleged noncompliance and to ascertain whether the alleged noncompliance is minor or major.
3. Where the alleged noncompliance is of a minor nature, Laing O'Rourke contacts the subcontractor representative and requests that the allegation be investigated and a response provided, and the alleged noncompliance be rectified where applicable.
4. Where the noncompliance is of a major nature, Laing O'Rourke reviews compliance records to verify information received from the subcontractor and progress payment status.
5. Laing O'Rourke meets with the subcontractor representative to discuss the allegations and audit compliance records.
6. Laing O'Rourke consults the subcontractor to determine the validity of the allegations and, where they are substantiated, assess liability and develop actions to rectify the noncompliance within an appropriate timeframe.
7. Laing O'Rourke ensures any noncompliance that has been discovered is rectified. This may include referring the matter to an appropriate tribunal based on the circumstances.
8. Laing O'Rourke consults the concerned parties to confirm that the noncompliance claim has been sufficiently resolved.

Where Laing O'Rourke identifies a risk of noncompliance, we will regularly audit the subcontractor to verify written statements and monitor the risk.

Laing O'Rourke will make it a contractual requirement with its subcontractors to ensure all grievances, disputes and industrial action are reported to us and that the contractor will take requisite steps to stop any unlawful industrial action. Laing O'Rourke will also ensure that any

damages or penalties are appropriately pursued. Subcontractors will also be advised of Laing O'Rourke's zero tolerance approach to unlawful industrial action.

Subcontractor productivity measurement matrix

As part of Laing O'Rourke Core and Enabling Processes, we will operate a dashboard of key performance indicators (KPIs) and productivity data. The dashboard will monitor the expected and realised performance of key trades, including those that are subcontracted.

The detailed monitoring regime used in the dashboard will be developed upon appointment. The contents will be broken down by subcontractor and trade group and summarised in accordance with the blank sample table below.

Trade	Target programme (man days)	Actual progress (man days)	Variation (+/-) programme (man days)	Comments
Package 1				
Package 2				

Table 6: Proposed model labour productivity measurement matrix

The data for all subcontract trades will be presented in table format, for ready access by the project team.

Commercial terms and productivity

Contractual obligations will be as prescribed in Laing O'Rourke's standard forms of contract for this project.

Part E: Conditions of employment

The purpose of this section is to outline how the tenderer will establish terms and conditions of employment for its direct labour.

The WRMP should include reference to the use of common law contracts, in the form of offer letters, conditions of employment and the like to reinforce the employer's expectations in relation to matters that relate to the Guidelines, including freedom of association, grievance management and unlawful industrial action.

Laing O'Rourke will employ its direct labour via common law contracts of employment.

Sample copies of Laing O'Rourke's templates for salaried and wages staff contracts of employment are provided in Appendix 2.

Part F: Recruitment of direct labour

The purpose of this section is to outline how the tenderer will attract, recruit and retain suitable direct labour. Depending on the size, scope and location of the Project, the tenderer may need to address issues of skills shortages, interstate and off shore sourcing of labour, training and competency assurance.

The WRMP should include details of how prospective employees are to be assessed and reference checked to ensure that they are of a standard that will meet the Guidelines' labour productivity expectations.

Attract, recruit and retain labour

Laing O'Rourke appreciates the importance of recruitment and retention of suitably skilled and competent people for the Building Renewal Projects. We also understand that effective direct labour management starts with recruitment. Laing O'Rourke has a thorough reference-checking process and system, and the primary determinant of a hiring decision is the candidate's cultural fit and aligned values. At Laing O'Rourke, the probationary review process is treated seriously

and the decision to take an employee off a probationary period has greater weight than the initial hiring decision. If new employees do not align with Laing O'Rourke values, they do not pass probation.

Laing O'Rourke intends to mobilise the project with a core team of long-term employees in order to set a productive tempo from the outset. Skill shortages are not expected to affect this project.

We will ensure that all subcontractors and labour hire companies are able to meet the requirements outlined in this WRMP prior to mobilisation to the project.

Registration of Interest

Laing O'Rourke will ensure all prospective candidates under consideration for employment on the project have completed a registration of interest (ROI) form accompanied by copies of trade papers, certificates of competency and licences where appropriate. We will also ensure that all subcontractors' employees have completed an ROI accompanied by copies of trade papers, certificates of competency and licenses where appropriate. These certifications will be randomly audited by Laing O'Rourke to check for authenticity.

Reference checks

Laing O'Rourke will ensure that reference checks and interviews are conducted for all prospective candidates for employment by either Laing O'Rourke or its subcontractors, in accordance with the Laing O'Rourke project recruitment and mobilisation procedure. For new employees of either Laing O'Rourke or its subcontractors, at least three reference checks will be conducted to verify their employment history and determine the applicant's suitability for employment on the project. For existing employees, Laing O'Rourke may use information provided from previous reference checks at the time of engagement.

Offer of employment

An employment offer will not be made to any person until the following has been carried out:

- The relevant ROI has been completed
- Reference checks have been completed
- ROI information has been submitted to the Laing O'Rourke Human Capital system
- Pre-employment medical has been completed and criteria met
- All other elements of Laing O'Rourke's project recruitment and mobilisation procedure have been complied with.

Part G: Induction and mobilisation

The purpose of this section is to outline how the tenderer will ensure that direct and subcontract employees can be mobilised to the site efficiently and effectively, and with a full awareness and understanding of the Project, and the expectations of the New South Wales Government in terms of safety, productivity and continuity of operations.

Laing O'Rourke has developed a structured on-boarding process that provides a practical but comprehensive induction for all our employees and subcontractors to ensure they understand the Laing O'Rourke way. This includes a detailed online induction, which must be completed prior to new employees commencing at Laing O'Rourke, and an orientation session for all new starters on their first day.

Employees to be mobilised to the project will be required to report to the nominated location with proof of identity and their signed Offer and Acceptance of Employment Form. Laing O'Rourke will

then conduct a site-specific induction for all employees and subcontractors before they start work on site. The induction will include the following modules:

- Scope of works
- Site organisation
- Responsibilities
- The form of industrial instrument such as workplace agreement
- Safety regulations
- NSW Code of Practice and Guidelines for safety, productivity and continuity operations
- Environmental considerations
- Quality assurance
- ER dispute settlement procedures
- Community relations responsibilities
- Freedom of association.

Following induction, employees will be issued with a project access and identity card, which will be valid for a specified period.

Further, before starting work on-site, all employees of Laing O'Rourke and all employees of any subcontractor must attend Laing O'Rourke's Next Gear behavioural safety training course to ensure they are fully briefed on the site requirements. All new employees will be provided with an explanation of the applicable safety rules, policies and procedures to be observed, including awareness of the community during construction at their induction.

In addition to the project induction, each subcontractor will be required to conduct their own area-specific induction that covers their own scope of works. As part of this process, the employees will be advised as to the applicable wages and conditions of employment.

Mobilisation

It is envisaged that the project will be resourced primarily using Laing O'Rourke locally engaged subcontract personnel. However, where the project employs non-local employees, Laing O'Rourke will have a detailed mobilisation and demobilisation procedure in place to manage the local community's requirements.

Part H: Labour productivity

The purpose of this section is to outline how the tenderer proposes to achieve the labour productivity and value for money objectives of the New South Wales Government. The WRMP should address how the tenderer proposes to measure labour productivity, identify barriers and opportunities to efficient and timely performance, and outline the key initiatives that will differentiate the Project.

The WRMP should demonstrate that the tenderer and all subcontractors have the ability to effectively identify and manage unsatisfactory employee performance, up to and including termination of employment.

Considerable labour productivity will be delivered by Laing O'Rourke on the SYAB project through the following initiatives:

Description	Action
Ensuring the project is resourced with the appropriate level of technical expertise, experience and	<ul style="list-style-type: none"> • Laing O'Rourke's thorough recruitment processes and procedures will be applied. • Senior managers with a track record of delivery and productivity increases will work on the project. • The project will be supported an experienced ER and IR Manager who can drive

20.1

Description	Action
dedication	<p>productivity and break down demarcations issues.</p> <ul style="list-style-type: none"> The project will be mobilised with a core Laing O'Rourke crew of long-term employees.
Establishing clear and defined reporting and decision making processes in relation to ER and IR issues	<ul style="list-style-type: none"> Laing O'Rourke's approach is that supervisors are responsible for their work groups and people and as a result can manage employee grievances and complaints. The Project Manager on-site will resolve approximately 90% of all industrial issues as they arise. There is a clear escalation process for ER/IR issues: <ol style="list-style-type: none"> Issues raised with Construction Manager Issue escalated to Project Manager Issue escalated to Project Director Issue escalated to General Manager Issue raised to Regional ER/IR Manager Issue raised to Head of ER/IR.
Delivering education and training	<ul style="list-style-type: none"> Laing O'Rourke is committed to the development of its people and is constantly looking to provide opportunities that support the growth of talented people. We have an extensive range of career toolkits to help employees search out opportunities and navigate the next steps of their career within the business. Laing O'Rourke also uses the Employee and Industrial Relations Training and Guidance Handbook, which provides Laing O'Rourke's project-based employees and managers with an overview and guidance on the legal requirements regarding Code and Guidelines compliance, right of entry and industrial action at workplaces within the building and construction industry. The handbook provides a high-level overview of Laing O'Rourke's obligations in the key topic areas of: Why Does Code Compliance Matter? Who Does the Code Apply to? What work is covered by the Code and Guidelines? Compliance Obligations – Employment law and other relevant statutes such as industrial instruments and the Code and Guidelines Tender and Contract Documentation Requirement – Third Party Involvement in Code Compliance.
Ensuring employees have the right qualifications	<ul style="list-style-type: none"> Laing O'Rourke has established foundation competencies to ensure all people working in prescribed activities on site are qualified and competent to carry out their particular duties and tasks. A training matrix has been developed that addresses the legislative, compliance and regulatory requirements of our projects, including the additional foundation competencies required by Laing O'Rourke for specific roles. Laing O'Rourke's central learning and Human Capital system is used to define, allocate and record training across its global operations.
Ensuring site's environmental standards preventing lost time and workplace disharmony.	<ul style="list-style-type: none"> A full environmental management plan will be implemented on the project post award.
Following Laing O'Rourke's Next Gear safety agenda	<ul style="list-style-type: none"> Next Gear is our agenda that builds safety resilience into the organisation, founded on engagement and trust. We place people at the heart of safety decision making, where safety performance focusses on understanding success and the many things that go right. As a business, we recognise that statistics are not necessarily an indicator of safety success. This doesn't mean we lose focus on preventing incidents, but we look beyond the failures to also identify the positives. We achieve this by placing empowered people at the centre of decision making and in doing so ensure transparency and accountability for safety. Next Gear challenges us to move beyond traditional safety practices and measures, by

Description	Action
	<p>applying a framework described in the three principles:</p> <ol style="list-style-type: none"> 1. People are the solution 2. Safety is the presence of positives 3. Safety is an ethical responsibility and not a bureaucratic responsibility. <ul style="list-style-type: none"> • At the heart of our approach is the belief that safety critical messages should be delivered by the business for the business. To this end our campaigns and engagement programs are delivered by operational leaders, staff and workforce. Laing O'Rourke requires all employees of independent contractors to undertake its full Next Gear induction and safety training. This ensures that safety is the first priority of every person who comes onto the project. <p>This is how we believe everyone will return home safely every day.</p>
Consciously restating the supervisor's role	<ul style="list-style-type: none"> • Laing O'Rourke appreciates that the success of an ongoing and productive employee relationship is determined largely by the capability of supervision. Laing O'Rourke has recently restated the importance of the supervisor's role and competencies and is delivering the required training. • On the Building Renewals Project, the supervisor will be given managerial responsibility for his or her people and held accountable for their performance and their safety. Supervisors will be empowered and enabled to make the final hiring decision, determine probationary review outcomes, discipline employees (up to and including termination of employment) and be involved in promotion and redeployment decisions. This will ensure that grievances are resolved by supervisors and that supervisors drive productivity.
Ensuring adherence to the safety management issue resolution process	<ul style="list-style-type: none"> • Laing O'Rourke will ensure that its safety issue dispute resolution process is followed in relation to all safety issues. This process clearly sets out the steps to be followed and ensures that, if one part of the project is deemed unsafe, employees are put to work on alternative and safe parts of the project.
Managing inclement weather and heat	<ul style="list-style-type: none"> • Following consultation with site management and the site Safety Representatives, the employees will start and continue to work during periods of inclement weather providing the work areas remain in a state that meet the requirements of the relevant site's Work Health and Safety Management Plan. In situations where inclement weather prevents safe work from being performed on site, Laing O'Rourke will, where practical, transfer employees to an alternative site not so affected, or to the company's depot to perform maintenance, service-type duties or training.
Managing rostered days off	<ul style="list-style-type: none"> • Subject to local government restrictions and the subcontractor's industrial instrument, the site will be open for productive work on ordinary working days. As required in consultation with the relevant employees and their employee representative, every endeavour will be made to roster days off adjacent to public holiday long weekends.
Managing relationships and communications	<ul style="list-style-type: none"> • A key ingredient for a productive and harmonious site is genuine two-way communication between management and the workforce. We will develop and maintain constructive relationships with employees, unions and other contractors, subcontractors and other institutions on all relevant issues that may directly or indirectly affect Laing O'Rourke's operations and/or the project. • The team will communicate through toolbox talks, newsletters, project meetings, WHS debriefs, pre-start talks and training sessions, as well as subcontractor meetings.

Table 7: Labour productivity issues

Laing O'Rourke will use the system of metrics detailed in Part I: Performance metrics to measure labour productivity. Labour productivity will be measured in the key trades listed below (to be completed following contract award). Laing O'Rourke will conduct labour productivity studies across these trades to ensure that productivity targets are met and to act upon instances where productivity does not meet expectations.

20.1

Sydney Metro City and Southwest Sydney Yard Access Bridge
Attachment 20.1: Workplace Relations Management Plan

Work group	Works package	Target programme (man days)	Actual progress (man days)	Variation (+/-) programme (man days)	Comments
Package 1					
Package 2					

Table 8: Proposed direct labour productivity measurement matrix

Initiatives to encourage performance and productivity

Laing O'Rourke operates a range of initiatives that will differentiate the project and drive labour productivity. These include: project barbecues, SafeSpine training, one-team uniforms, team events and family fun days.

Constructive competition between teams and individuals is promoted through displaying productivity performance of key trades in a public space on the project site, usually within the amenities compound. As with subcontractor performance rewards, meal vouchers are provided to strongly performing labour teams and individuals.

Employee performance management

Performance counselling, disciplinary procedures and policies will be implemented on the project. They will provide a procedurally fair and reasonable counselling and disciplinary process to manage employee behaviour. All employees will be made aware of the standards required on-site.

Subcontractors will be required to adopt a similar procedure to align their systems of performance evaluation and management with that of Laing O'Rourke.

Termination procedure

If an employee's work performance or behaviour is unsatisfactory, and after Laing O'Rourke has been through the performance management procedure, the next stage will be termination. An employee may also be summarily dismissed for serious misconduct or a serious breach to their employment contract.

No employee will be terminated without the approval of the Laing O'Rourke Project Manager. This includes summary dismissals. The applicable legislation and agreement will identify the mechanisms and procedures to manage an employee's termination. In the event that a decision has been made to terminate an employee of either Laing O'Rourke or a subcontractor, Laing O'Rourke will advise the client prior to the termination.

Counselling and disciplinary procedure

This applies to employees following the conclusion of their probationary period. The procedure will apply in all cases where formal counselling and disciplinary action is necessary. In the event that an employee fails to maintain satisfactory performance levels, the following counselling procedure will be applied:

- **Step1: Verbal warning/counselling:** An explanation of the concerns about the employee, together with company expectations, will be clearly outlined to the employee. The employee

will be given the right to reply. The employee will be then made aware of the standards of improvement required. This will constitute the first warning, which is to be documented.

- **Step 2: Written warning/improved performance:** If the employee fails to meet the standards of improvement in accordance with Step 1, a written warning will be given referring to the first warning. The written warning will state that it is a final warning and that failure to meet the standards of improvement stated therein will lead to dismissal without further notice.
- **Step 3: Dismissal:** Where the company has followed Steps 1 and 2 and the employee has failed to meet the standards of improvement, notice of termination may be given by the company. Depending on the circumstances, a warning will only remain active for a period of 12 months from the date the written warning was issued.

When an employee is terminated from the business, the employee will finish work immediately and will be paid for the remainder of that day. The employee will also be issued with a "Statement of Engagement" letter and paid out all leave accruals.

At any time during the counselling and disciplinary process, the employee will have full access to the OPTUM employee assistance programme (www.livewell.optum.com or 1300 361 008). This confidential external service provides counselling and support to employees to discuss any work or personal issues that are an inevitable part of life.

Part I: Performance metrics

The purpose of this section is to outline how the tenderer will measure and report labour productivity and performance. The WRMP should identify those key performance indicators which are relevant to the labour productivity initiatives identified as part of the WRMP, and indicate how they will be collected and reported.

In addition, the WRMP should provide for data as to overall site and labour efficiency, lost time and continuity of operations, delays and disruptions due to industrial matters, including grievances, right of entry and the activities of shop stewards.

The WRMP should specify who is responsible for collating the performance metrics, and who is responsible for their review and for ensuring that unsatisfactory performance is acted upon.

As part of Laing O'Rourke's Core and Enabling Processes, project performance is measured and labour productivity reported using a suite of tools and dashboards that encompass lean construction principles. This suite identifies the KPIs. Samples of this suite are provided in the series of images below.

Person responsible: Project Information Manager, Project Manager and Regional ER/IR Manager

Laing O'Rourke has in place a right of entry register that captures all right of entry (both lawful and unlawful), as well as a lost-time register that captures all lost time associated with a union (both lawful and unlawful – including safety stoppages) as well as the cost of that lost time to the project. These registers will be completed and updated by the Regional ER/IR Manager, with ultimate responsibility lying with the Project Manager. The data from the register will then be included in an ER report for the Board, which also allows for targeted training and development as required to ensure appropriate responses are taken.

Three-week look-ahead programme

The three-week look-ahead programme will be prepared by the engineer in charge of a section of works to align with the mid-range delivery programme and overall construction programme. A sample three-week look-ahead programme, in which we are using a lean construction technique known as the "Last Planner", is provided below. These programmes will be reviewed collectively among the team to ensure all activities are coordinated. Strong performance will be recognised and made public in front of the team.

20.1

Sydney Metro City and Southwest Sydney Yard Access Bridge Attachment 20.1: Workplace Relations Management Plan

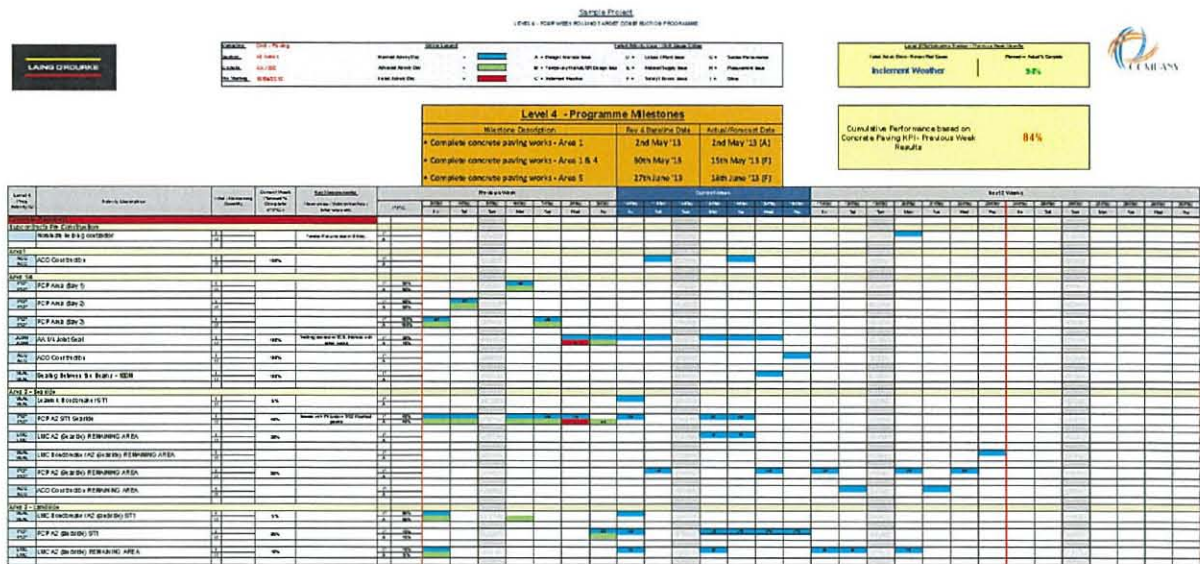


Figure 2: Three-week look-ahead programme

Three-week look-ahead dashboard


The output of the three-week look-ahead programmes developed for each trade will be summarised on a dashboard and circulated among the project team. The following image includes a sample dashboard report. The dashboard can be tailored to provide details of the non-completion of work, for example weather delays, delays due to industrial matters or shop steward activity. The project team will undertake root cause analysis to act on issues as they arise.




Figure 3: Sample dashboard

Milestone tracker

The milestone tracker presented below is the simple standard format adopted across Laing O'Rourke for presenting to the team the current status of target milestones.



Sample Project
Programme - Milestone Tracker
Progress to 10 May 2013



Activity ID	Activity Description	Planned Start	Planned Finish	F'cast / Actual Start	F'cast / Actual Finish	This Week +/-	Last Week +/-	Weekly Variance +/-	Notes Ref
Earthworks Team									
A07-1010	Complete Earthworks to Area 7		19-Feb-13		25-Jan-13	25	25	0	
A03-1010	Complete Earthworks to Area 3		31-Jan-13		31-Jan-13	0	0	0	
A10-1040	Complete Earthworks to Area 10		14-Feb-13		9-Feb-13	5	5	0	
A01-1750	Complete All Earthworks to Underside of Paving Area 1 (incl Sealing)		15-Feb-13		15-Feb-13	0	-2	2	
A02-1060	Complete All Earthworks to Underside of Paving Area 2		27-Mar-13		26-Mar-13	-1	0	-1	1
A04-1090	Complete All Earthworks to Underside of Paving Area 5		26-Mar-13		30-Mar-13	-4	-3	-1	2
A01-1120	Complete All Earthworks to Area 1 & 4 (incl Sealing)		23-Apr-13		23-Apr-13	0	0	0	
Drainage Team									
A02-1190	Complete Pit & Pipe Installation to Area 2		1-Feb-13		7-Feb-13	-6	-5	-1	
A05-1230	Complete Pit & Pipe Installation to Area 5		15-Feb-13		19-Feb-13	-4	-6	2	
A03-1210	Complete Pit & Pipe Installation to Area 3		9-Mar-13		9-Mar-13	0	0	0	
A01-1330	Complete Pit & Pipe Installation to Area 1 & 4		6-Apr-13		8-Apr-13	-2	0	-2	3
A10-1030	Complete SQUID Installation to Area 10		8-Mar-13		14-Mar-13	-6	-6	0	
A10-1090	Complete Pit & Pipe Installation to Area 10		15-Apr-13		15-Apr-13	0	0	0	

Figure 4: Milestone tracker

KPI graphs

KPIs presenting planned versus actual progress of key activities across the project will be produced. These will be included on the project dashboard and displayed prominently in the project amenities block. A sample is provided below.

20.1

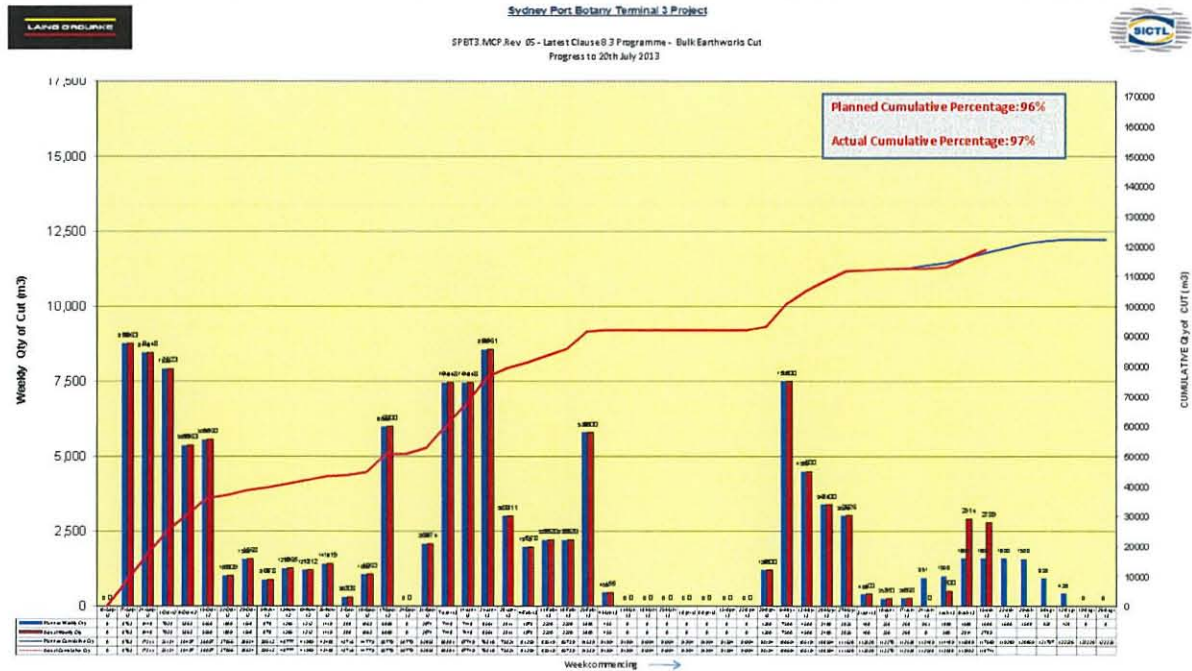
Sydney Metro City and Southwest Sydney Yard Access Bridge
Attachment 20.1: Workplace Relations Management Plan

Figure 5: KPI graph

Part J: Freedom of association

The purpose of this section is to outline how the tenderer will comply with the Freedom of Association objectives of the Guidelines.

Appendix 1 contains a summary of the Sole objectives and prohibitions provided for by the Guidelines. The WRMP should outline how the tenderer proposes to meet the Guidelines' FoA objectives in a holistic and integrated manner. This might include reinforcing the principles and prohibitions in recruitment and induction processes and documents; reinforcement of employees' obligations in employment documents; ongoing education and training; and an inspection and audit programme.

Laing O'Rourke's Core Process ensures that all employees and subcontractors are aware of their responsibilities regarding freedom of association. This is achieved through:

- **Invitation to Tender Questionnaire:** This requires subcontractors to answer a detailed set of questions in relation to freedom of association
- **Pre-award tender compliance:** Subcontractors' responses to the Invitation to Tender Questionnaires are audited and reviewed by Laing O'Rourke to identify any areas of concern or possible noncompliance prior to award of the contract
- **Contract compliance:** All subcontract works packages in delivery contain strict terms and conditions for Code compliance based on the Model Tender and Contract Documentation May 2013. All new subcontracts will contain terms and conditions for Code compliance based on the Model Tender and Contract Documentation and for the Building Code 2013 and the Implementation Guidelines for the New South Wales Code of Practice for Procurement: Building and Construction – 1 July 2013
- **Site communications:** All employees and subcontractors must attend the Laing O'Rourke site induction before commencing works on a specific project. The induction sets out the principles of the Building Code 2013 and NSW Guidelines, freedom of association, union right of entry and unlawful industrial action. Project sites are monitored for any material placed on or around the site that infringes freedom of association. Other site communications include

direct communications conveyed by notices and fact sheets, as well as team briefings and toolbox talks

- **Structured training:** Laing O'Rourke employees must attend "must know" training and development programmes outlining Code compliance obligations generally as well as structured training modules for key topics such as Building Code and NSW Guidelines, freedom of association, union right of entry and unlawful industrial action.

Laing O'Rourke has an established freedom of association policy and on-site procedures to ensure compliance to the Guidelines summary of freedom of association objectives and prohibitions. Our strategy to reinforce the freedom of association principles and prohibitions will be managed through:

- The recruitment and induction process
- Letters of appointment, stipulating employees' obligations
- Subcontractors' invitations to tender and awarded contract conditions
- A site management education training programme to ensure there is a thorough knowledge and understanding of their obligations under the freedom of association objectives and prohibitions.

Part K: Right of entry

The purpose of this section is to outline how the tenderer will comply with the right of entry requirements of the Guidelines.

The WRMP should include an assessment of site security and access and a requirement that relevant staff are familiar with the ROE requirements and procedures provided for under the Fair Work Act 2009 and the Work Health and Safety Act 2011 (NSW), including ensuring that union officials hold valid permits. The WRMP should include how the tenderer will ensure that ROE standards are maintained and enforced by subcontractors. The WRMP should also demonstrate how the tenderer will monitor union officials' activities and interest in the project/site, and what steps are to be taken where officials breach or otherwise misuse their right of entry.

Right of entry can be a major source of disruption and distraction for management as well as a major barrier to labour productivity. Laing O'Rourke's proposed site management team for the Building Renewals Project have received (and will continue to receive) training and development to ensure they have a thorough understanding of the right of entry system and can properly respond to legitimate and illegitimate behaviours. Where there is deviation from the proper standard, or the right of entry is being abused, Laing O'Rourke will take immediate action against the relevant official and the union. Further, Laing O'Rourke's Core Process ensures that employees and subcontractors are aware of their responsibilities with regard to right of entry. This is achieved through:

- **Invitation to Tender Questionnaire:** This requires subcontractors to answer a detailed set of questions in relation to implementing practices and procedures for right of entry
- **Pre-award tender compliance:** Subcontractors' responses to the Invitation to Tender Questionnaire are audited and reviewed by Laing O'Rourke to identify any areas of concern or possible noncompliance prior to award of the contract
- **Contract compliance:** All subcontract works packages in delivery contain strict terms and conditions for Code compliance based on the Model Tender and Contract Documentation (under the applicable Guidelines). All new subcontracts will contain terms and conditions for Code compliance based on the Model Tender and Contract Documentation. All new subcontracts will also contain an express acknowledgment to comply with Laing O'Rourke right of entry requirements

- **Site communications:** All employees and subcontractors must attend the Laing O'Rourke site induction before commencing works on a specific project. The induction sets out the rules for right of entry and the appropriate site contact responsible for managing right of entry. Other site communications include direct communications conveyed by notices and fact sheets, as well as team briefings and toolbox talks
- **Internal reporting forms:** Core Process requires employees to report, using a dedicated form, right of entry breaches. The information is collated and monitored by the ER management team
- **Structured training:** Laing O'Rourke employees must attend "must know" training and development programmes outlining Code compliance obligations generally as well as structured training modules for key topics such as right of entry.

Training in right of entry

The right of any accredited union officials to enter and have discussions with eligible members of their union on the project site will be subject to the general entry and security regulations of Laing O'Rourke and project-specific entry conditions. Laing O'Rourke will comply with the *Fair Work Act 2009* and the *Work Health and Safety Act 2011* when dealing with union right of entry.

Laing O'Rourke will comply with the site procedure for managing the right of entry requests from union officials and will ensure our field staff have been educated and trained so they are fully aware of the right of entry conditions, procedures, and reporting protocols and systems applicable to the site.

All managers and supervisors at Laing O'Rourke undertake training and development in relation to right of entry.

Site security and access

To minimise access points onto the project, access will be controlled by security and there will be no entry onto site without authorisation by Laing O'Rourke.

How right of entry will be managed by subcontractors

In the event a union official approaches Laing O'Rourke, or one of our subcontractors, to gain access to the site, the Project Manager will immediately advise the client. While on site, the union official will be accompanied by Laing O'Rourke site management without any hindrance to conduct the legitimate business for which they were issued site access.

For union organiser visits, the Project Manager will ensure appropriate management for the duration of the visit. If there is concern about managing this process at a project level, our Regional ER/IR Manager and external advisers will be involved.

Laing O'Rourke will manage and report to the client on union right of entry in accordance with our right of entry procedure.

Action taken for breach of right of entry

Laing O'Rourke has a track record of taking quick and effective action against unions and union officials who breach right of entry requirements. This has been demonstrated by applications to Fair Work Australia in relation to what Laing O'Rourke alleges is inappropriate conduct on some of our sites in NSW. Further, breaches of right of entry by union officials were part of an ongoing Federal Court proceedings commenced by Laing O'Rourke against the CFMEU and Builders Labourers Federation (BLF) in Queensland.

Union delegates

Union delegates will have a range of rights, depending on the terms of the industrial agreement. Non-working delegates are not allowed on Laing O'Rourke sites. Delegates are treated as employees first and delegates second. The stepped processes in grievance resolution procedures are rigorously adhered to and management does not tolerate departures from those procedures.

Part L: Grievance management

The purpose of this section is to outline how the tenderer will ensure that employee grievances are managed effectively and in accordance with the relevant industrial instrument and the Guidelines.

The WRMP should include mechanisms for monitoring and recording the nature and frequency of grievances amongst the direct workforce and the subcontract workforce. The WRMP should ensure that the Guidelines' requirement that the employee is free to choose whether and by whom to be represented in a grievance process is monitored and enforced (unless there is a requirement to the contrary in the relevant enterprise agreement).

In order to comply with the Code and the Fair Work Act (as amended), Laing O'Rourke and any subcontractors are required to have in place industrial agreements that have been assessed by the Department of Employment as being "Code Compliant" for enterprise agreements entered into or varied prior to the 18 May 2016 and the FWBC for enterprise agreements entered into or varied from the 18 May 2016 onwards, as well as an appropriate and lawful grievance and industrial dispute settlement procedure. Further, Laing O'Rourke applies the following principles when resolving grievances:

- The employee or employees concerned will raise the matter with the appropriate supervisor for resolution
- If not resolved, the employee or employees will raise the matter with more senior levels of management as appropriate
- While the dispute settlement procedure is being conducted, work will continue normally unless an employee has a genuine and reasonable concern about an imminent risk to their health and safety
- All workplace relations or WHS matters affecting the site, project costs, related contracts and timelines will be reported within 24 hours to the client and CCU. Additionally, as required, such matters will be reported to the FWBC.

Monitoring grievances

All employee grievances will be recorded in a project issue register, which is maintained on site. All managers and supervisors receive training to ensure they understand the dispute and grievance processes and can manage all disciplinary action on site in accordance with the industrial instrument.

Part M: Management of unlawful industrial action

The purpose of this section is to outline how the tenderer will ensure that the project is set up and resourced to properly monitor, respond to and report unlawful industrial action, including ensuring that the costs associated with unlawful action can be recovered.

The WRMP should consider the issues raised at Appendix 3 in completing this section.

The WRMP should ensure that the prohibition against the payment of strike pay is complied with and that such compliance can be verified in respect of its own employees and in respect of subcontractors' employees. This may include ensuring that the tenderer can audit the payroll systems and associated records of the subcontractor.

A zero tolerance approach to breaches of the law

There are a number of actions that Laing O'Rourke can take when faced with breaches of the industrial agreement, unlawful action or breaches of the Fair Work Act. Over the past 24 months,

Laing O'Rourke has gone to considerable lengths, including commencing proceedings in the Federal Court, to make it clear that it will not tolerance such breaches and that it has a zero tolerance approach to unlawful conduct. This included seeking damages against relevant unions exceeding \$10m.

This zero tolerance approach is supported by:

- Laing O'Rourke's IR management systems and reporting protocols that strictly meet the Guidelines requirements of Appendix 3: Management of unlawful industrial action and enable Laing O'Rourke to report any threatened or actual industrial action within 24 hours
- Training and development that has been (and will continue to be) rolled out to site management and supervision to ensure they are capable of recognising unlawful behaviour and that Laing O'Rourke can initiate appropriate action against the individuals and organisations concerned.

Monitoring

Laing O'Rourke is constantly monitoring actual or threatened industrial action. The project team will be required to report any potential IR issues into the Regional ER Manager as soon as they arise. Further, Laing O'Rourke's Industrial Relations Policy obligates the company to advise a relevant client in accordance with the contract of any potential or actual industrial dispute and work with the client to implement initiatives and responses to these disputes. The policy and procedure have been revised to meet the New South Wales Implementation Guidelines and Building Code's requirement to report actual or threatened industrial action as soon as practicable after the action or the occurs. Further, Laing O'Rourke's Core Process, via the suite of standard subcontract forms, includes express obligations for subcontractors to:

- Take all steps and measures to avoid and to minimise the consequences of industrial disputes, including ensuring that its personnel are conversant with and adhere to the dispute settlement procedures contained in any applicable industrial instrument
- Advise Laing O'Rourke of any demarcation problem or dispute that arises or is likely to arise among its employees or between its employees and the employees of others, including those of the Laing O'Rourke
- Take steps to initiate legal proceedings following unlawful action
- As soon as practicable, and no later than 24 hours, inform Laing O'Rourke of any actual or threatened industrial action, or demands made by its workforce or any representative of its workforce affecting the works or the project that could lead to industrial action.
- Comply with any reasonable direction issued by Laing O'Rourke with the objectives of reducing industrial dispute.

Laing O'Rourke's site management IR education and training programme provides supervisors with the skills to properly record the details of the facts, financial costs and circumstances surrounding the action in a format satisfactory for affidavits and witness statements. Further, managers have received training so that they understand and can identify unlawful action.

Rallies and other protests

Where Laing O'Rourke becomes aware of a state rally day or other protest, the following action is taken to ensure that its employees continue to work:

- Employees are addressed at the prestart meetings and advised that they are required to attend work

- All employees are provided with a written direction to attend work
- Employees are advised that they will be deducted four hours pay and also receive a formal warning for a failure to attend work.

Legal assistance and options

Laing O'Rourke has engaged Mills Oakley as its lawyers. This law firm has significant experience in managing litigation against unions and can advise Laing O'Rourke on the full range of legal options. Laing O'Rourke also understands its obligation to seek approval from the CCU to settle any proceedings commenced.

For example, Laing O'Rourke has gained injunctions against the CFMEU, BLF and CEPU in Queensland to prevent ongoing industrial action. Laing O'Rourke is acutely aware of the legal remedies available to it to prevent ongoing industrial action.

Part N: Audit and Review

The purpose of this section is to outline how the tenderer will audit and review the WRMP.

The WRMP should be reviewed regularly over the life of the project, and modified wherever there is scope for improved performance.

Laing O'Rourke has audit obligations enshrined in head contract terms and conditions in relation to Code compliance, and these obligations are passed through the supply chain via the contracts for subcontractors and consultants. Using these contractual mechanisms, random audits will be carried out on the SYAB project so that subcontractors and consultants are assessed for Code compliance. Key elements to the audit process include:

- Review of Invitation to Tender responses received from subcontractors, including answers to detailed questions, review of industrial instruments and breakdown of scope of works
- Enforcement of standard terms and conditions reflecting the Model Tender and Contract Documentation in contracts
- Minimum standards for on-site induction materials.

In response to audits and reviews, Laing O'Rourke undertakes continual modification and updating of Core and Enabling Process documents and implementation and communication programmes.

Laing O'Rourke will make available on request all of its records and facilitate the production of those records related to subcontractors or suppliers to determine and assess their compliance with requirements of their lawful industrial instruments, the relevant employment statutes and the contract.

In addition to setting out scope of work requirements, the Invitation to Tender is specifically designed to allow Laing O'Rourke to assess a subcontractor's compliance with:

- The Implementation Guidelines to the New South Wales Code of Practice for Procurement: Building and Construction
- Employment obligations and history under the Fair Work Act
- Industrial instruments
- Fair Work principles
- WHS requirements and legislation
- Contractual obligations as prescribed in Laing O'Rourke's standard forms of contract.

20.1

The implementation of this WRMP will be followed by ongoing reviews and audits by the Regional ER/IR Manager or his/her delegate and an external auditor to monitor compliance. Laing O'Rourke acknowledges that the client, the CCU and the FWBC may conduct periodic audits of this WRMP and will make available all records, personnel and assistance (as is required) to enable the fulfilment of such audits.

Laing O'Rourke acknowledges the importance of the project implementation reviews and will willingly participate in reviews scheduled to take place during the course of the project.

Appendix 1: Summary of freedom of association objectives and prohibitions

Item	Prohibition/requirement	Guideline reference
General prohibition	A party must not enter into, participate in, or facilitate arrangements or practices designed to avoid its own legal obligations, or the legal obligations of others. This includes arrangements or practices that undermine freedom of association.	4.2
Policies	Contractors must adopt policies that promote freedom of association.	10.1
Personal information	Contractors may not provide the names of new staff, job applicants, contractors or subcontractors to unions other than as required by law (or relevant enterprise agreement).	10.2 dot point 1
Union membership	Contractors may not permit 'no ticket, no start' signage; 'show card' days; or any other practice which implies that union membership is anything other than a matter for individual choice, including employers unlawfully encouraging or discouraging employees to join a union.	10.2 dot point 2, 3
Inductions	Contractors must not allow employee representatives, shop stewards or other union officers to undertake or administer site induction processes (unless there is a requirement to do so in the relevant enterprise agreement). Site management must oversee or be involved in these processes.	10.2 dot point 4
Discrimination	Contractors must not discriminate against or disadvantage elected representatives.	10.2 dot point 5
Forms	Contractors must not use any form which requires an employee to identify their union status, nor should they require that subcontractors identify the union status of their employees or subcontractors.	10.2 dot point 6
Refusal to employ or terminate	Contractors must not refuse to employ or terminate an employee because of their union status.	10.2 dot point 7
Refusal of request to represent	Contractors must not refuse a reasonable request from a workplace delegate to represent employees in relation to grievances and disputes or discussions.	10.2 dot point 8
Non-working shop steward	Contractors must not permit the imposition, or attempted imposition, of a requirement for any employer on site to engage a non-working shop steward or delegate or to hire an individual nominated by a union (unless there is a requirement to the contrary in the relevant enterprise agreement).	10.2 dot point 9
Logos and indicia	Contractors must not require the display of union or related logos, mottos or other indicia on company property or equipment, including clothing (unless there is a requirement to the contrary in the relevant enterprise agreement).	10.2 dot point 10

Table 9: Summary of freedom of association objectives and principles

Appendix 2: Contracts of employment

A sample page of Laing O'Rourke's templates for salaried and wages staff contracts of employment is provided on the following page.

Wages Staff Contract of Employment

<p style="text-align: center; margin: 0;">COMPLETE THINKING</p> <p style="text-align: center; margin: 0;">Laing O'Rourke Australia</p>	<p style="margin: 0;">LAING O'ROURKE</p>
<p>[insert date]</p> <p>[insert name] [insert address]</p> <p>PRIVATE AND CONFIDENTIAL</p> <p>Dear [insert name],</p> <p>Offer of Employment</p> <p>On behalf of Laing O'Rourke Australia Construction Pty Limited ("the Company") I have the pleasure in offering you employment on the following terms and conditions. If the terms and conditions are acceptable to you, please initial each page of the enclosed duplicate of this letter, sign the duplicate letter where indicated on the last page, and return the signed acceptance and related documents to the Company's office located at [insert] within five (5) working days of receipt of this offer.</p> <p>1. CLASSIFICATION AND ENGAGEMENT</p> <p>1.1 You are appointed by the Company as a [insert classification] under the [insert Enterprise Agreement] ("Enterprise Agreement"). The Enterprise Agreement applies to your employment but does not form part of your contract of employment.</p> <p>1.2 You will be employed [insert only 1 of the choices from below]</p> <p style="padding-left: 20px;">as a Full-time employee. OR</p> <p style="padding-left: 20px;">as a Part-time employee, in which case your usual working hours will be as discussed with you.</p> <p>1.3 You will be employed [insert only 1 of the choices from below]</p> <p style="padding-left: 20px;">for the specified task of performing the work of your classification on the project as identified in clause 0. Unless your employment is terminated earlier under clause 0, your employment will end when the specified task ends. OR</p> <p style="padding-left: 20px;">for the specified period until [insert date], unless terminated earlier under clause 0.</p> <p>1.4 You may be required to work shift work and to move between shift work and day work as directed; and to work overtime, weekends and public holidays so as to meet the operational requirements of the Company.</p> <p>2. PAY AND CONDITIONS</p> <p>2.1 Upon commencement of your employment your hourly rate of pay will be \$[insert amount from relevant classification in Enterprise Agreement].</p> <p>2.2 [insert the following two subclauses if project rates apply] However for the period ("the Period") that you are engaged on the [insert name of project] ("the Project") in [insert</p>	
<p>Level 4, Innovation Place, 100 Arthur Street, North Sydney, NSW 2060, Australia tel: +61 2 9903 0300 fax: +61 2 9903 0333 web: www.laingorourke.com.au 489 39 752 099 000</p>	

Salary Staff Contract of Employment

<p>COMPLETE THINKING Laing O'Rourke Australia</p>	<p>LAING O'ROURKE</p>
<p>Private and Confidential</p>	
<p>[insert date]</p>	
<p>[insert name and address details]</p>	
<p>Dear [first name]</p>	
<p>Thank you for considering joining Laing O'Rourke Australia. I am pleased to be able to confirm our offer of employment to you as [insert position title], and have attached our Contract of Employment for your consideration.</p>	
<p>The Contract of Employment sets out terms and conditions of this offer of employment. Please ensure you review this document as it will form the entire agreement between us. An additional copy of the Contract of Employment is enclosed for your retention.</p>	
<p>In our Employment Pack you will also find some important information on the Company, our Values, and the importance we place on our people. Please take the time to read these documents as I hope they will also give you the confidence that you are about to join one of the world's most dynamic, innovative, privately owned development, construction and specialist companies.</p>	
<p>You will have the opportunity to discuss our Company Values and business objectives in more detail during your induction.</p>	
<p>To accept our offer of employment, please return one signed copy of the Contract of Employment directly to [insert person] by [insert date]. If we do not receive your signed acceptance by this date the offer will automatically lapse. Please also complete the employment related forms in the accompanying Employment Pack and return to me for processing prior to, or upon, your commencement.</p>	
<p>This is a conditional offer subject to you meeting certain conditions based on your pre-employment checks:</p>	
<ul style="list-style-type: none"> a) providing satisfactory work references; b) a criminal records check; c) providing proof that you have the right to work in Australia; and d) a medical examination report from the company's medical advisor (if required). 	
<p>If in the opinion of the Company, any of the above conditions are not satisfactory, the Company has the right to withdraw this offer, or if your employment has already commenced, terminate your employment.</p>	
<p>Please do not hesitate to contact me if you wish to discuss any aspect of this offer further. I am delighted to have you joining our team and look forward to welcoming you.</p>	
<p>Yours sincerely</p>	
<p>[Name] [Position]</p>	
<p>Level 4, Innovation Place, 100 Arthur Street, North Sydney, NSW 2060, Australia tel: +61 2 9903 0300 fax: +61 2 9903 0333 web: www.laingorourke.com.au ABN: 39 112 029 000</p>	

Appendix 3: Management of unlawful industrial action

The Guidelines

The New South Wales Government wishes to encourage greater flexibility and productivity within the state's building and construction industry and ensure that the New South Wales Government maximises value for money on its spending on infrastructure projects. One of the major sources of inefficiency, delay and cost to the industry and to the state is unlawful industrial action.

The guidelines provide for the following requirements in relation to industrial action:

Item	Requirement	Guideline
Dispute settlement	Parties must ensure industrial action does not occur while dispute settlement procedures are being followed (unless the relevant industrial agreement requires otherwise).	8.3
Reasonable steps	Parties must take all reasonable steps to resolve industrial action which adversely affects, or has the potential to adversely affect, the delivery of a project or other related contracts on time and within budget.	8.9
Reporting	Contractors must report any threatened or actual industrial action to the CCU and the client within 24 hours that may impact the project, project costs, related contracts or timelines. The contractor must also provide regular updates to the CCU and the client in relation to the steps being taken to resolve the threatened or actual industrial action.	8.10
Legal Response	Contractors must take all steps reasonably available to them to prevent or end unprotected action occurring on or affecting the projects, including taking legal action.	8.11

Table 10: Industrial action requirements

In developing WRMPs, tenderers should consider the following:

What is unlawful action?

The WRMP should ensure that the concept of unlawful action is properly defined and that site management and subcontractor management understand what behaviours constitute unlawful action. For example, a stoppage in relation to an alleged safety issue that is not in accordance with the terms of the industrial instrument or the *Work Health and Safety Act 2011* is likely to constitute unlawful action.

How is the unlawful action to be recorded?

The WRMP should ensure that any unlawful action is properly recorded. This should include details as to who is involved, the issues underlying the action, the unions involved, and the proposed nature and duration of the action. In order to properly comply with the Guidelines requirements, tenderers will need to ensure that site management, particularly supervisors of direct and subcontract labour are able to properly record the details of the circumstances surrounding the action in a format that is satisfactory to include in affidavits and witness statements.

Where unlawful action is reported to the CCU, there will be a specific audit of the tenderer's compliance with this requirement.

How will the contractor respond to notification of a rally or other protest activity involving workers on site, including requests by workers to attend a rally?

The WRMP should outline how the tenderer proposes to ensure that rallies, protests and other activities that result in lost time are managed in accordance with the Guidelines. This includes

taking all reasonable steps to prevent or end the proposed action, to recover losses associated with the action, and ensuring that workers are not paid strike pay during a period of unlawful industrial action.

Is the contractor aware of the range of legal options available and properly resourced to apply those options?

The Guidelines require that contractors take all reasonably available steps to bring unlawful industrial action to an end. The WRMP should demonstrate that the contractor has an awareness of the range of options available to counter unlawful action, including all legislative and common law sources of action. The WRMP should also identify what resources are available to the tenderer and subcontractors to ensure that legal responses to unlawful action are prompt and effective.

Identification of losses and costs associated with unlawful industrial action

In order to claim interlocutory relief from unlawful action, tenderers must be able to promptly identify the costs arising from the action. The WRMP should outline who is responsible for the collection and collation of this information.

Authority to settle, withdraw or otherwise terminate legal proceedings

Where tenderers or subcontractors initiate legal proceedings following unlawful action, the contractor should discuss any proposed settlement or withdrawal of the proceedings with the CCU. This step should be reflected in the WRMP in order to ensure compliance with Part 6, sub-clause 1.8 (g) of the Model Tender and Contract Documentation issued July 2013.

Attachment 2 – Initial Work Health Safety Management Plan

Sydney Metro City and Southwest Sydney Yard Access Bridge Attachment 20.2: Work Health Safety Management Plan

Document and revision history

Document details	
Title	Work Health Safety Management Plan
Client	Transport for NSW
Client reference no.	2016/027
Laing O'Rourke contract no.	TBC

Revisions

Revision	Date	Description	Prepared by	Approved by
1	10 November 2016	Initial Issue for tender	John Sharpin	Raquel Rubalcaba

Management reviews

Review date	Details	Reviewed by

Controlled: YES Copy no.: Uncontrolled: NO

Note: This plan is a near-final draft and will be reviewed subject to the advice that Laing O'Rourke is the preferred tenderer.

20.2

Terms and definitions

The following terms, abbreviations and definitions are used in this plan.

Term	Definition
BAC	blood alcohol concentration
DBYD	Dial Before You Dig
FOPS	falling object protection system
FSR	Fatal and Severe Risk
HSE	health, safety and environmental
HVNL	Heavy Vehicle National Law
OEM	original equipment manufacturer
PPE	personal protective equipment
RIM	Rail Infrastructure Manager
ROPS	rolling object protection system
RSNL	Rail Safety National Law
SDS	safety data sheet
SMS	Safety Management System
SWMS	safe work method statement
SYAB	Sydney Yard Access Bridge
VOC	verification of competency
WHS	work health and safety
WHSMP	Work Health Safety Management Plan

Table 1: Terms and definitions

Table of contents

1. Introduction	5
1.1 Purpose.....	5
1.2 Scope of work	5
2. Roles and responsibilities	5
2.1 Organisational chart.....	6
3. Next Gear	6
4. Safety Management System compliance	7
5. Measurement and evaluation	7
5.1 Objectives and targets.....	7
5.2 Management review	8
5.3 Routine inspections	9
5.4 Health and safety leadership engagement	9
5.5 Fatal and Severe Risks review	9
5.6 Audits	9
5.7 Corrective actions	10
6. Hazard identification, risk assessment and control	10
6.1 Arrangements for controlling site risks and hazards	10
6.2 Project-specific risk	13
7. Permits to work	20
8. Change management	20
9. Emergency preparedness and response	21
9.1 Emergency procedures, evacuation and drills	21
9.2 Communicating emergency procedures	21
9.3 Emergency drills	21
9.4 Training and competencies of emergency personnel.....	21
9.5 Emergency management of dangerous goods and hazardous chemicals	21
10. Incident management	21
10.1 Incident notification and reporting.....	22
10.2 Assistance, rehabilitation and return to work programme.....	23
10.3 Director involvement protocol	23
10.4 Incident investigation	23
10.5 Communication and sharing lessons	24
10.6 Monthly statistical reporting	24
11. Whole-of-project consultation and engagement	24
11.1 Health and Safety Policy.....	24
11.2 Health and safety representatives	25
11.3 Health and Safety Committee	25
11.4 Pit Crew.....	25
11.5 Collective insights	25

20.2

11.6	Investigating for success	25
11.7	Pit stops	25
11.8	Toolbox talks	25
11.9	Daily activity briefings and pretask briefings	26
11.10	Contractor coordination meetings.....	26
11.11	Observation reporting	26
11.12	Other workplace-specific consultation methods.....	26
11.13	Consultation with others.....	26
12.	Selection and control of contractors and suppliers	27
13.	Project health and safety training.....	28
13.1	Sydney Metro Industry Curriculum	28
13.2	Inductions.....	28
14.	Fitness for work	29
14.1	Fatigue management.....	29
14.2	Alcohol and other drugs.....	29
15.	Legal obligations and record management	30
15.1	Relevant legislation.....	30
15.2	Access to health and safety information.....	30
15.3	Managing health and safety records	31
	Appendix 1: Organisational chart	32
	Appendix 2: Health and safety activity schedule	33
	Appendix 3: Project Risk Assessment	34
	Appendix 4: Plant and Equipment Register.....	34
	Appendix 5: Emergency Response Plan	35
	Appendix 6: Health and Safety Policy	37
	Appendix 7: Fatigue Management Plan	38
	Appendix 8: Register of applicable legislation.....	39
	Appendix 9: Training needs analysis	40

1. Introduction

This Work Health Safety Management Plan forms part of the suite of project management plans that will be developed for the Sydney Yard Access Bridge project. It describes the Laing O'Rourke management systems, procedures and controls that Laing O'Rourke will use to:

- Achieve all SYAB project WHS objectives
- Deliver the project in a safe productive manner
- Provide innovative solutions that align with the overall project objectives
- Achieve exceptional and demonstrable outcomes in safety.

The Work Health Safety Management Plan (WHSMP) is a dynamic document and will be updated throughout delivery of the project, as required.

1.1 Purpose

The WHSMP is a practical guide for operations on site and will be implemented to ensure project delivery is aligned with the project objectives. The plan demonstrates our commitment to maintaining business as usual for Sydney Trains during project delivery and how the works will be managed to achieve safe outcomes.

1.2 Scope of work

The SYAB project forms enabling works that support the broader Sydney Metro City and Southwest programme. It will enable ongoing access to the proposed Southern Services Building at the metro station and ongoing access to Sydney Yard by Sydney Trains for its maintenance activities.

The project involves the construction of a bridge over existing rail infrastructure, including rails, signals and overhead wiring (OHW). The bridge will rise from Regent Street, landing in the Sydney Yard maintenance area.

The project will comprise demolition work of existing residential housing, construction of the bridge proper, tie in to Regent Street and commissioning of the bridge. The scope also includes OHW for existing train services.

2. Roles and responsibilities

The key safety roles and responsibilities are outlined in Table 2.

Role	Responsibility
Project Director	<ul style="list-style-type: none"> • Oversee the project's implementation of our "Next Gear" safety strategy • Ensure project senior management fulfil their health and safety obligations • Provide reports and updates to the client's representative on safety results and initiatives
Project Manager	<ul style="list-style-type: none"> • Maintain overall responsibility for the project to deliver to client contractual obligations • Act as the primary point of contact, attending all client meetings and key project forums and managing all internal reporting requirements • Implement construction sequencing solutions that minimise disruption to operations and maximise delivery efficiency • Define constructability reviews and processes for seamless interface from design to construction • Develop and implement management strategies to mitigate health and safety risks and promote Next Gear principles • Ensure work health and safety (WHS), rail safety and heavy vehicle national law requirements are applied.

20.2

Role	Responsibility
Construction Manager	<ul style="list-style-type: none"> • Manage on-site works safely • Develop site induction and emergency response procedures • Ensure WHSMP requirements are implemented • Ensure all personnel are inducted and trained • Ensure WHS, rail safety and heavy vehicle national law requirements are implemented.
Commercial Manager	<ul style="list-style-type: none"> • Ensure WHS, rail safety and heavy vehicle national law provisions are detailed in the conditions of contract • Supply contractors with links to Laing O'Rourke's Safety Management System • Ensure all suppliers and subcontractors are selected from the approved supply chain register and have completed a supply chain evaluation.
Design Manager	<ul style="list-style-type: none"> • Monitor the WHS and rail safety input of all consultants and Laing O'Rourke design teams, taking appropriate action where necessary to ensure they fulfil their obligations • Ensure Safety in Design Guidelines and standards are communicated to all relevant consultants • Ensure that measures to eliminate hazards and mitigate risk identified in the project safety hazard log are incorporated into the design • Review the design for compliance with requirements of the client, certifier, statutory authorities, National Construction Code and Australian Standards.
Project Engineers	<ul style="list-style-type: none"> • Support the Construction Manager to ensure the sequencing and delivery of the project works is safe and without risks to health • Maintain site registers, including personnel, vehicle and plant registers. • Contribute to the development of safe work method statements for the conduct of high risk work activities
Site Superintendent	<ul style="list-style-type: none"> • Assist in development of SWMS • Ensure works are done safely in accordance with HSE Plans and SWMS • Ensure contractor's workers are inducted and fit for work • Enforce Rail Safety and HVNL requirements for heavy vehicles entering or leaving site
Work Health and Safety Manager	<ul style="list-style-type: none"> • Support the Project Manager and Construction Manager in developing site induction and emergency response procedures • Report health and safety issues internally and to relevant regulatory bodies, advising any corrective actions necessary and assist in their implementation • Support compliance with the Heavy Vehicle National Law requirements applicable to the project • Develop audit schedule and conduct site audits, inspections and risk assessments as required under Laing O'Rourke procedures or relevant legislation and record the findings and report them to the relevant person • Support compliance with the National Rail Safety Law requirements applicable to the project • Assist in incident investigations • Promote Next Gear principles, mentoring other personnel with tactics and tools.

Table 2: Key safety management roles and responsibilities

2.1 Organisational chart

The organisational chart for the SYAB project, showing the team structure, is provided in Appendix 1.

3. Next Gear

Next Gear is Laing O'Rourke's agenda that builds safety resilience into the organisation, founded on engagement and trust. We place our people at the heart of safety decision-making and focus on understanding safety management successes and the many things that go right.

Next Gear challenges us to move beyond traditional safety practices and measures, by applying a framework described in the three principles:

- People are the solution (as opposed to the problem)
- Safety in the presence of positives (as opposed to the absence of negatives)
- Safety is an ethical responsibility (as opposed to a bureaucratic activity).

Further information on the tactics that support Next Gear can be found at www.nextgearsms.com

4. Safety Management System compliance

In conjunction with Laing O'Rourke's Core and Enabling Processes, Laing O'Rourke's Safety Management System (SMS) provides for the development and implementation of site-specific WHS management and operating systems.

There are four components to the SMS:

1. Organisation and engagement
2. Primary Standards (including Fatal and Severe Risks Controls Standard)
3. Assurance and event management
4. Health, safety and environmental (HSE) information.

Each of these system components has a purpose statement and required control considerations to be included in the local safe work method statements and processes developed to comply with the intent of the SMS.

This WHSMP has been developed and prepared in accordance with the Laing O'Rourke SMS. Where additional information or procedures are required, refer to the System Requirements, Primary Standards and Elements of the SMS available at www.nextgearsms.com

5. Measurement and evaluation

5.1 Objectives and targets

The WHS objectives and targets for this project have been set by the Project Manager, consistent with Laing O'Rourke corporate objectives and targets, the Metro Health & Safety Performance Index (HSPi) Engagement Tours, relevant regional objectives and targets and WHS improvement strategies. Project objectives and targets will be addressed and monitored at the monthly project review and as part of the six-monthly WHSMP review or after a significant change to the project risk assessment (PRA), design risk assessment or to company, project or legislative requirements.

The following table contains the project's WHS objectives and targets.

No.	Objective	Targets/frequency	Responsibility	Record
1.	All personnel trained in Next Gear safety programme	• Within one month of start on site.	• Project Manager	• E-Induct • E-T-8-0907 Certificate Holders Register.
2.	Project Manager to engage with the workforce	• Bi-monthly team briefing.	• Project Manager	• Minutes of meetings • Presentations.

20.2

No.	Objective	Targets/frequency	Responsibility	Record
3.	Health and safety communication with the workforce	<ul style="list-style-type: none"> Daily prestart briefings Biweekly toolbox talks Committee meetings Pit Crew meetings. 	<ul style="list-style-type: none"> Project Manager. 	<ul style="list-style-type: none"> Daily Attendance Briefing record Toolbox talk record Minutes of meetings Minutes of meetings.
4.	Fatal and Severe Risk reviews	<ul style="list-style-type: none"> Top five risks assessed each month 	<ul style="list-style-type: none"> Project Manager. 	<ul style="list-style-type: none"> Fatal and Severe Risk assessment tool.
5.	Collective Insights	<ul style="list-style-type: none"> One per month. 	<ul style="list-style-type: none"> Project Manager Construction Manager. 	<ul style="list-style-type: none"> Collective Insight tool.
6	Positive investigations	<ul style="list-style-type: none"> One per quarter. 	<ul style="list-style-type: none"> Construction Manager Project Engineer. 	<ul style="list-style-type: none"> Presentations.
7	Leadership Engagement Tour	<ul style="list-style-type: none"> One per month 	<ul style="list-style-type: none"> Project Director General Manager 	<ul style="list-style-type: none"> Completed leadership tour
8	Leadership Executive Meetings	<ul style="list-style-type: none"> As per Metro requirements 	<ul style="list-style-type: none"> Project Director General Manager 	<ul style="list-style-type: none"> Meeting attendance record
9	Frontline Leadership Program	<ul style="list-style-type: none"> 100% of Supervisors enrolled 	<ul style="list-style-type: none"> Project Manager 	<ul style="list-style-type: none"> Training attendance record
10	Safety in Design Tours	<ul style="list-style-type: none"> One per month 	<ul style="list-style-type: none"> Design Manager 	<ul style="list-style-type: none"> Attendance record
11	Toolbox talks	<ul style="list-style-type: none"> One per week with one per month on a hygiene topic 	<ul style="list-style-type: none"> Superintendent 	<ul style="list-style-type: none"> Toolbox records
12	Health Assessments	<ul style="list-style-type: none"> 90% pre-employment medicals completed 	<ul style="list-style-type: none"> Project Manager 	<ul style="list-style-type: none"> Human Resources records
13	Hazard reporting	<ul style="list-style-type: none"> >75% submitted by worker 	<ul style="list-style-type: none"> All 	<ul style="list-style-type: none"> Gearbox record
14	Incident Investigations	<ul style="list-style-type: none"> 100% signed off by Project Director 	<ul style="list-style-type: none"> Project Director 	<ul style="list-style-type: none"> Investigation file
15	Incident reporting	<ul style="list-style-type: none"> 100% incidents reported in accordance with Sydney Metro requirements 	<ul style="list-style-type: none"> Project Manager HSE Manager 	<ul style="list-style-type: none"> Incident reports.

Table 6: Health and safety objectives and actions

5.2 Management review

The WHSMP and all appendices must be reviewed:

- Every six months (or as required to suit the phase of the project)
- After a significant change to the PRA or design risk assessment.

It may also be reviewed:

- After a potential or actual Class 1 incident
- After an audit

- After changes to project or legislation requirements.

A summary of the outcome, along with the names of the review attendees and date, will be recorded on the cover page of this plan. The original and subsequent revisions will be approved by the Project Manager. Copies of previous revisions will be archived to demonstrate the review process.

5.3 Routine inspections

A routine inspection of every workplace will be carried out daily and recorded at least weekly. The project will record the responsibility, inspection activity and frequency on the Health and Safety Activity Schedule. The schedule requires the Project Manager to incorporate Fatal and Severe Risk reviews. Items for inspection will be determined by the level of risk current risk to the project and will be monitored by the Project Manager to ensure the workplace is appropriately reviewing site conditions and risks.

5.4 Health and safety leadership engagement

The HSE Leadership Visit Programme provides a vehicle for leaders to engage colleagues and subcontractors to demonstrate HSE leadership behaviours. Engagement involves honest and open discussion about HSE issues in the normal place of work on projects or on the work site. Senior management site safety and environment inspections should be recorded and copies provided to the project for review and close out.

Senior management (including Officers) leadership visits will be carried out in accordance with the Sydney Metro Health and Safety Performance Index (HSPI) to maintain strong coverage while avoiding over-inspection and undue disruption.

Any significant findings will be collated in IMPACT, Laing O'Rourke's incident investigation and reporting system, to generate a review of the WHSMP or hazard and risk management processes specific to the tasks. These will be distributed to the relevant parties.

5.5 Fatal and Severe Risks review

Fatal and Severe Risks (FSRs) will be monitored and assessed for adequacy on a schedule as per the Fatal and Severe Risk Control Monitoring Work Instruction. The Fatal and Severe Risks Controls Standard does not replace the SMS Primary Standards but rather complements their use.

Reviews are used to assess implementation and monitor compliance to the SMS Primary Standards, obtain staff feedback and opportunities to improve the effectiveness of system processes.

Fatal and Severe Risks Controls assessments and audit findings will be reviewed and discussed at the monthly Project Review and Regional Safety Leadership Team meeting.

5.6 Audits

The SYAB project will develop an annual audit schedule that includes internal audits on process, contractors based on risk and performance.

The project team is also obliged to participate in client's audits, regulatory audits and federal audits depending upon the scope of work and the client's requirements.

The audits will be included in the Health and Safety Activity Schedule in Appendix 2.

5.7 Corrective actions

The Project Manager is to ensure any non-conformance that are identified during audits, reviews or inspections and are not immediately rectified are logged in IMPACT for trending, monitoring and close out. The Project Manager may delegate this task for actioning; however, it is his or her responsibility to ensure the IMPACT register is maintained and regularly monitored for timely close out.

The project Corrective Action Register is to be monitored and reviewed for close out by the target dates and for any trending. The review should identify trends such as system weaknesses, improvement opportunities to enhance the project safety management plan and or prompt action to rectify specific reoccurring workplace issues. These items are to be notified via email to the Regional HSE Manager or his nominee for consideration and possible rectification.

Corrective actions should be selectively reviewed for effectiveness via inspections and observations. Corrective actions identified from Potential Class 1 incidents are to be reviewed by Regional Directors.

More information can be found in C-P-8-0107 Continual Improvement, Corrective and Preventive Action.

6. Hazard identification, risk assessment and control

6.1 Arrangements for controlling site risks and hazards

All risk analysis, assessments and SWMSs will be conducted with full consideration of probability, consequence and the hierarchy of control shown in Figure 1.

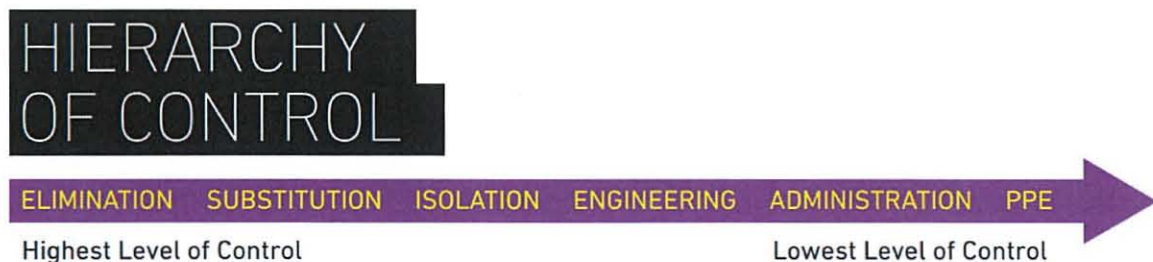


Figure 1: Hierarchy of control

Risk and hazard controls will comply with or exceed minimum requirements contained within legislation, standards and codes of practice and be subject to monitoring and review.

Laing O'Rourke requires the project team to undertake specific training in hazard identification risk assessment and control to effectively partake in the risk management process. Refer to SR01: Risk Assessment and SiD for further detail.

6.1.1 Fatal and Severe Risks (FSR)

The FSR Controls Standard provides clear guidance regarding the various minimum mandatory requirements that must be in place, demonstrated and working effectively with the intent of managing FSRs within our operations.

Embedded into the FSR Controls Standard is our "Go/No Go" operating philosophy. "Critical controls" are considered non-negotiable across Laing O'Rourke workplaces – not implementing these controls effectively could contribute to a potentially significant incident. The Go/No Go

operating philosophy is designed to make it easier for delivery teams to consistently cease the relevant activity and determine appropriate action when the critical controls are not in place.

The Fatal and Severe Risk Control Standard is designed to be used at all stages of construction. For example, it can be used as audit tool after an activity to confirm the critical controls were in place. However, it is more important to use the tool throughout the earlier cycles of design, planning, procurement and Design Engineering, to ensure critical controls are in place to prevent fatalities and injuries arising from any activities associated with FSRs.

FSRs and critical controls should be a focus (but not the only focus) when planning and assessing risks.

6.1.2 Safety in Design (SiD)

The Project Manager will appoint an appropriately qualified and experienced person to manage the SiD process on the project.

The SiD system is designed to maintain the safety of all those building the project, and the users of the design, by implementing the hierarchy of control, from the start of the bid stage through the design, construction, maintenance and demolition stages. The SiD system is used on all projects to identify, eliminate or reduce risks to being as low as reasonably practicable (ALARP) and to communicate those residual risks to project stakeholders.

“SiD Standards for SiD Coordinators” outlines our requirements and procedures for implementing SiD on the project. The principles include:

- Producing a SiD Action Plan that documents how SiD will be executed across the entire project
- Undertaking SiD reviews and workshops as early as possible in the design process, as well as further reviews and workshops in later stages of design development. Workshops will be facilitated by a person competent in SiD. They will gather information from previous SiD assessments and hazard and operational analyses (HAZOPs) to share at the workshops, which will be attended by all relevant stakeholders throughout the design lifecycle
- Maintaining a SiD Risk Register, which will be prepared during the workshop. The register will document hazards associated with the design elements, as well as probability and consequence of the risk. Where risks are not already ALARP, control measures and alternative designs will be documented along with the residual risk. The outcomes will then be communicated to all relevant stakeholders through a SiD Report.

Any construction or end user residual risks documented on the SiD Risk Register will be carried over onto the Project Risk Register. Design change requests will also be documented and a register maintained.

6.1.3 Project risk assessment (PRA)

The Project Manager will convene a risk workshop comprising senior production and safety representatives to produce the E-T-8-0938 Project and Workplace Risk Assessment before work starts. This is a high-level risk analysis that incorporates any SiD residual risks and records the procurement and construction phase risks. This includes public safety hazards associated with the company's operations, products, services and first aid requirements and allocating ratings, control measures and residual risk ratings. It will be used to guide Laing O'Rourke and subcontractors in preparing and reviewing their safe work method statements (SWMSs). Risk controls must comply with or exceed requirements of legislation, codes and standards.

The E-T-8-0938 Project and Workplace Risk Assessment Probability and Consequence risk tables scoring system is a tool to measure the perceived risk level. The scoring system is:

- 0–6: Acceptable – Go
- 7–12: Acceptable with strict adherence to control measures
- 13–25: Unacceptable – No Go.

Any activity with a residual risk rating of greater than 13 (unacceptable) must be abandoned and a safer alternative solution found and reassessed in line with our Go/No Go philosophy. Risks will be prioritised, with higher residual risk scores assigned higher priorities.

The risk assessment process will refer to the SMS, Primary Standards, SiD Register, Project Risk Register, construction programme, information from company WHS subscriptions, learning bulletins and safety alerts for direction and consideration in compiling E-T-8-0938 Project and the PRA. Project-specific hazards and risks are documented in the Project Risk Assessment in Appendix 3 and are subject to subsequent reviews.

The PRA will be reviewed at intervals no greater than six months. While the whole risk assessment will be reviewed, those activities with the higher residual risk score will be prioritised. The PRA will also be reviewed as required to suit the project phase; after a significant change to the design risk assessment; significant change in scope; potential Class 1 or actual Class 1 incident; or change in company, project or legislative requirements. If required, PRA and associated SWMS, work pack or equivalent system will be revised and communicated to the affected workers.

6.1.4 Safe work method statements

The SWMS procedure involves the following three processes:

- E-T-8-0971a Safe Work Method Statement (risk assessment process)
- E-T-8-0971b SWMS Review Checklist
- E-T-8-0971c SWMS Task Observation.

6.1.4.1 Step 1: SWMS

All SMWSs must be task-specific and must be in place for all high risk activities on site as per SR 02: SWMS and Daily Activity Briefings. SWMSs must be developed in consultation with workers (or a nominated representative) and those supervising the works. The high-level control measures that are outlined in the PRA in Appendix 3 should be addressed in more detail in the SWMSs.

Developing the SWMSs may identify new or unforeseen workforce requirements that require additional training for a particular skill set, health and safety or environmental tasks. These will be relayed to the Project Manager for approval and actioning.

SWMSs for high risk work activities (as defined) will be reviewed on a monthly basis with all non-high risk work SWMS reviewed quarterly. The SWMS will also be reviewed when there is a change in activity, system, design, plant, legislative or company requirement. Reviews will be conducted via a task observation and reviewed for suitability and effectiveness. Any changes made to a SWMS must be made in consultation with the work crew who will be performing these works.

A register of all SWMS will be maintained using form E-T-8-0977 Work Method Statements Review Register.

6.1.4.2 Step 2: SWMS review checklist

Before works covered by a SWMS can begin, the SWMS must be reviewed and assessed as compliant to the requirements of the E-T-8-0971B SWMS – Part B Review Checklist. This checklist includes the specific requirements of items such as legislation, Codes, Standards, qualifications and plant.

A SWMS may also be reviewed after design changes or variations or after a significant incident or trend. Any non-conformances or “No” answers must be actioned prior to work commencing. The actions needed to close out the non-conformance must be recorded on the comments page of the checklist.

6.1.4.3 Step 3: Task observation

The E-T-8-0971c SWMS Task Observation process assesses if the works detailed in a SWMS are being carried out in the method described and that the documented control measures are in place, being used and effective – that is, work as imagined versus work as done.

The process also provides an opportunity to observe the skill levels of workers, the effectiveness of training to date and possible training needs for individuals. It also allows workers to report any hazards and raise any safety concerns that they may have regarding the task.

6.2 **Project-specific risk**

Through a preliminary review of the SYAB project risks, the following risks (and corresponding mitigation measures) have been identified:

- Rail operations
- Safety interface
- Traffic management and logistics
- Crane and lifting operations
- Excavations
- Electrical safety
- Hazardous chemicals
- Plant and structures
- Heavy Vehicle National Law requirements

Upon development of the PRA, any changes to the major risks and mitigation strategies will be outlined below.

6.2.1 Rail operations

The following measures will be implemented:

- Laing O’Rourke’s Primary Standard (PS) 14: Rail Operations is to be applied to all rail operations
- A specific Rail Safety Management Plan will be prepared for construction aspects that are subject to the Rail Safety National Law (RSNL).
- All personnel will be trained and competent to undertake the scope of works.
- Work and controls requirements will meet that of the Rail Infrastructure Manger (RIM).

- All rolling stock must conform to the RIM's criteria and systems and the systems that Laing O'Rourke has for managing rolling stock.
- Selections of the highest level of safe working arrangement that must be in place to eliminate the risk of being struck by trains or other rolling stock.
- Exclusion zones and engineering controls will be applied to prevent fouling of live tracks or workers straying onto live tracks.
- All possession works will be in accordance with the Sydney Train's possession coordination process and local possession authority and the Sydney Trains SMS where applicable.

6.2.2 Safety interface

The following measures will be implemented:

- Safety interfaces with other rail operating organisations will be maintained, as well as the control of risk between the organisations necessary to comply with the RIM's obligations.
- Organisations will be aware of each other's respective roles and responsibilities in controlling risk associated with the project's scope of works
- The level and exchange of information between organisations in respect of joint risk management will be determined.
- The triggers and frequency of monitoring and reporting to each organisation will be agreed
- The party responsible for implementing or maintaining risk control and the timescale for its implementation will be determined.
- The change management life cycle will be managed as the project progresses and new interfaces are identified, providing new control measures.
- Emergency contact details will be established and maintained throughout the project lifecycle.

6.2.3 Traffic management and logistics

A Traffic Management Plan (TMP) must be developed to provide safe access for the public and motorists on roads and footpaths adjacent to the project works. The plan will:

- Ensure all approvals from local road authorities are approved prior to implementing and meet the level of risk identified as part of the planning requirements
- Take account and address external traffic requirements of other construction or event management activities
- Ensure that, where possible, all deliveries are planned to avoid peak hour traffic (morning and afternoon)
- Provide for separation of people and plant, minimising reversing or turning locations between the site sheds and works area and other areas with a concentration of people
- Ensure all signs and devices are placed in the most advantageous positions with regard for the location and nature of the hazard, with the warning conveyed to provide the maximum visual impact for approaching traffic.
- Ensure that any Traffic Controller engaged holds the relevant qualification and maintains a log book of traffic control related information.

6.2.4 Crane and lifting operations

The following requirements will apply for crane and lifting operations:

- A Lifting Operations Plan must be developed by the appointed person, with reference to the guidance material, that describes in detail the specific risk associated with the project.
- A schedule of common lifts must be developed as part of the lifting operations plan for regular (non-high-risk) lifting activities.
- Lifting operations are to be undertaken in accordance with the lifting operations plan, schedule of common lifts or specific lift plan/analysed by a Laing O'Rourke Appointed Person.
- All plant used for lifting activities must undergo the premobilisation process as per PS02: Plant and Equipment and approved by an appointed person.
- Earth moving equipment must only be used as a crane when the plant is assessed and approved for lifting by the appointed person.
- Loads must be slung and lifted by competent and licensed doggers and operators who hold the relevant high-risk work license.
- Crane safe certification must be verified along with premobilisation checksheets E-C-8-0520c Mobile, Crawler Crane Check sheet.
- Barriers and exclusion zones must be established, with clear signage in place for all lifting activities undertaken by mobile cranes or earth moving equipment.
- Lifting equipment certification and registers must contain the relevant certificates for equipment to be used.

6.2.5 Excavations

The following requirements will apply for excavation works:

- All excavations have a work methodology that prevents collapse of the excavation.
- A SWMS must be in place for all excavations greater than 1.5m depth in accordance with SR 02: SWMS and Daily Activity Briefings. SWMS may also need to be supplied to asset owners.
- Roads and traffic management plans around excavations are designed to ensure plant and people segregation and management of spoil.
- Temporary works for all excavations are reviewed by the appointed Temporary Works Coordinator, and regular inspections are completed and recorded on a Temporary Works Control Register.
- Simultaneous interface of temporary works is controlled.
- Design and redesign activities are carried out so the overhead or underground services interface is eliminated or reduced so far as is reasonably practicable.
- Permits to excavate must be issued by authorised issuers and contain service information and local Dial Before You Dig (DBYD) contact information.
- Services are to be positively identified and verified using non-destructive means of potholing and referring to underground essential services information about the area at the workplace where the work is occurring.
- Live services are de-energised wherever possible and verified as such.

- Underground and overhead exclusion distances are identified and adhered to.
- Excavation risks are assessed and geotechnical reports obtained wherever a risk of collapse is identified. Other risks to be managed include:
 - A person falling into an excavation
 - A person working in an excavation being struck by a falling thing or plant
 - A person working in an excavation being exposed to airborne contaminant such as heavier than air gases including exhaust fumes
 - A sudden inrush of water and flooding.
- Shoring and benching/battering are in place as per the geotechnical design.
- Exclusion zones for material, spoil and plant surrounding excavations are maintained and clearly delineated.

6.2.6 Electrical safety

When working around electrical system either above or below ground, the following process must be adhered to:

- Work on electrical installations must be undertaken by competent and licensed electricians in accordance with PS 06: Energised Plant Isolations and Lockout and FSR7 Electrical safety.
- Current electrical drawings and electrical systems data must readily available, including detailed site survey (DSS) and DBYD information.
- In planning for electrical works, the following has been considered:
 - Compliance requirements and safe routes of temporary services both in-ground and surface mounted
 - Construction impact on electrical installations and potential hazards associated with the electrical power supply methods planned
 - Interaction between trades and any competing power requirements
 - Availability of electrical power supply, electrical plant and equipment, as well as the location of switchboards
 - Possible use of generator sets and/or minimising the use of electrical equipment by implementing battery-operated alternatives
 - Clearance requirements in front of switchboards (minimum 1m)
 - Proximity of persons to electrical plant
 - Testing and tagging requirements
 - The Low Voltage Work Risk Checklist must be completed
 - Rescue requirements for activities where live works are unavoidable, such as testing and commissioning.
- The use of portable generators must be limited to work of a short duration or one-off applications.
- Unless tested for dead, all wires and equipment are to be treated as live.
- Personnel undertaking electrical work must be trained and competent.

- Temporary electrical works must be installed, tested and commissioned to the Australian Standard.
- All circuits and powered equipment must have residual-current device (RCD) protection.
- Switchboards must be compliant and secured.
- All energy sources must be clearly identified and marked.
- Live cabling must be protected from mechanical damage.
- Work in and around electrical infrastructure must be effectively managed.

6.2.7 Hazardous chemicals

The current Safety Data Sheet (SDS) Register of suspected or known hazardous chemicals must be reviewed before any purchases are made for the project. Applicable first aid supplies must be available on site where required.

Risk assessments must be completed on any product that is deemed hazardous or harmful to humans or the environment. This can be done through the Chemwatch Gold FFX or documented on E-T-8-0984 Hazardous Substance Risk Assessment. If the chemical requires health assessment or monitoring, it will be rejected and substituted for a less hazardous product.

Hazardous chemicals and dangerous goods must be stored in accordance with the requirements of the SDS, adhering to the segregation and ventilation requirements, and a register maintained on site. This can be a manual register using E-T-8-0980 Hazardous Substances and the SDS Register or may be created online using the Chemwatch Gold FFX System (Refer to PS 18: Hazardous Substances); however, it is recommended a hard copy is printed following each update and distributed to the First Aid Officer and project safety department.

The project Work Health and Safety Manager will ensure the hazardous chemical register is kept in the first aid room, along with the current SDS for each chemical at all times. The SDS should be readily available at the storage location and point of use.

6.2.7.1 Health monitoring or assessment

Those workers exposed to or using a hazardous chemical must sign the risk assessment and SWMS to confirm they understand the appropriate controls. In the site files, Laing O'Rourke will maintain all SWMS, risk assessments, induction and training records, as well as copies of all subcontractors' documents for the use of hazardous chemicals on site.

Where workplace monitoring is required, the type of equipment and how it is installed, maintained and stored must be clearly defined in the SWMS. The operation will only be performed by competent people with equipment calibrated by an ISO 9001 or NATA-certified laboratory. Copies of these records will be maintained on site. Workplace monitoring requirements may include:

- Chemical exposure, including dust and fibres
- Noise level
- Lighting levels
- Radiation exposure.

In exceptional cases, where a chemical that requires health assessment or monitoring must be used or workers are exposed via demolition works or contamination, those performing the works

will be informed of the health monitoring programme and requirements. A person conducting a business undertaking (PCBU) must ensure that health monitoring is provided to a worker if:

- They are carrying out ongoing work using, handling, generating or storing hazardous chemicals and there is a significant risk to the worker's health because of exposure to a hazardous chemical mentioned in WHS Regulation Schedule 14, table 14.1, column 2
- There is a significant risk the worker will be exposed to a hazardous chemical (other than a hazardous chemical mentioned in Schedule 14, table 14.1) and either:
 - Valid techniques are available to detect the effect on the worker's health
 - Valid techniques of determining biological exposure to the hazardous chemical is available and it is uncertain, on reasonable grounds, whether the exposure to the hazardous chemical has resulted in the biological exposure standard being exceeded.

Unplanned workplace exposure monitoring programmes not identified in the risk assessment will be investigated and may lead to corrective actions or amendment to system processes. Records of health surveillance will be maintained as secure and confidential for the statutory period by the company.

6.2.8 Plant and structures

6.2.8.1 Plant risk assessment and acceptance criteria

All plant and structures will comply with relevant Australian Standards. Where there is no relevant Australian Standard, the equivalent international standard will apply. Items of plant and structures, where applicable, will be registered and the design registered as required under WHS legislation.

Each item of powered mobile plant must be risk assessed with consideration of its different lifecycle phases – including procurement, delivery, loading, unloading, operation, maintenance, service and inspections. The purpose and scope of work specific to the plant and site conditions must also be considered. [E-T-8-0938 Plant Risk Assessment](#) may be used to undertake that assessment (or plant assessor if applicable).

The following requirements apply to all construction plant and equipment operating on site:

- Plant is maintained and serviced as required in accordance with the original equipment manufacturer (OEM) maintenance schedules
- Excavators are fitted with fully automatic quick hitch assemblies
- Plant is inspected before mobilisation and before use by a competent person
- A verification of competency (VOC) of operators is conducted
- Plant and people are separated and the defined work areas approved by the supervisor
- Stability and ground bearing pressure are verified for plant set up on outriggers
- Rolling object protection system (ROPS) and falling object protection system (FOPS) are verified and fitted to plant in compliance with the regulations and risk assessment
- All quick-hitches are the fully automatic double-locking hydraulic type to prevent attachments from falling and swinging in accordance with SM PS-ST-221
- All warning devices are operable and a positive way to communicate is in place

- Plant and vehicles are parked in a stable condition (chocks are fitted if fundamental stability is not achieved)
- Plant is only used for the purpose for which it was designed unless it is determined the proposed use does not increase the risk to health and safety
- Plant used for loading and offloading operations is fitted with a load indicator/weight measuring device.

Plant on site will be recorded on the E-T-8-1553 Plant and Equipment Register or electronic equivalent.

6.2.8.2 Identification of ROPS and FOPS

ROPS designed and tested in accordance with AS 2294 must have a permanent label attached in a prominent position where it can be easily read and where damage by weather or abrasion is minimised. The label should contain the following information:

- The name and address of the manufacturer of the structure
- The type and serial number of the structure, if any
- The make and model of the plant that the structure is designed to fit
- The number of the standard or code that the ROPS meets, its approval number under that code, if applicable, and the name of the testing station
- Any other information deemed appropriate (for example, the installation date).

Following any repairs or modifications, an additional label should be put on the frame stating the repairs or modifications that have been made, when they were made and by whom.

Unauthorised removal of ROPS or FOPS is not to occur without express approval from the Project Manager in consultation with subject matter experts from Select, Laing O'Rourke's plant hire subsidiary.

6.2.8.3 Plant stand-down process

Should any plant be found to be defective or require immediate repair, or if the logbook, plant risk assessment or other required documentation is unacceptable, the plant is to be stood down and parked, the key removed, and the plant locked (if possible) and tagged as "out of service" or removed from site.

Reinspection by a Laing O'Rourke representative using the original Pre-Mobilisation Plant and Operator Checklist will be conducted before the plant can be used on site.

6.2.8.4 Subcontractor plant and structures

Before an item of powered mobile plant arrives on site, subcontractors must provide to Laing O'Rourke the following:

- Service reports and history (previous 12 months) complying with the OEM manual's requirements (the item of plant must be accompanied by a copy of the OEM manual)
- Plant risk assessment
- SWMS incorporating all hazards for the use of the item of plant
- Premobilisation report carried out by the supplier of the item of plant

- Confirmation of the operator's competence to safely operate the item of plant
- Daily Inspection Book (logbook) specific to the needs of the OEM manual. The operator of each item of plant must conduct an inspection and record this in the logbook each day the plant is used. Where any fault that affects the operational safety of the plant is identified, the operator must isolate the plant from service until the fault is fixed.

6.2.9 Heavy Vehicle National Law requirements

The Heavy Vehicle National Law (HVNL) is overseen by the National Heavy Vehicle Regulator (NHVR). State and territory police, as well as authorised officers, are appointed to enforce offences under the HVNL.

The HVNL is supported by four Heavy Vehicle National Regulations (HVNRs):

- Heavy Vehicle (Fatigue Management) National Regulation
- Heavy Vehicle (General) National Regulation
- Heavy Vehicle (Mass, Dimension and Loading) National Regulation
- Heavy Vehicle (Vehicle Standards) National Regulation.

The heavy vehicle laws apply to vehicles over 4.5t gross vehicle mass (GVM) and fatigue-regulated heavy vehicles. It does not apply to heavy vehicle activities on private roads or work areas that are not accessible to the public; however, hours of work in these areas remain applicable to the calculation of working hours for the management of fatigue.

Laing O'Rourke heavy vehicle drivers and contractor heavy vehicle drivers will be required to comply with all facets of the HVNL, including:

- Loading and unloading
- Fatigue management
- Load restraint
- Diary entries.

7. Permits to work

A PRA will be undertaken to determine which of the following permits to work will be applicable to the project:

- Confined space, hot work, excavation, electrical work isolation, plant isolation, crane workbox, asbestos removal, grid mesh, flooring and handrail removal and working at heights.

More information is provided in PS 22: Permits to Work.

Permit issuers and permit holders will be appointed by the Project Manager and trained in their roles and responsibilities prior to issuing any permit. Work parties will be informed of the permit-to-work system in the project induction.

The SYAB project will use the process defined in PS 06: Energised Plant, Isolations and Lockouts where identified in the PRA as required and where equipment is to be transitioned from construction to commissioned assets.

8. Change management

Change will be managed in accordance with SR06: Change Management.

There are various processes and forms that support risk analysis, management and communication of change. These include Design Change, PRA, SWMSs, Collective Insights, plant hazard assessments, chemical risk assessments, prestart meetings and toolbox meetings. Where these don't effectively support the change management, then the workplace shall identify a suitable alternative, such as the LORAC template E-T-8-0992 Change Request form.

9. Emergency preparedness and response

9.1 Emergency procedures, evacuation and drills

Appendix 5 contains the Emergency Response Plan, which will be developed by the Construction Manager in consultation with appropriately trained personnel. It will contain details of emergency procedures, evacuations and drills. The type and location of emergency equipment will be planned and assessed by a suitably competent person. The emergency planning will be subject to the regular review process as part of the overall WHSMP, with rescue plans incorporated where required. This is documented in SR10: Emergency Planning and Response.

9.2 Communicating emergency procedures

Site and visitor inductions will be used to communicate the project emergency procedures and plans to all personnel on the project and visitors to the site. All visitors will be escorted by an inducted person at all times while on the site (refer to Section 13.2: Inductions).

Emergency response arrangements, evacuation points and emergency contact personnel will be displayed on the site noticeboard, meeting and crib rooms and included in the daily protection officers briefing where personnel are working away from the main compound locations.

9.3 Emergency drills

Practical application and understanding will be demonstrated during drills and documented on the E-T-8-0997 Emergency Response Drill Record. Analysis of the drill record will confirm the effectiveness of the location of emergency equipment, warning devices, signage, additional training requirements, and evacuation routes, muster points and the need for any improvements.

Emergency drills will be conducted and documented in full on E-T-8-0997 Emergency Response Drill Record at intervals not exceeding six months or after an emergency situation. Emergency plans will be reviewed quarterly and revised as necessary to meet the phase of construction. Defence will be notified and approval sought before any emergency drills are conducted.

9.4 Training and competencies of emergency personnel

The Emergency Response Coordinator and other emergency response personnel, as required, will have clearly defined roles and responsibilities and will be formally appointed to their positions by the Project Manager.

External parties may be engaged to conduct the assessment of fire, emergency and rescue equipment. Records of competency will be retained in the contract files.

9.5 Emergency management of dangerous goods and hazardous chemicals

Dangerous goods and hazardous chemicals will be managed in accordance with the requirements in Section 6.2.7 of this plan. Registers of the hazardous and dangerous chemicals on the site will be maintained and available to the Emergency Response Coordinator in the case of an emergency.

10. Incident management

Incidents are classified into the three classes outlined in Table 7.

20.2

Incident	Example
Class 1 injuries alter the future of an individual permanently.	<ul style="list-style-type: none"> Fatality, quadriplegia/paraplegia, amputation Impaired back, disfigurement, psychological disturbance.
Class 2 injuries alter the future of an individual temporarily.	<ul style="list-style-type: none"> Fractures, contusions, sprains, lacerations requiring sutures.
Class 3 injuries do no more than inconvenience the person. This injury causes discomfort but allows the person to quickly return to carry out their normal duties.	<ul style="list-style-type: none"> Minor cuts and bruises.

Table 7: Incident classifications

10.1 Incident notification and reporting

The Project Manager must be informed of any incidents on site as quickly as possible. For all actual and potential Class 1 incidents, the Project Manager is responsible for ensuring the following personnel are notified verbally within one hour of the incident occurring:

- Regional HSE Manager
- Operational General Managers
- Regional Director
- General Manager HSE
- TfNSW and Sydney Metro clients
- Sydney Trains (when working under its possession system).

All incident reporting and investigation must be recorded in IMPACT as soon as possible and no longer than 24 hours after the incident occurring. IMPACT can be accessed from iGATE or remotely via the internet where direct access to iGATE is not available. If there is no intranet or internet connection, the documents C-T-8-0918 Incident Investigation and E-T-8-0918 Incident Investigation must be used. These completed documents must then be forwarded to a location where the information can be inputted into IMPACT.

10.1.1 Notification to authorities and regulators

The following are notifiable incidents:

- The death of a person
- Serious injury or illness of a person
- A dangerous incident.

The Regional HSE Manager will report all notifiable incidents to the relevant state and federal authorities as required under relevant acts and regulations. The regulator is to be notified immediately after a notifiable incident occurs on the worksite. A record of all notifications will be kept. The relevant authorities include:

- Work Safe NSW
- Office of the National Rail Safety Regulator (ONRSR).

Notifications to various other regulators and authorities are required by dangerous goods, electrical, mine, rail and workers' compensation acts and regulations, as well as the relevant health and safety legislation in the area of jurisdiction. The Regional HSE Manager will be consulted on all regulator notifications.

10.2 Assistance, rehabilitation and return to work programme

10.2.1 Assistance

Each person can be affected by and deal with stress and trauma differently following an incident. Some require professional assistance – either physically or emotionally or both. Laing O'Rourke has retained the services of PPC Worldwide, an international organisation that specialises in employee wellbeing. PPC has free and confidential access to professionally qualified counsellors and support services to assist in times of personal or family need.

All face-to-face counselling sessions are provided off-site at one of PPC Worldwide's national counselling locations. Alternatively, counselling is available 24 hours a day, seven days a week over the phone on 1300 361 008. Great care is taken to maintain and ensure the privacy and confidentiality of users. Should the service be used, the only information relayed to Laing O'Rourke is statistical reports on patterns of use. No personal identifying information is contained in the reports.

10.2.2 Rehabilitation and return-to-work programme

An injured worker who is required to attend a medical centre or see a specialist medical practitioner must be accompanied by a Laing O'Rourke representative or Return to Work Coordinator. A copy of the Important Information for Treating Doctor must be taken to the appointment where possible. Where this is not practical, the letter should be forwarded to the treating medical practitioner as soon as possible. For direct company employees, the medical certificate and accounts for the treatment of the injured worker must be sent with the completed claim form to the National Workers' Compensation Claims Manager. All subcontractors are responsible for managing their own compensation claims and developing return-to-work programmes before a worker is permitted to return to the project.

The full process can be found in SR 13: Injury Management and Return to Work.

10.3 Director involvement protocol

Where a Potential Class 1 incident has occurred the Project Manager must provide a status report immediately to the Regional Director and General Manager for HSE and a response will be managed in accordance with SR12: Event Management and Reporting.

10.4 Incident investigation

The following procedures will be followed when investigating incidents.

10.4.1 Scene preservation

The Project Manager will ensure there is no continued risk to health and safety and that the scene is not disturbed until facts are established. If the incident is notifiable to the regulatory authority, the scene will not be disturbed until there is approval from the regulator.

10.4.2 Investigation

At least one investigation team member will have been trained in the company-approved investigation techniques. For Class 1 actual or potential incidents, investigations must be completed by a person trained in the chosen methodology as determined by the Regional HSE Manager.

Where a Class 1 actual incident has occurred, the Regional HSE Manager and Regional Director will initiate the investigation and allocate responsibilities. An external consultant may be engaged. This will occur within 24 hours.

Findings from the investigation, such as corrective actions and recommendations, will be used by the project Work Health and Safety Manager to review all relevant risk assessments, SWMSs, checklists, SMS System Requirements and Primary Standards for required changes and their subsequent implementation and monitoring through the WHSMP review process.

Corrective actions will be developed to address each causal factor. The Work Health and Safety Manager will ensure all corrective actions and causal factors are logged in IMPACT. The Regional HSE Manager or nominee will refer any identified recommendations for SMS changes to the HSE Director or their nominee.

10.5 Communication and sharing lessons

Sharing lessons may take several forms including:

- HSE bulletins, which are generated if incidents findings need to be communicated internally across a project or to another project or workplaces. For distribution outside the project, the bulletins will be forwarded to the Regional HSE Manager or nominee, who will distribute them through the central HSE team. At a project level, the bulletins should be communicated to the Health and Safety Committee and posted on the project noticeboard.
- Safety alerts are designed to prevent a repeat of an incident. All safety alerts must be approved by the HSE General Manager or nominee before distribution.

The bulletins and alerts may be distributed by email or uploaded to iGATE. At a project level, they should be communicated to the Health and Safety Committee, posted on the project noticeboard and presented as toolbox talks, as appropriate.

10.6 Monthly statistical reporting

All projects, offices and workplaces have a unique reporting page within IMPACT to provide statistical information and monitor the health and safety performance. The statistical data collected on the project will form part of the C-T-8-0742 Contract Review. This information is used as a tool to assist in trend analysis. The reports are reviewed by senior management at the Regional Safety Leadership Team and Hub Safety Board meetings and reported to the Europe Hub globally for review and monitoring.

11. Whole-of-project consultation and engagement

Laing O'Rourke is committed to maintaining communication and encouraging consultation, cooperation and coordination of duties with all duty holders, work groups and subcontractors. SR03: Consultation and HS Meetings describes the minimum requirements for consultation to be implemented at the project. The following methods of consultation and coordination will be used on the SYAB project to support the Next Gear agenda and to meet legislative requirements.

11.1 Health and Safety Policy

The current Health and Safety Policy (contained in Appendix 6) will be communicated to workers, subcontractors and other organisations by the following methods:

- Displayed in the project reception/visitor area and on the site noticeboard
- Included in the site-specific induction
- Included in tender documentation sent to subcontractors.

11.2 Health and safety representatives

The process of electing health and safety representatives must be documented to show which work group elected which representative. Each representative must undergo the requisite training, including:

- An initial health and safety training course after being elected
- A one-day refresher training each year starting one year after the initial training.

11.3 Health and Safety Committee

The workplace may establish a Health and Safety Committee for the purposes of consulting with work groups as per legislative requirements. The committee will meet at intervals agreed by its members and documented within its constitution. The minutes of the meeting will be made available to the workforce using different methods, including noticeboards, multimedia and/or digital copies.

11.4 Pit Crew

The workplace may establish a Pit Crew to investigate opportunities for improvement in the application of the Next Gear principles at the workplace. Membership of the Pit Crew is at the discretion of the project team and will be an informal network of personnel who takes an active interest and involvement in the application of these principles.

11.5 Collective insights

The workplace will hold collective insights at regular intervals to obtain direct feedback from work groups on activities that they are involved in to identify areas that are working well as well as areas for improvement. The collective insights process may be recorded on the form available within the SMS or using other digital or multimedia methods, providing the method used accurately captures the items discussed at the session and the persons in attendance.

11.6 Investigating for success

The workplace will undertake investigations into high-risk activities that are completed successfully to understand conditions that led to that success. Lessons learnt will be distributed across the workplace as necessary. To allow for innovative methods of capturing this information, no set form is prescribed; however, completed records of the activity taking place should be recorded in IMPACT.

11.7 Pit stops

The workplace may undertake a "pit stop" to understand the gap between works as imagined versus work as done. Pit stops may be a formal recorded session or informal sessions intended to identify opportunities to build resilience and contingency. Where critical issues are identified during a pit stop, this may lead to a collective insight or investigation for success to more formally interrogate the identified issue.

11.8 Toolbox talks

The workplace will hold toolbox talks at regular intervals to disseminate important safety information, changes and updates. These toolbox talks will provide another venue for consultation and coordination of activities. Toolbox talks may be recorded on the form available within the SMS or using other digital or multimedia methods, providing the method used accurately captures the items discussed at the session and the persons in attendance.

11.9 Daily activity briefings and pretask briefings

The workplace will hold pretask briefings to coordinate workplace activities and to highlight risks and controls pertinent to completing the task safely. Pretask briefings may be recorded on the form available within the SMS or using other digital or multimedia methods, providing the method used accurately captures the items discussed at the briefing and the persons in attendance.

11.10 Contractor coordination meetings

The workplace will hold contractor coordination meetings to understand the requirements and constraints of the project and to enable a comprehensive planning approach to the T-minus possession planning process. Contractor coordination meetings allow for consultation with the contractor's management team as well as provide a forum for lateral consultation between contractors to self-manage their interfaces safely.

11.11 Observation reporting

All workers will be encouraged to report any hazards and positive observations they may observe. The project will establish observation reporting mechanisms, including noticeboards, observation cards and the use of the Gearbox Mobile application for the project team to report concerns and to encourage innovative ways of work.

All reported observations will be entered onto IMPACT. Feedback will be provided on actions taken and lessons learned.

11.12 Other workplace-specific consultation methods

The following table outlines other workplace-specific consultation methods for this project.

Method	Frequency	By whom
Toolbox talks	Minimum once per week	Project Manager, manager/supervisor with direct control
Health and Safety Committee	As per the Health and Safety Committee Constitution	Project Manager, Project Manager, Work Health and Safety Manager or advisor, workforce representation
Emergency meetings	As required by Laing O'Rourke	Project Manager, Work Health and Safety Manager
Written instructions	As required	Manager/supervisor with direct control
Verbal instructions	As required	Manager/supervisor with direct control
Walkabouts	Daily	Manager/supervisor with direct control
Design coordination meetings	To be agreed by Project Manager	Project Manager, Senior Project Engineer, Design Manager
Works coordination meetings	As required	Manager/supervisor with direct control, project engineers
SWMS	Each activity	Those conducting the works
SWMS reviews	As required on the SWMS	Project-specific procedure

Table 2: Methods for communication and consultation

11.13 Consultation with others

Health and safety issues will be communicated to other groups using the methods outlined in Table 3.

Group	Consultation and communication method
Client and client's representative	<ul style="list-style-type: none"> • Weekly meeting • Monthly report • Formal correspondence through agreed document transmittal system.
Designers	<ul style="list-style-type: none"> • Design coordination meetings • Design risk review meetings • Formal correspondence such as document transmittal and requests for information (RFIs).
Employees, site workers, and subcontractors	<ul style="list-style-type: none"> • HSE inductions • Learning bulletins (distributed each month and saved on iGATE) • Project health and safety noticeboards • Signs and posters • Conferring with elected health and safety representatives • Weekly Health and Safety Committee meetings • Collective insights • Task observation • SMS Direct • Development and review of SWMSs • Daily pretask meetings • Weekly toolbox talks • Risk assessments • Site instructions • Daily start-up procedure • Asite memos.
Site supervision team and other duty holders	A daily coordination meeting will be held to review plant and vehicle movements and to consult, cooperate and coordinate other high-risk construction activities. This meeting will be documented and required actions communicated to the site work teams by way of the daily activity briefing or other formal documentation.

Table 3: Communication with other groups

12. Selection and control of contractors and suppliers

The procedure for selecting and evaluating subcontractors is set out in SR05: Supply Chain Management. Project-specific arrangements for the selection of contractors include:

- HSEQ audit evaluation
- Consultation on previous projects
- Contractor presentation to project team on integration and cultural approach.

The following documents will be provided to subcontractors as part of the procurement and engagement process:

- SR00: Next Gear
- This WHSMP
- The PRA
- The WHS standard terms and conditions of contract
- The Fatal and Severe Risks Controls Standard
- Applicable Primary Standards (or links to the relevant standards).

Contractors will also have ready access to the Laing O'Rourke SMS via www.nextgearsms.com

All subcontractors will be required to:

- Review and comply with the relevant sections of the Laing O'Rourke WHSMP, Fatal and Severe Risks Controls Standard and Primary Standards.
- Provide a copy of their SWMSs, work packs or equivalent at least seven days before their planned start on site, or as instructed by Laing O'Rourke.
- Develop their SWMSs and work packs in consultation with those who will perform the tasks.
- Provide copies of general induction cards or other written evidence of general induction at least seven days before their planned start on site for each of the subcontractor workers about to start work on site.
- Adhere to the provisions of this WHSMP, approved hazard and risk management processes, SMS Primary Standards and comply with all statutory health and safety acts and regulations, advisory standards and codes of practice as amended.
- Observe all contract conditions for health and safety and follow site instructions issued by the Laing O'Rourke project management team.
- Provide adequate training to their workers to allow them to perform their tasks safely and proficiently. Training will include a work activity induction including consultation and explanation of hazard and risk management processes. Additional training must be provided when any amendments relevant to the subcontractor's work are made to the WHSMP.
- Supervise workers under their control at all times.
- Provide evidence that plant and equipment is maintained and instruct workers in the safe use of such equipment.
- Provide Laing O'Rourke with a plant register and relevant records for all plant arriving on the project.
- Ensure the orderly conduct of their scope of works so site activities do not put at risk workers, or members of the public on or near the project.

13. Project health and safety training

Refer to SR08 Onboarding, Training, Induction and VOC for the minimum requirements and methodology for health and safety training. Project-specific arrangements are outlined at appendix 9 of this plan.

13.1 Sydney Metro Industry Curriculum

Laing O'Rourke will ensure that all persons working on the SYAB project and identified in one of the categories in the Sydney Metro Industry Curriculum will attend and complete that required training pursuant to Sydney Metro requirements.

13.2 Inductions

Table 4 outlines the inductions to be undertaken before personnel enter and start work on site.

Induction	Description
General industry induction	All people who will perform work on a Laing O'Rourke project must have completed the relevant general health and safety industry induction.

Induction	Description
Sydney Metro Orientation Training	All persons who will work on this Sydney Metro project will undertake the Sydney Metro orientation training as required pursuant to the Sydney Metro Industry Curriculum.
Site-specific induction	<p>All persons required to undertake work at the workplace will undergo a full induction that covers off on the content of this plan, site-specific rules and procedures and the Next Gear workshop. This induction is intended to ensure that all persons are informed of the arrangements contained within this plan and to provide an opportunity to attendees to clarify any questions they have about the workplace. The induction is not required to use a PowerPoint presentation; however, this in an acceptable method.</p> <p>All personnel, including subcontractors, who receive a site-specific induction and provide a copy of their qualifications and certificates of competency, will be required to provide their individual details (by completing E-T-8-0949 Site Induction Record for Employees and Subcontract workers) and complete the assessment to confirm they understand the induction.</p> <p>Copies of qualifications and certificates of competency will be filed with the induction record and details will be recorded on E-T-8-0907 Certificate Holders Register.</p> <p>Induction details will be included in the general preliminaries issued to all contractors.</p>
Visitor's induction	All visitors will undertake a short visitor induction covering the basic emergency response information. Visitors are not allowed to undertake work at the workplace and must be accompanied by a fully inducted person at all times. Evidence of visitor induction will be captured in the visitor book located in the site office.
Delivery and driver inductions	<p>Ad-hoc deliveries to the site office do not require a driver induction. Driver's required to be unloaded by machinery at the workplace or that are required to drive into a construction or production-related area at the workplace will require a driver induction. The driver induction will cover basic emergency response information, traffic management information and loading and unloading requirements. The driver induction may also cover chain of responsibility requirements for heavy vehicles where applicable. This includes the driver's offside and passengers. Details will be recorded on E-T-8-0949b Site Induction Record for Delivery Drivers.</p> <p>The following protocols apply to deliveries:</p> <ul style="list-style-type: none"> • Mail and parcel deliveries to the site office: Require no further action • One-off deliveries to site: Delivery drivers induction and briefing on the loading/unloading procedure. • Regular deliveries to site: Delivery driver induction or full site-specific induction as determined by PRA or any process delivered by the project to ensure delivery drivers are aware of the hazards and risks and aware of their obligations.

Table 4: Inductions

14. Fitness for work

14.1 Fatigue management

Managers and supervisors must manage the operational and safety risks related to fatigue as stipulated in PS 18 Fitness for Work. Appendix 7 contains a Fatigue Management Plan that the project will apply. This plan includes:

- Fatigue risk assessment
- Method for monitoring hours of work and travel
- Staffing levels
- Workload.

14.2 Alcohol and other drugs

Laing O'Rourke's goal is to establish a framework that ensures, as far as practical, that workers and other people present on any Laing O'Rourke site are protected from exposure to the risks

associated with a person working under the influence of alcohol or other drugs. All workers can be tested for alcohol or other drugs at any time. Types of testing will include random, post-incident, reasonable grounds to suspect impairment, targeted testing and voluntary self-testing.

The acceptable limits for workers and other drugs are:

- For alcohol, a blood alcohol concentration (BAC) of 0.00%. BAC testing will be conducted using a breathalyser that meets the relevant Australian Standard.
- For other drugs, testing may be conducted using urine instant testing. The cut-off concentrations will be those specified in AS 4760 Procedures for Specimen Collection and the Detection and Quantisation of Drugs in Oral Fluid or AS/NZS 4308 Procedures for Specimen Collection and the Detection and Quantification of Drugs of Abuse in Urine, depending on the testing method used.

All testing will be conducted using NATA-certified equipment and testing methods. Calibration records for Laing O'Rourke testing equipment will be maintained at the workplace.

The consequences for a positive test result are set out in PS 18: Fitness for Work.

15. Legal obligations and record management

15.1 Relevant legislation

The principal legislation relevant to this project is the Work Health Safety Act 2011 and Work Health Safety Regulation 2011, as well as applicable codes of practice. The project risk assessment (PRA) will identify other applicable compliance requirements for the project and jurisdiction. Appendix 8 contains a register of all key applicable legislation.

Workers will be notified of the applicable legislative codes and standards and how to access this information at the site induction and by notices displayed throughout the site.

The SMS has reference to applicable legislation and has been developed with the intent of meeting those requirements. Application of the System Requirements and Primary Standards in accordance with their intent should provide assurance that legislative requirements are being met onsite.

15.2 Access to health and safety information

15.2.1 Employees, subcontractors and site workers

The project team will have ready access to current health and safety information via the company intranet, iGATE, and through the open-source website www.nextgearsms.com that hosts the Laing O'Rourke SMS. This information includes:

- System Requirements and Primary Standards
- Health and safety Acts
- Regulations
- Australian standards
- Codes of practice
- Other relevant health and safety documentation.

15.3 Managing health and safety records

15.3.1 Files and records

Project records must be maintained and readily accessible. Refer to SR15 Legal Obligations and Record Management. The Laing O'Rourke Impact database will be the document management system used to record safety incidents, audits and investigations. Soft-copy records of HSE files not relevant to Impact must be maintained on the project server established with the E-T-6-0155 Contract Filing System Structure.

All hard-copy records should be:

- Legible, complete, accurate and contain appropriate signatures and dates where necessary
- Identified, collected, indexed and placed in the relevant subsection of the filing system E-T-6-0155 Contract Filing System Structure.

20.2 Sydney Metro City and Southwest Sydney Yard Access Bridge

Attachment 20.2: Work Health Safety Management Plan

Appendix 1: Organisational chart

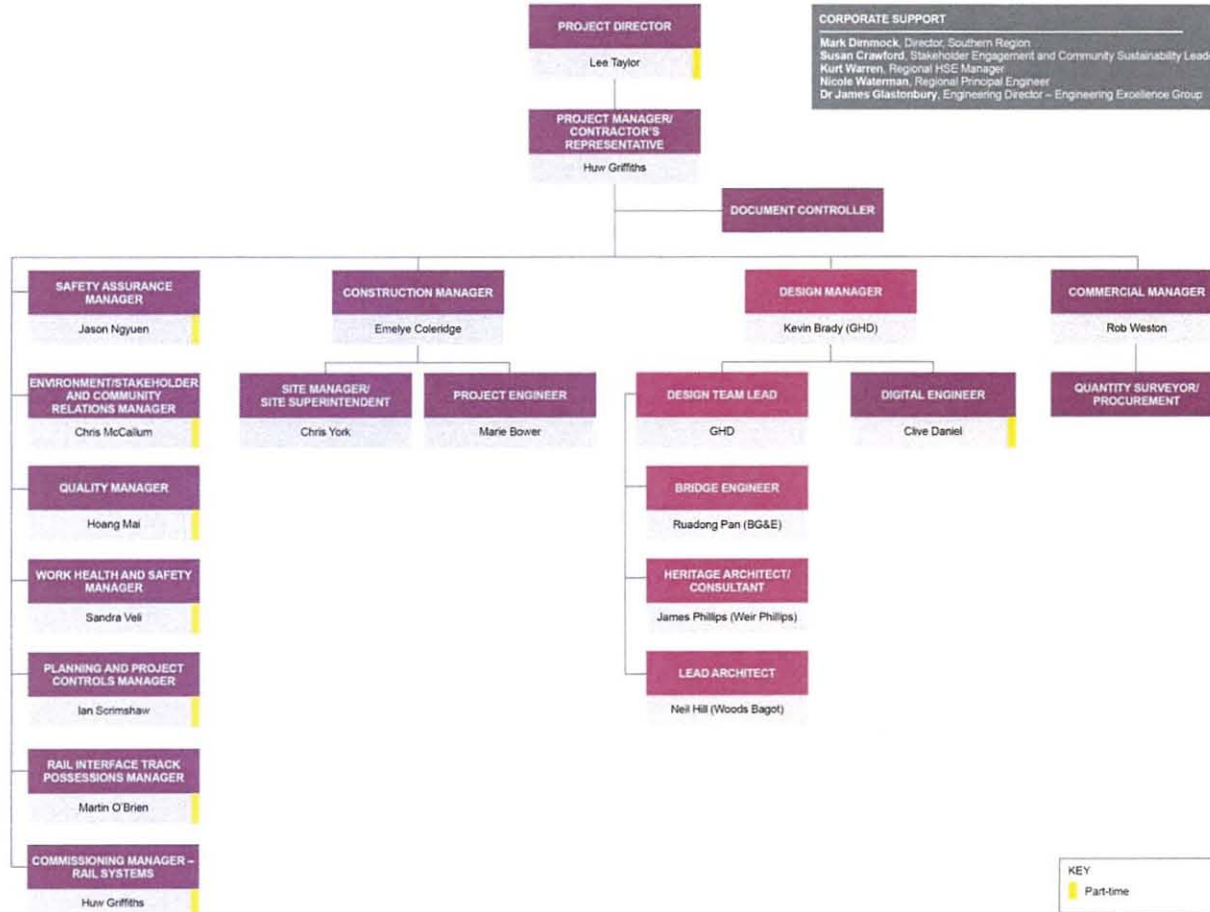


Figure 2: SYAB organisational chart

Appendix 2: Health and safety activity schedule

Following is a sample Laing O'Rourke health and safety activity schedule. A schedule specific to the SYAB project will be developed following contract award.

CHSP H&S Site Activity Schedule

DESCRIPTION	FREQ.	2013			2014											
		Month	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Oct.	Nov.	Dec.
MANAGEMENT PLAN and SYSTEMS																
CHSP Internal Review Process	QUARTERLY															
Project Risk Assessment Review (including effectiveness of H&S&C controls)	QUARTERLY															
Project H&S Audit	QUARTERLY															
Project Launch	MONTHLY															
H&S&C Supply Chain Audit	Prior to works															
Subcontractor Audit- remove as required... add further rows as required.	TBD															
Emergency Response Plan and Preparedness Review	QUARTERLY															
Review monthly Project Leaders Leadership Engagement KPIs	QUARTERLY															
Review T&T and daily prestart compliance table	MONTHLY															
Review weekly inspection and task observation progress	MONTHLY															
Review outstanding Action Items	MONTHLY															
Report CH&S to Client	TBD															
Traffic Management Plan Review	QUARTERLY															
Review KPIs for H&S Goals and Targets	MONTHLY															
Conduct Emergency Response Drill (Specify scenario based on scope of work and risk assessment)	TBD															
Lighting Survey (as required)	QUARTERLY															
Project sign survey	QUARTERLY															
Noise Monitoring and Mapping	QUARTERLY															
Review Alcohol and Drug Program implementation	QUARTERLY															
Review Training Matrix status	QUARTERLY															
Review Induction materials, Registration and Participation	QUARTERLY															
Review First Aid training, First aid & Emergency contact list and posters	QUARTERLY															
EQUIPMENT TESTING AND INSPECTION																
Fire Extinguisher Inspections (test tag current)	MONTHLY															
Electrical Testing and Tagging	QUARTERLY															
Electrical Testing (non-portable fixed RCD push button test)	MONTHLY															
First Aid Kit and Emergency Equipment Inspected and Tested	MONTHLY															
Review Plant and Vehicle Maintenance Schedules	QUARTERLY															
Review Mobile and fixed plant inspection, log books and pre-start	QUARTERLY															
Lifting Equipment Inspection	MONTHLY															
SUBSTANCES & EQUIPMENT																
Review Hazardous Substances and Dangerous Goods storage	QUARTERLY															
MSDS Register and MSDS Review	QUARTERLY															
Waste (haz and oil (storage and disposal) Review	QUARTERLY															
Distribution:																

Figure 3: Sample health and safety activity schedule

Appendix 5: Emergency Response Plan

A sample table of contents from Laing O'Rourke's Emergency Response Plan is provided below. A plan specific to the SYAB project will be developed following contract award.

Contents

1.....	Introduction and scope
1.1.....	Location
1.2.....	Scope of work
1.3.....	Form of contract
1.4.....	Main challenges
1.5.....	Management plans that interface with this Plan
2.....	Purpose of this document
3.....	Laing O'Rourke Commitment
4.....	Legal Requirements
4.1.....	Work Health & Safety Law
4.2.....	Rail Safety National Law
4.3.....	Protection of Environment Operations Act 1997 (POEO Act)
4.4.....	NSW Emergency Management Plan, State Emergency & Rescue Management Act 1989
4.5.....	NSW Counter – Terrorism Plan 2012 & National Counter Terrorism Act 2005
5.....	Incident Management
5.1.....	Manage the Incident
5.2.....	Preserve the Scene
5.3.....	First Response
5.4.....	Classify Immediate Outcome and Potential of the incident
5.5.....	Responding to Actual and Potential Class 1
5.6.....	Class 2 Incident Reporting
5.7.....	Media
5.8.....	Legal Privilege
5.9.....	Senior Management Notification
5.10.....	SIMTA Project Deed Reporting Timeframes
5.11.....	Select Investigation Team
5.12.....	Use the Root, Cause, Analysis method to complete the Investigation
5.13.....	Prioritise and Implement Corrective Actions
5.14.....	Communicate
5.15.....	Investigation Training and Competency Requirements
6.....	Roles and Responsibilities
7.....	Requirements & Expectations
8.....	Key Performance Indicators
9.....	Other internal management objectives

Appendix A: Inventory of Typical Main Pollutants

- Appendix B: Minimum Emergency Equipment**
- Appendix C: Incident and Emergency Response Flow Chart**
- Appendix D: Emergency Contact Numbers**
- Appendix E: Procedure for Notifying Agencies of a Pollution Incident**
- Appendix F: Incident Classification and Reporting**
- Appendix G: Terrorist, Bomb or Substance Threat by Phone, Mail or Suspicious Item Found Guide**
- Appendix H: Armed Offender, Intruder, Witness Guide**
- Appendix I: Immediate Response to Major Spill or Release of Polluted Water Guide**
- Appendix J: Storm Severe Weather Guide**
- Appendix K: Fire Guide**
- Appendix L: Onsite Vehicle Collision Guide**
- Appendix M: Gas Leak Guide**
- Appendix N: Medical Emergency / Injury**
- Appendix O: Electric Shock Guide**
- Appendix P: Deceased Person Guide**
- Appendix Q: Air Supply Contamination Guide**
- Appendix R: Seismic Event Guide**
- Appendix S: Power Failure Guide**
- Appendix T: Lift Failure Guide**
- Appendix U: Surface Explosion Guide**
- Appendix V: Test Tracking Spreadsheet**

Appendix 6: Health and Safety Policy



HEALTH AND SAFETY POLICY.
EFFECTIVE DECEMBER 2015

1

HEALTH AND SAFETY

Health and Safety is a core value at Laing O'Rourke and will not be compromised. We regard safety primarily as an ethical responsibility. We are committed to creating safe working environments and improving long term health and wellbeing to enhanced quality, improve productivity, and generate value assisting in making us the employer of first choice.

This will be achieved by:

- Displaying leadership, passion and commitment at all levels
- Recognising that people, their attitudes and beliefs are central to obtaining excellent Health and Safety performance
- Recognising positive outcomes and admiring and respecting safe behaviours across the organisation
- Having a well-trained and competent workforce who actively contribute and participate in the safe planning of their workplace tasks
- Empowering people to make sound choices about their own safety and the safety of others, by encouraging and supporting them to continually challenge the environment in which they work
- Engaging, supporting and challenging our clients, industry partners and supply chain to raise the standards of safety
- Continually innovating to reduce the potential risks to health and safety
- Using risk resilience, consultation, collaboration, empowerment and leadership at all levels as strong indicators of health and safety performance
- Using consultation, collaboration and leadership as strong indicators of health and safety performance

We also recognise that continual review and improvement is a key component to ensuring our Health and Safety System and standards remain current and effective to ensure compliance with relevant legislation and regulations. In many cases we enhance these requirements to make Laing O'Rourke the company of first choice for all stakeholders, whilst challenging and changing the image of construction worldwide.

The Board of Directors of Laing O'Rourke fully endorses this Policy.

Everyone working for Laing O'Rourke is required to fully support and promote this Policy by complying with the requirements and duties contained in the Safety Management System. We take pride in everyone returning home safely every day.

I personally commit Laing O'Rourke to this Policy.

A handwritten signature in black ink, appearing to be 'Ray O'Rourke', written over a horizontal line.

Ray O'Rourke
Chairman and Chief Executive

Appendix 7: Fatigue Management Plan

A sample table of contents from Laing O'Rourke's Fatigue Management Plan is provided below. A plan specific to the SYAB project will be developed following contract award.

Contents

1.....	Introduction
1.1.....	Objectives
2.....	Responsibilities
3.....	Symptoms and causes of fatigue
4.....	Procedures
4.1.....	Management requirements
4.2.....	Hours of work
4.3.....	Irregular work and workers on call
4.3.1	Overtime
4.3.2	Night shift
4.3.3	Commuting
4.3.4	Engagement of casual/contractor workers
4.4.....	Incident investigations
4.5.....	Identifying fatigue risk sources
4.6.....	Assessing the level of risk
4.7.....	Implementing control measures
5.....	Nutrition and lifestyle
6.....	Evaluation of risk treatments

Appendix 8: Register of applicable legislation

The SYAB project will be conducted in accordance with all relevant state legislation, including legislation that is:

- Listed in the table below
- Identified in the project risk assessment.

State/region	Principal legislation	Authority	Internet address
NSW	<i>Work Health and Safety Act 2011</i> <i>Work Health and Safety Regulations 2011</i>	Safe Work NSW	www.safework.nsw.gov.au
National	<i>Rail Safety National Law No82a (RSNL)</i> <i>RSNL Regulations</i>	ONRSR	www.onrsr.com.au
National	<i>Heavy Vehicle National Law (NSW) 2013 (HVNL)</i> <i>HVNL Regulations</i>	Roads and Maritime Services, NSWPFNSW Police	www.rms.nsw.gov.au www.police.nsw.gov.au

Table 5: Applicable legislation

Appendix 9: Training needs analysis

Job descriptions identify the skills and knowledge requirements for the position titles associated with this project. This matrix is to be compiled, reviewed and maintained by the Project Manager to identify any additional training needs for specific position titles that maybe required or apparent following the compilation of the PRA. The matrix is to be reviewed and updated as necessary by the Project Manager as part of the overall WHSMP review process in consultation with the project team. No changes can be made to the foundation training requirements on this matrix. Refer to the Laing O'Rourke Training and Competency Matrix for the specific competencies mapped to the Supervisor Essential, Safety Essential and SMS Training. These tables will be completed following contract award.

Key:

I = internal training

F = foundation training required for each position and recorded in Success Factors

E = external training

X = training identified by training needs analysis as required for the Project.

Foundation training courses

Safety training	Workers	Contractors Demolition	Project staff	Superintendent	Construction Manager	Project Engineer/ Senior Project	Project Director	Project Manager	Work Health and Safety Manager
Next Gear programme	X	X	X	X	X	X	X	X	X
Sydney Metro Orientation Training	X	X	X		X	X	X	X	X
Inexperienced Demolisher training	X	X							
Experienced demolisher training	X	X							
Demolition Supervisor	X	X							
Civil Construction worker skills	X		X						
Civil Supervisor skills	X	X		X					
Rail Protection Officer skills and supervision	X								
Rail Supervisor	X								
Frequent Heavy Vehicle driver training	X								
OHS industry induction	X	X	X	X	X	X	X	X	X
Incident investigation (facilitate)				X					X
Frontline Supervisor skills programme				X					
Safety Essentials Programme				X					
Due diligence and health and safety legal obligations							X		
Return to work coordinator									X
Auditor									X

Table 6: Foundation training courses

Attachment 3 – Initial Workforce Development and Industry Participation Plan

Sydney Metro City and Southwest Sydney Yard Access Bridge Attachment 20.3: Workforce Development and Industry Participation Plan

1. Workforce Development and Industry Participation - Proposed Approach

Laing O'Rourke shares TfNSW's vision of Sydney Metro delivering "A workforce legacy which benefits individuals, communities, the project and the industry, and is delivered through collaboration and partnerships."

The successful delivery of the Sydney Metro City and Southwest project will require the deployment of a talented and committed workforce that also allows for upskilling and development of eligible workers. Laing O'Rourke is committed to creating a collaborative and high performing culture dedicated to developing talent and rewarding success to ensure all of our personnel and subcontractors are performing at optimum levels.

We aspire to support the Sydney Metro team across a number of projects, and will implement consistent workforce development and industry participation policies and processes that meet or exceed TfNSW's expectations across all of the Sydney Metro projects that we are involved with. These overarching policies will be implemented on the Sydney Yard Access Bridge, and we will seek to work closely with the other contractors and organisations involved in delivering the Sydney Metro City and South West project, as well as with TfNSW, to ensure that an aligned best practice approach is delivered across the project as a whole. We also commit to participating in the meetings and working groups of the Sydney Metro City and Southwest Skills and Employment Advisor Group (SEAG).

Laing O'Rourke is committed to developing not just our own workforce but also the local economy and supporting the upskilling of the industry as a whole. We believe that increased diversity benefits the construction industry and the national economy, and has the potential to transform the lives of people from economically disadvantaged areas. We also believe that actively promoting equality of opportunity for all people, irrespective of race, gender, sexual orientation or religion, is a fundamental moral requirement of organisations in modern Australia.

This development and inclusivity agenda is driven from the top of our organisation, by our Group CEO and owner Ray O'Rourke, and the Australian Hub Managing Director, Cathal O'Rourke.

Laing O'Rourke has been heavily involved in two of the projects referenced as case studies in the Sydney Metro City and Southwest Workforce Development and Industry Participation Strategy. We are delivering six stations on the London Crossrail project and were the Delivery Partner working with the Client on the London 2012 Olympic Games. The workforce development and industry participation approaches developed on these projects have been modified for Australian conditions and implemented on the \$4bn Woolgoolga to Ballina project, where we are the Delivery Partner with Roads and Maritime Services to upgrade the remaining sections of the Pacific Highway in northern NSW. The techniques and lessons learned on these projects will be brought to all our works on the Sydney Metro City and Southwest project.

We will also utilise local industry development and inclusivity experience developed on a wide range of projects in NSW and across Australia, including the Building the Education programme in Western NSW and the \$900m Moorebank Unit Relocation project for the Department of Defence in Western Sydney.

An outline of our approach is provided below and further expanded upon in the remaining sections of the plan.

Resources and lines of responsibility: our proposed Project Director, Lee Taylor, will have the overall responsibility for ensuring that this Workforce Development and Industry Participation Plan is implemented on this project, acting as a link across the other Sydney Metro projects. Day to day responsibility for implementation will be delegated to the Construction Manager, Emelye Coleridge. Lee and Emelye will be supported by Jacqueline Minney, Head of Diversity, Inclusion and Indigenous Affairs, Tony Sawiris, Learning and Development Manager, and by the Laing O'Rourke Diversity Council.

Systems: In addition to our existing training, competency and procurement systems, a specific database will be set up to track training, development and competency across project staff.

Training providers: Laing O'Rourke works with a range of professional training providers across Australia and will identify specific training partners to support the training and development required on the Sydney Metro project. We will also use the Industry Capability Network (ICN) to assist with engagement of the local small to medium sized enterprises (SME) supply chain.

Training: Laing O'Rourke will carry out an extensive training and development programme, in addition to supporting the Sydney Metro Industry Curriculum program. All personnel on the project will have safety, well-being and cultural awareness training. All supervisory and management staff will be provided with leadership and inclusivity training. A wide range of other courses, training material and on line courses will be available for all personnel on the project. Many of these training courses lead to nationally recognised qualifications.

Apprenticeships: Laing O'Rourke employs graduate engineers, trainees and apprentices in accordance with our diversity and sustainability policies. The Sydney Metro project will provide opportunities for trainees, graduates and apprentices to gain valuable experience in the planning and delivery of complex, multi-disciplinary infrastructure projects.

Maximisation of employment opportunities: To support the future growth of the industries in which we work, we are committed to local engagement, professional development and the creation of an enduring positive legacy through education, training and enhanced career opportunities for all our people. This includes targeting, recruiting, developing and supporting school leavers, trade graduates, Aboriginal and Torres Strait Islander peoples and women, through a range of specialised programmes.

Sustainable procurement: Laing O'Rourke will work closely with the ICN and other local organisations to ensure that local SMEs and Certified Aboriginal Businesses have access to employment opportunities on Sydney Metro and the SYAB project. We will support the local industry and Certified Aboriginal Businesses to ensure that the targets for inclusion are met, and will give full, fair and reasonable consideration to local subcontractors to participate in the project.

Subcontractor support: Laing O'Rourke will select from the supply chain based on track record and willingness to work with us to ensure that compliance with the sustainable procurement and training targets. We understand that this can be challenging for smaller businesses so where necessary we will work with and support our supply chain partners to ensure that they can meet the requirements.

Subcontractor performance and compliance: Laing O'Rourke will work closely with our subcontractors to ensure that they are meeting their obligations with regard to workplace development and inclusivity, and will proactively work with them to ensure that targets are met.

Targets: Laing O'Rourke will commit to delivering the workplace development and industry participation targets contained in SMR W – as a minimum. The completed TfNSW templates are attached to this plan.

2. Workforce development

Across Sydney Metro City and Southwest projects we will develop a Project Training Management Plan (PTMP) which will outline the projects strategic framework for training and development, our management approach and the processes employed through the life of the project. The plan will also ensure compliance with the NSW Government Training and Management Guidelines 2009 for a Category 1 Project.

Laing O'Rourke will ALSO publish a formal, project-specific Learning and Development Policy detailing our commitment to training and outlining the following training objectives:

- Ensuring that all employees understand that the project is committed to providing learning and development opportunities that meet business and individual career development needs. Employees must also take responsibility for their own development and make the most out of opportunities offered
- Committing to our participation targets as identified in the Project Training Management Plan (PTMP), including:
 - Workers that identify as an Aboriginal or Torres Strait Islander
 - Workers employed as a trainee or apprentice
- Regularly assessing the performance and development needs of our employees to ensure they possess the appropriate skills and competencies to enable them to meet the needs of project, as outlined in the management plans
- Understanding how employers (project contractors) will contribute to the overall training and development goals of the project.

Laing O'Rourke also commits to participation in the meetings and working groups of the Sydney Metro City and Southwest Skills and Employment Advisor Group (SEAG).

3. Systems

Laing O'Rourke has a number of systems in place for managing workforce development, competency compliance and industry participation.

- (i) Laing O'Rourke holds licenses for the Onsite Track Easy Rail Industry Worker (RIW) systems hosted by Pegasus and endorsed by the Australian Rail Association as well as all Rail Infrastructure Managers (RIMs). The use of the RIW system to ensure workers performing Rail Safety Work (RSW) as defined, will ensure compliance to regulatory requirements pursuant to the National Rail Safety Law and will assist with the upskilling of workers requiring extra training, qualifications or experience to enable them to perform their roles.
- (ii) *Success Factors* is an in-house system used to manage all aspects of Laing O'Rourke employees' career development, including a performance management system that enables us to identify additional training and development needs, which are then documented in an individual's Personal Development Plan in collaboration with their line manager. An extensive on line learning and development library of training materials are available to all employees, hosted in the *Success Factors* system.

- (iii) For all other non-RSW Laing O'Rourke can utilise its competency management database hosted by EIFY Pty Ltd. The system allows us to record, manage and report on competency levels held by Laing O'Rourke and subcontract workers that are not performing RSW. The system also enables us to capture demographic information such as workers identifying as Aboriginal or Torres Strait Islander or workers employed as an apprentice or trainee.
- (iv) We hold a database of prequalified subcontractors and suppliers with many SMEs local to the Sydney Metro projects.

4. Specialist providers

Laing O'Rourke works with numerous reputable and specialist providers across Australia to meet our training and development needs, including:

- Centre for Excellence in Rail Training (CERT)
- Metro (Victoria)
- St Johns Ambulance
- TAFE NSW
- Thermit (welding certification – specialist rail).

Laing O'Rourke will source additional suitable local training providers as required, for instance when specialist training or verification of competency is required. These providers may cover a range of areas including plant operation, crane lifting techniques, manual handling a stretching programs, health initiatives, frontline leadership, mentoring/coaching, specialist technical requirements and the like.

We also make extensive use of the services of the ICN to assist with engagement of the local SME supply chain. We have worked closely with the ICN to engage with local SMEs across all our major projects, from local Sydney projects to major regional programmes of works.

5. Accredited training

Laing O'Rourke provides opportunities to personnel through accredited and non-accredited training programs. In addition to traditional apprenticeships and traineeships, our personnel have previously participated in the following nationally-recognised programs:

- Certificates III and IV in related business, management, work health and safety, human resources, administration and finance
- Certificate IV in Leadership and Management (Laing O'Rourke Supervisor Essentials program).

All subcontractors will be required to outline their plans in relation to nationally-recognised and accredited training offered to their employees within their respective PTPs, and to comply with the overall training requirements of the contract and the Sydney Metro City and Southwest project targets.

6. Traineeships and apprenticeships

Laing O'Rourke employs graduate engineers, trainees and apprentices in accordance with our diversity and sustainability policies. The Sydney Metro project will provide opportunities for trainees, graduates and apprentices to gain experience in the planning and delivery of complex, multi-disciplinary infrastructure projects.

In particular on the SYAB project there will be opportunity in areas such as:

- (a) Electrical distribution and rail traction
- (b) Engineering-construction and civil
- (c) Rail Infrastructure work
- (d) Health and Safety
- (e) Environment

We will meet or exceed the Sydney Metro and NSW Government targets for traineeships and apprenticeships on the project and we will ensure that all subcontractors meet with requirements. Where necessary we will work with the subcontractors to ensure that suitable training is in place.

7. Diversity and inclusion in employment opportunities

As part of Laing O'Rourke's commitment and practical implementation of Social Sustainability and Social Procurement Practices, we recognise that the construction industry is uniquely placed to offer employment, training and business development opportunities to indigenous communities and persons from diverse backgrounds including long term unemployed and females.

The establishment of enduring, cooperative partnerships is a positive step for Laing O'Rourke in terms of our corporate reputation and our ability to source a trained workforce locally. The partnerships we develop complement broader Government policies and programs aimed at supporting the aspirations of indigenous communities to build community capacity and develop commercial enterprises.

To support the future growth of the industries in which we work, Laing O'Rourke is committed to local engagement, professional development and the creation of an enduring positive legacy through education, training and enhanced career opportunities for all our people. This includes targeting, recruiting, developing and supporting school leavers, trade graduates, Aboriginal and Torres Strait Islander peoples and women, through a range of specialised programmes. These include school visits specifically targeted at increasing diversity in the engineering and construction workforce, for this project and for other projects in the years to come. We recognise that careers in the construction industry often start with education, and that we need to ensure female and minority participation in aligned tertiary education is developed and encouraged.

Laing O'Rourke has a strong recent history in supporting Aboriginal and Torres Strait Islander participation in construction. We were the first contractor to have an approved Reconciliation Action Plan, and we have run recruitment and training schemes targeted specifically at providing opportunities for Aboriginal and Torres Strait Islander people in our business.

When engaging contractors, Laing O'Rourke will provide specific requirements regarding subcontractor compliance with this plan. Part of the selection criteria adopted for the project includes:

- Contractor history with regard to training and diversity
- Contractor willingness to achieve the participation targets identified in the NSW Government Training Management Guidelines 2009
- Compliance with the NSW Aboriginal Participation in Construction Policy (May 2015)
- Contractor provision of employee development opportunities.

Our Commercial Manager will ensure procurement procedures for the larger subcontractor packages, including a requirement for the contractor to use their best endeavours to maximise employment opportunities for Aboriginal and Torres Strait Islander peoples and local workforce. These elements will be in accordance with the Indigenous Participation Plan and the Local Workforce Employment Strategy.

Subcontractor involvement will also include reporting requirements pertinent to the Aboriginal Participation in Construction (APIC) Guidelines.

All job vacancies will also be posted on the Sydney Metro website jobs portal.

8. Sustainable procurement

Laing O'Rourke will advertise all procurement opportunities through the ICN Gateway (<http://www.icn.org.au>) and will approach and support Indigenous businesses in line with our Reconciliation Action Plan (RAP). We are focussed on creating opportunities for Indigenous businesses through a range of actions that demonstrate our commitment to providing long-term, sustainable employment, training, education and business opportunities for Indigenous people and their communities.

This approach also applies to our small to medium sized enterprises (SMEs). We commit to engage a minimum of five SMEs in the supply chain with a minimum of three of them being local businesses and two of them Certified Aboriginal Businesses. Full, fair and reasonable consideration will be provided to local suppliers and specialist contractors to participate in the project.

We also commit to the requirement for 20% of the workforce to be local, and 20% to be aboriginal. This will be achieved via directly employed Laing O'Rourke personnel as well as subcontractor personnel.

Our Indigenous Procurement Policy objectives recognise current Indigenous hardship in accessing business opportunities. As the Indigenous business sector is dominated by SMEs the policy focuses effort on these enterprises to drive improvements in Indigenous economic development and Indigenous employment. The policy comprises three major components:

- (i) Targeted project spend
- (ii) Mandatory set aside
- (iii) Obligations passed through to non-Indigenous businesses.

For the purposes of the policy an Indigenous business is defined as a business that is at least 50 per cent owned by Indigenous Australians.

Subcontracts and supply agreements with joint ventures, where the Indigenous business has at least 25 per cent equity in the joint venture, also count towards the target.

Laing O'Rourke will ensure that non-Indigenous businesses contribute to the participation of Indigenous people in training, employment and businesses. While acknowledging that value for money is the core principle underpinning procurement decisions, when assessing tenderers Laing O'Rourke may give preference to subcontractors, suppliers and consultants that have a demonstrated commitment to:

- Promoting employment and training opportunities for Indigenous people
- Awarding contracts directly with Indigenous businesses.

Recognising sub-subcontracts in this way is intended to increase the uptake of Indigenous businesses into the supply chain. Sub-subcontracts are a good way for smaller and less-experienced Indigenous businesses to enter Laing O'Rourke's supply chain.

Laing O'Rourke's standard Invitation to Tender (ITT) has been updated to incorporate a returnable schedule requesting that the subcontractor or supplier develop and implement an Indigenous Participation Plan to facilitate employment, training and sub-subcontract and/or supply opportunities for members and businesses of the Indigenous communities. The standard suite of subcontract terms and conditions has also been updated to outline the nominated target and reporting requirements.

9. Subcontractor support

The assessment and evaluation processes for subcontractor procurement will include their current approach, track record and commitment to workforce development, industry participation and inclusiveness.

All subcontractors must comply with NSW Government Training and Management Guidelines 2009 for a Category 1 project in relation to:

- Aboriginal employees
- Local communities
- Traineeship and apprenticeship targets.

The subcontractors will be required to develop and provide Laing O'Rourke with a detailed PTP as part of their tender submission. The PTP must include:

- Details of any training or development specified within any employment instrument/s (e.g. Enterprise Bargaining Agreements, Awards) applicable to the workforce
- A skills/competency matrix demonstrating the roles and related competencies required for each stage of the project and how they will be included on the project
- Detail how they will verify individuals' competencies and ensure only suitably qualified and competent workers will be engaged to work on the project
- Detail how they will achieve and maintain priority participation targets as identified in the NSW Government Training and Management Guidelines 2009.

These requirements will also be outlined in project procurement documents and the project will give preference given to subcontractors who demonstrate a willingness to work with Laing O'Rourke to achieve the project's participation targets and its obligations under the NSW Government Training and Management Guidelines 2009.

Subcontractors ultimately engaged on the project will be provided with a Contractor Mobilisation Guide to support them as they mobilise their workers to site. The guide provides detailed information on the following:

- Project training policy
- Required skills, competencies and license requirements for identified roles on the project
- Instructions for navigating the competency management system employed on the project and managing the information of their workers
- Induction and pre-mobilisation training requirements
- Online project training programs Laing O'Rourke has available to all workers

- NSW Government Training and Management Guidelines 2009 and related reporting requirements
- Key Laing O'Rourke training contacts.

10. Governance

Laing O'Rourke has established governance regimes in place for training and development and reports on project progress as it relates to participation targets. We will intervene if targets are not met. To enable accuracy of reporting, contractors must provide relevant demographic information for all persons brought onto the site. Laing O'Rourke will assess and report on that demographic data to ensure compliance with the NSW Training and Management Guidelines 2009 and the project's Indigenous Participation Plan.

Laing O'Rourke will also regularly audit subcontractor records and their training needs analysis to ensure subcontractor commitments are being fulfilled. The project management team will enforce corrective actions where non-compliance is identified.

Laing O'Rourke warrants it will comply with all completed initial project commencement templates in accordance with the contract within the specified timeframe (generally 60 days) and will submit monthly reports to the project principle for review in accordance with the Sydney Metro reporting template, and containing the information required by SMR W.

11. Workforce development

Laing O'Rourke will analyse the roles required to deliver the project and confirm any training requirements to be fulfilled in the short, medium and long term. This includes identifying the skills already held, as well as those that need to be developed, to meet the project goals and timelines for completion. The analysis will also consider:

- **Short-term goals:** Project induction and right-to-site competencies, such as industry inductions, Rail Industry Worker requirements and verification of competency (VOC) requirements
- **Medium term goals:** Skills required to achieve competency against delivery objectives and when circumstances change
- **Long term goals:** Individual professional development against project delivery objectives.

All Laing O'Rourke personnel participate in formal annual reviews and informal reviews on a more frequent basis, providing constant direction and focus for management.

Contractors must comply with NSW Government Training and Management Guidelines 2009 for a Category 1 project which states:

'Apprentices must be employed to undertake 20% of the trade work involved in the contract. This means there will be an apprentice for every four tradespeople. This target is to be reached by a quarter of the way through the contract awarded and maintained until the project is 90% complete.'

The target covers apprentices and trainees registered under the NSW Apprenticeship and Traineeship Act 2001 and should be calculated on the basis of the total number of tradespersons employed in all trades by the contractor and subcontractors.'

The project participation for the SYAB Project will be developed by using the formula outlined in the NSW Training Management Guidelines 2009, as outlined below:

Project Targets	
Apprentice Target	+ Training Target
(Average No Trades Persons x 0.2)	(Average Workforce x 0.2)
20 x 0.2	60 x 0.2
4	12

Using this calculation, the participation target is 16 employees participating in structured training by a quarter of the way through the contract award. This will be maintained until the project is 90% complete.

12. Sydney Metro Industry Curriculum

Contractors delivering the Sydney Yard Access Bridge will need to comply with the Sydney Metro Industry Curriculum (SMIC) program. Laing O'Rourke recognises the value in this program and supports its goals of improving the skills and competence of industry participants and creating a better qualified workforce.

All personnel on the project will be required to complete the Sydney Metro Orientation Training prior to commencement on site, including subcontractor and supplier personnel.

Laing O'Rourke will ensure that all persons identified within the program meet the competency requirements prior to commencing on site or within the specified timeframes for defined occupations.

This project will involve workers from the following sectors:

- Demolition Workers
- Demolition Supervisors
- Civil Construction Workers
- Civil Construction Supervisors
- Heavy Vehicle Operators
- Rail Supervisors
- Worksite Protection Officers.

Laing O'Rourke will screen subcontractors and assess their current qualifications and liaise with Sydney Metro for recognition of prior learning. Invitations to tender and standard terms and conditions of subcontract will include this information and requirements. Unless exempt, all relevant personnel will be required to complete the appropriate SMIC training courses. This will apply to Laing O'Rourke personnel, as well as supplier and subcontractor personnel.

It is estimated that 250 participants will be assessed or enter into the SMIC program.

Attachment 4 – Initial Safety Assurance Plan

Sydney Metro City and Southwest Sydney Yard Access Bridge Attachment 20.4: Safety Assurance Plan

Document and revision history

Document details	
Title	Safety Assurance Plan
Client	Transport for NSW
Client reference no.	2016/027
Laing O'Rourke contract no.	TBC

Revisions

Revision	Date	Description	Prepared by	Approved by
1	10 November 2016	Initial Issue for tender	Jason Nguyen	Raquel Rubalcaba

Management reviews

Review date	Details	Reviewed by
	List major changes	

Controlled: YES Copy no.: Uncontrolled: NO

Note: This plan is a near-final draft and will be reviewed subject to the advice that Laing O'Rourke is the preferred tenderer.

Terms and definitions

Term	Definition
AEO	Authorised Engineering Organisation
AFC	Approved For Construction
ALARP	as low as reasonably practicable: a level of safety risk that is tolerable and cannot be reduced further without expenditure of costs that are disproportionate to the benefit gained or where the solutions are impractical to implement
CDR	Critical Design Review
IHA	interface hazard analysis
IPR	Independent Professional Reviewer
ITP	inspection and test plan
OSHA	operating and support hazard analysis
PHA	preliminary hazard analysis
PSHL	Project Safety Hazard Log, the register used to record any safety hazard issues and mitigated controls to reduce the hazard to SFAIRP
RAM	reliability, availability and maintainability
RATM	Requirement Allocation Traceability Matrix
SAP	Safety Assurance Plan
SAR	Safety Assurance Report
SDR	System Definition Review
SFAIRP	so far as is reasonably practicable
SHA	System Hazard Analysis
shall	Mandatory, not optional
SiD	Safety in Design
SR	Safety Review
SRS	Systems Requirements Specification
TfNSW	Transport for New South Wales
WHS	work health and safety

Table 2: Terms and definitions

1. Introduction

This Safety Assurance Plan describes Laing O’Rourke’s strategic and methodical approach to managing engineering safety assurance during the delivery of the Sydney Yard Access Bridge (SYAB) project.

2. Purpose of the Safety Assurance Plan

The purpose of this plan is to identify and define the safety assurance approach required to deliver the project in accordance with Transport for NSW’s (TfNSW’s) requirements and all relevant legislation.

This plan has been developed to:

- Explain the management method for executing the project works
- Define responsibilities, resources and processes for planning, performing and verifying that the works meet the requirement of the contract
- Reference and integrate all of the management systems, management plans and supporting management plans required for the execution of the project works and meet the requirements of the project contract
- Comply with the requirements of the project contract
- Ensure that the needs and requirements of TfNSW are met
- Undertake the effective management of safety assurance as an inherent component of the engineering lifecycle
- Undertake effective management of safety assurance throughout the design, construction, testing and commissioning and handover phases.

2.1 Roles and responsibilities

The key personnel and their respective responsibilities for managing safety assurance on the SYAB project are outlined in the following table.

Role	Responsibility
Laing O’Rourke – Independent Professional Reviewer (IPR)	<ul style="list-style-type: none"> • Conduct an independent review of the safety assurance process, activities and documentation of evidence in supporting the Safety Argument • Assess the adequacy of the safety requirements and verify whether safety requirements are being met • Assess the adequacy of safety assurance management, in all stages of the lifecycle of project • Recommend either "acceptance" or "rejection" of the Safety Assurance Case (for example, Safety Risk Summary Report).
Safety Assurance Manager	<ul style="list-style-type: none"> • Undertake safety assurance activities • Support the project team in relation to safety risk; requirement management and verification; reliability, availability and maintainability (RAM) analysis; and human factor matters • Act as the safety assurance interface between Laing O’Rourke and TfNSW • Identify improvements and actions required to achieve compliance with safety legislation • Implement this plan.

Role	Responsibility
Safety Assurance Committee	<p>The Safety Assurance Committee is comprised of the Safety Assurance Manager, TfNSW representatives and Laing O'Rourke project team, who will (as a minimum):</p> <ul style="list-style-type: none"> • Provide a consultative forum to bring together key stakeholders to inform them about the progress of safety assurance • Review safety assurance deliverables: status of RATM, Hazard Log, Human Factors issues, concessions, post-AFC design changes, non-conformance reports and RAM issues • Review and resolve safety assurance issues.

Table 1: Roles and responsibilities

2.2 Review and approvals

This Safety Assurance Plan will be further developed and updated in consultation with TfNSW. Future revisions will be updated to include the version number, date and brief comments on the revisions on the cover of the plan immediately after the update. Updates to this plan will be numbered and issued to holders of controlled copies. Revision may result from:

- Identification of efficiencies and innovations
- Improvements on addressing specification requirements
- Management review
- Audit (either internal or by external parties)
- Changes to current practice.

TfNSW will be advised of implemented changes to the Safety Assurance Plan and revised documents will be submitted within the requested timeframe detailing the changes.

2.3 Audit

Compliance to this plan will be confirmed through regular audit and surveillance as per Laing O'Rourke's audit procedure.

3. Safety requirements

The following safety assurance requirements are applicable to the project:

- Safety assurance activities shall be undertaken in accordance with this plan
- All foreseeable safety hazards associated with the project and its ongoing operation and maintenance have been assessed and managed so far as is reasonably practicable (SFAIRP)
- The identified foreseeable hazards shall be recorded in the Project Safety Hazard Log (PSHL)
- Human factors shall be considered in the safety analysis
- Safety interfaces with local authorities shall be identified and managed
- Safety assurance audits shall be undertaken throughout the implementation of the project
- The design of the asset shall comply with standards and approvals
- The design standards shall be assessed as appropriate for the application and the environment

- Designers shall hold the appropriate level of Authorised Engineering Organisation (AEO) engineering competency
- Commissioning of the asset shall comply with the approved design and standards
- The asset shall be tested and commissioned to prove the required performance is achieved
- The asset shall be integrated into the wider network and its performance proved
- Residual and operational hazards shall be transferred to the end user, Sydney Trains, and accepted
- Safety requirements shall be identified, documented and verified via the use of a Requirement Allocation Traceability Matrix (RATM).

3.1 Systems safety environment

The systems safety environment will be managed through the following activities:

- The project team shall undertake hazard identification workshops to identify and document all foreseeable hazards throughout the project lifecycle
- The workshops shall include aspects of the safe design that have a safety impact on passengers, staff and members of the public during the operation and maintenance of the asset
- All hazards identified from the workshops will be documented in the PSHL and SFAIRP assessed
- A PSHL shall be established at the start of the project
- A preliminary hazard analysis (PHA) shall be considered a first-pass hazard identification and risk assessment. It will identify a list of potential hazards to be controlled during the initial design phase and the extent to which further detailed analysis will be required throughout the project lifecycle. Laing O'Rourke will review the PHA completed by AEO designer (external to Laing O'Rourke) to ensure it is current and applicable to the design. In this context, additional analysis may be arranged to complete the PHA.

3.2 Human Factor analysis

Any human factor identified shall be managed as follow:

- Human factors engineering shall be integrated into the safety assurance process
- Human factors engineering shall be considered as part of Safety in Design (SiD) workshops
- All human factors issues and procedures relating to the RAM aspects of project commissioning shall also be considered (where applicable)
- Any human factors engineering issues identified shall be included in the PSHL and managed in the same manner as safety hazards.

4. Interface stakeholders

Interface stakeholders shall be identified at the start of the project. It is the responsibility of the SYAB Design Manager to identify the relevant internal and external stakeholders. A detailed list of the interface stakeholders and associated management process will be referenced in the Interface Management Plan (to be developed on contract award).

Relevant stakeholders shall be invited to SiD workshops and safety reviews. These stakeholders may include:

-
- Council
 - Neighbouring residents
 - NSW Department of Planning and Environment
 - Roads and Maritime Services
 - Sydney Trains
 - Transport for NSW
 - Utility and service providers.

Interface stakeholders and relevant consultation strategy shall be documented and managed via an Interface Register (refer to the Interface Management Plan).

5. Safety claim

The safety claim for the SYAB shall be that the asset is acceptable to be safely operated and maintained as part of the existing TfNSW rail network.

The project team shall undertake the safety assurance activities described in this plan to support the SYAB safety claim.

A goal structuring notation (GSN) shall be prepared following award project. As such, this Safety Assurance Plan will be reviewed and updated to include the detailed process of safety assurance activities.

6. Assumptions, dependencies and constraints

6.1 Assumptions

For the SYAB project, the following assumptions have been made in the development of this plan:

- All existing safety risks and operational hazards in relation to the network's operations have been adequately assessed and managed, SFAIRP, by the end user, Sydney Trains
- All relevant existing residual risks have been communicated and handed over to the project on commissioning of the design, as specified in Clause 6.2 of the *Work Health and Safety Act 2011*
- The existing systems that interface with the SYAB project – which are not within the agreed scope for the project – do not compromise the safety and reliability of the works for the operation of the project.

6.2 Dependencies

The activities in this plan have been aligned with the project's overall design and submission programme to ensure evidence of safety assurance is presented at key stages:

- Design phase: Preliminary Design Review (PDR), Critical Design Review (CDR) and Approved For Construction (AFC)
- Implementation phase: construction, testing and commissioning
- Handover phase.

6.2.1 Design interfaces

TfNSW has engaged an AEO designer (external to Laing O'Rourke) to complete the System Definition Review (SDR) stage, based on the information document 01.28 CCR13100, CCR Gate 2 SYAB 20160829.

Laing O'Rourke shall prepare a Safety Assurance Case (for example, Safety Assurance Report) for TfNSW CCB Gate 3 submission.

Laing O'Rourke will proceed with the design to TfNSW CCB Gate 3 and undertake the following:

- Laing O'Rourke shall prepare inspection and test plans (ITPs) for the work packages and submit them to the relevant design discipline leads for endorsement of completeness of engineering controls for verifications.
- During construction, testing and commissioning, the construction teams shall be responsible for generating requests for information on the basis of a considered and justifiable lack of sufficient information to proceed successfully with construction, testing and commissioning activity. In such cases, where "major" changes are applied to the approved design (for example, Approval of TfNSW Configuration Control Board [CCB] Gate 3), Laing O'Rourke shall review and resubmit the works as follows (at a minimum):
 - Revised safety assurance case (for example, SAR)
 - Revised RAM analysis (where applicable)
 - Revised RATM (where applicable)
 - Revised PSHL
 - Resubmission of CCB Gate 3 (for AFC redesign)
 - Revised ITPs.

7. Safety assurance approach

7.1 Safety risks assessment

SiD workshops shall be undertaken throughout the design phase, allowing the designers, constructors, Sydney Trains and relevant stakeholders to come together to identify hazards and safety risks inherent in the proposed design. These hazards and risks can then be designed out, controlled or mitigated.

During SiD workshops, considerations of the construction hazard assessment implication review will be addressed.

SiD workshops shall be facilitated by Safety Assurance Manager (or nominated person), and all hazards and human factors issues shall be documented in a PSHL as required.

7.2 Project hazard log

A PSHL is a register for documenting hazards and tracking progress in the implementation of the hazards controls. It will be updated regularly throughout the design, construction and commissioning phases of the project.

7.3 Preliminary hazard analysis

The PHA was carried out by the AEO designer (external to Laing O'Rourke) following the establishment of the design concept. As such, the concept design shall be defined in sufficient detail to permit an assessment of potential hazards. In this context, Laing O'Rourke will

undertake due diligence review of the supplied PHA and arrange safety workshops to finalise the PHA before progressing to detailed design.

7.4 Detailed hazard analysis

A detailed hazard and risk analysis will be carried out in conjunction with the project design. The hazards analyses will be considered, as follows:

- System hazard analysis (SHA), including interface hazard analysis (IHA)
- Operating and support hazard analysis (OSHA), including human factors issues and errors review.

A combined analysis of the SHA, IHA and OSHA may be undertaken via SiD workshops, where applicable.

The project's Safety Assurance Manager shall be informed of any hazard raised by designers, the construction team or stakeholders independently of the hazard analyses described above. Notification of these hazards shall be via Laing O'Rourke's ASITE correspondence and shall be inputted to the PSHL, where appropriate.

7.5 Safety requirements development, verification and validation

The safety requirements of the SYAB's design will be elicited via SiD workshops and a detailed hazard analysis. These requirements will be captured in the PSHL and managed in accordance with the Requirements Management Plan, to be developed following contract award.

The verification and validation of the derived safety requirements will be conducted through the provision of suitable evidence during the project lifecycle.

Verification and validation evidence may take the form of design drawings, reports, calculations, analysis or reference to suitable delivery documentation, such as inspection and test checklists, installation and construction drawings and ITPs.

Progressive verification and validation will be demonstrated through the RATM. This shall show that the project safety requirements have been elicited, verified and validated, through reference to suitable information and documentation.

7.6 Reliability, availability and maintainability

At the time of preparing this Safety Assurance Plan, RAM analysis is not applicable to this project, as there are no plans to introduce new novel systems (equipment). However, a RAM plan shall be developed for RAM assessment to determine whether RAM is applicable for sub-systems.

7.7 Configuration management

Acceptance of the designed, constructed and installed works supporting the commissioning of new transport assets shall be undertaken in accordance with the Configuration Management Plan, to be prepared following contract award.

Any changes to the engineered systems shall also follow the Configuration Management Plan.

All concessions and type approval products shall be assessed and approved by the Asset Standards Authority.

7.8 Interfaces

The project's Design Manager shall identify any internal and external interfaces associated with the project.

Internal and external interfaces shall be considered, including:

- Interfaces between the design and external systems
- Interfaces issues and transfer of relevant parties, including construction and commissioning
- Other organisations, including adjoining facilities, services providers and Sydney Trains.

7.9 Safety review

Safety reviews for main work packages shall be undertaken during the detailed design, construction and commissioning phases to ensure that any changes in the design are reviewed and any safety implications as a result of the design change are identified and managed. The reviews will also be used to identify additional mitigation measures (engineering and/or operational), with the objective of reducing risks SFAIRP/ALARP.

The Safety Assurance Manager, or nominated person, will chair the safety reviews. Other attendees may include the Project Manager, the Construction Manager, relevant design discipline leads and other members of the project team as required. Relevant subject matter experts may also be invited to attend.

During a review of the safety requirements, consideration will be given to any design changes that have been introduced. This is to ensure that they are correct and acceptable and that recommended design modifications do not introduce new hazards or increase the risk from existing hazards.

8. Fire safety engineering

Fire and life safety engineering shall seek to satisfy the “deemed to comply” provisions of Building Code of Australia. Where this is not possible a full fire engineered solution will be developed.

9. Decommissioning and disposal

The Concept and Detailed Design Reports must contain a decommissioning review, including a decommissioning methodology and staging report which set out any restrictions on the asset’s capability to be modified, decommissioned, dismantled, demolished and/or disposed of.

10. Independent Professional Reviewer

All SASs/SARs shall be reviewed and approved by Laing O’Rourke’s Independent Professional Reviewer (IPR).

The IPR shall undertake the independent safety verification and validation exercises to ensure that, as a minimum:

- The safety assurance and safety risk management processes have been properly followed
- The safety engineering assurance activities have been undertaken correctly
- The project is meeting the overall safety requirements, including specified requirements for a particular task, process or system
- The risk programme has been managed so that the application of SFAIRP/ALARP shall be met.

11. Safety assurance deliverables

The detailed designs for the SYAB will be validated on the basis of progressive review phases, namely PDR and CDR. The project's Design Management Plan (to be developed on contract award) will contain details of the progressive, staged submissions.

Safety Assurance Statements and Safety Assurance Reports shall be prepared in accordance with the project's staging strategy and comply with TfNSW CCB Gate requirements.

Attachment 5 – Methodologies

The methodologies identified in Table 1 below must be implemented during the performance of the Contractor's Activities and must be addressed, in addition to any other obligations set out in the Contract, in the preparation of the relevant Management Plans required by the Contract, including the SMRs.

Table 1 - Methodologies

Item	Methodology
1)	A "Temporary Works Coordinator" must be appointed to be responsible for the identification of all Temporary Works required for the Contractor's Activities, the implementation of a Temporary Works control register, management of the Temporary Works "Safety in Design" processes and detailed Temporary Works design, hold point and inspection criteria.
2)	For the demolition of the property in Worksite A, implement a demolition plan compliant with AS2061 and engage a demolition specialist to conduct the demolition works.
3)	Load out all waste from Worksite A property demolition through the rear of the properties into Worksite B, not via Regent Street.
4)	Monitoring devices must be installed at sensitive receivers and used to monitor dust, noise and vibration throughout the performance of demolition works.
5)	All temporary level crossings of Tracks must include a layer of geotextile fabric to protect the rail, clips, fasteners and associated infrastructure with ballast placed on top of this protective layer.
6)	Immediately following the completion of use of a temporary level crossing the Contractor must remove all ballast and protective layer prior to handback and must engage a 52/53 track assessor to certify the Track for safe operation.
7)	Traffic control crews must be used at Eddy Avenue and the STA Bus Terminus to facilitate safe delivery of materials and plant.
8)	The construction of the SYAB must use a luffing tower crane and the Contractor must obtain and comply with all Approvals and permissions required for the use of the tower crane.
9)	The tower crane must be locked in position when not in use.
10)	Control systems must be installed and used to ensure the tower crane does not over-sail any land or property for which approval to over-sail has not been obtained.
11)	Any road and footpath works that encroach on Regent Street during night-time lane closures must be undertaken in consultation with the Transport Management Centre.

Item	Methodology
12)	The Construction Traffic Management Plan (as required by SM ES-ST-204 Sydney Metro Construction Environmental Management Framework) must be developed in consultation with, amongst others, RMS, the Transport Management Centre and City of Sydney Council
13)	Precast units must be employed for the pier construction, with Piers 1 and 2 and Abutment B comprising permanent precast cells.
14)	An emergency response plan must be developed in consultation with Sydney Trains, RMS, local police, ambulance and fire brigade services and any other key stakeholders identified by the Principal or the Contractor and must be finalised prior to the commencement of construction activities.
15)	A Possession Management Plan, incorporating Sydney Trains' T-minus planning meetings and a "Race card process" for possession planning and management must be developed and implemented throughout the Contractor's Activities.
16)	An "Interface Management Plan", including a process for regular interface meetings with all Interface Contractors, must be developed and implemented throughout the Contractor's Activities.
17)	The full site perimeter must be secure with solid site boundary hoardings and / or secure fencing. Where temporary fencing is installed to form continuous full perimeter fencing, it must consist of Australian Temporary Fencing (ATF) panels or similar, securely braced over and above the manufacturer's recommendations using extra bracing bays and long runs supported with precast concrete barriers.
18)	Hydraulic shears must be used for demolition works, in lieu of hammers and rock breakers, where ever feasible. Dampened rock breakers may be used for demolition works where it is not feasible to use hydraulic shears.
19)	A "Stakeholder Engagement Calendar" which overlays the construction program and identifies all stakeholder communication key delivery points, including client preparation, approval, production, distribution and community notification timeframes, must be developed and implemented throughout the Contractor's Activities.

PART E – LAND, PROPERTY AND THIRD PARTY REQUIREMENTS