Central Station Main Works Project
Construction Spoil Management Plan

Sydney Metro City and Southwest, Central Station Main Works Project

Construction Spoil Management Plan

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Project name	Central Station Main Works
Client	Sydney Metro City & Southwest – Sydney Metro)
Client contract number	CSMW
Laing O'Rourke contract number	K51

Revision history

Rev	Date	Description	Reviewed	INT/Date	Authorised
1	14/04/2018	Initial Content Development	CD		DC
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8	August 2022	Annual Review	BR		BR
9	April 2023	Annual Review	BR		BR

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Terms and definitions

The following terms, abbreviations and definitions are used in this plan.

Terms	Explanation
Assurance Application	Laing O'Rourke's Online Tool to manage Non-Conformances
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CoA	Conditions of Approval
CSSI	Critical State Significance Infrastructure
CSMW	Central Station Main Works
CSMP	Construction Spoil Management Plan
CSWMP	Construction Soil and Water Management Plan
CTMP	Construction Traffic Management Plan
CWMP	Construction Waste Management Plan
DPE	Department of Planning & Environment
ECM	Environmental Control Map
EIS	Environmental Impact Statement (Sydney Metro City and Southwest Chatswood to Sydenham) Determined on 09 January 2017 under the EP&A Act)
ENM	Excavated Natural Material
EPL	Environment Protection Licence
ER	Environmental Representative
ISO	International Standardization Organisation
Laing O'Rourke	Laing O'Rourke Australia Construction Pty Limited
Minister	NSW Minister for Planning
MOD 2	Modification 2 – Central Walk Environmental Impact Statement (Sydney Metro City and Southwest Chatswood to Sydenham determined 21 December 2017) under the EP&A Act to modify SSI15_7400.
MSDR	Monthly Sustainability Data Report
PEM	Project Environmental Manager
REMM	Revised Environmental Mitigation Measures
SCC	Specific contaminant concentration
SM	Sydney Metro
TCLP	Toxicity characteristics leaching procedure
VENM	Virgin Excavated Natural Material

1. Introduction

1.1 Purpose

This Construction Spoil Management Plan (CSMP) outlines the Central Station Main Works (CSMW) Project's (the Project) approach to managing spoil in accordance with Laing O'Rourke Construction Pty Limited's (Laing O'Rourke) legal, planning and contractual requirements and environmental management system. This CSMP has been developed in compliance with Sydney Metro's requirements, Laing O'Rourke's environmental management system and the Minister's Conditions of Approval (CoA). The Plan incorporates the requirements of the Spoil Management Plan (as detailed in the Construction Environmental Management Framework).

1.2 Background

Sydney Metro City & Southwest – Chatswood to Sydenham Project 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. The Project forms part of the Sydney Metro City & Southwest – Chatswood to Sydenham Project and includes the construction of new underground platforms at Central Station and new related pedestrian access ways. The works will be undertaken by Laing O'Rourke. The Project consists of the Metro Station Works, the Central Station Works and the Central Walk Works which are described in the sections below.

1.3 Planning Approval

The Project has been assessed by the Department of Planning Industry and Environment under Section 115ZB of the *Environmental Planning and Assessment Act 1979* (EP&A Act) as Critical State Significant Infrastructure (CSSI). The Project, its impacts, consultation and mitigation were documented in the following suite of documents:

- Critical State Significant Infrastructure Application SSI 15_7400
- Sydney Metro – Chatswood to Sydenham –Environmental Impact Statement (Jacobs/Aracadis/RPS, 2016)
- Sydney Metro – Chatswood to Sydenham –Response to Submissions and Preferred Infrastructure Report (Jacobs/Aracadis/RPS 2016); and

The Planning Assessment Commission granted Approval for the Project on 9 January 2017 and the Laing O'Rourke scope of works is subject to the Minister's Conditions of Approval.

Following approval of the Sydney Metro City and Southwest – Chatswood to Sydenham Project, a modification (SSI Mod 2: Central Walk) was assessed by the Department of Planning Industry and Environment and subsequently approved on 21 December 2017 under section 115ZI of the EP&A Act.

The consolidated Conditions of Approval's for the Sydney Metro City and Southwest have been defined from the following approval modification documents.

- CSSI 7400 MOD 1 – Victoria Cross and Artarmon Substation (determined 18 October 2017)
- CSSI 7400 MOD 4 – Sydenham Station and Metro Facility South (determined 13 December 2017)
- CSSI 7400 MOD 2 – Central Walk (determined 21 December 2017)

- CSSI 7400 MOD 3 – Martin Place Metro Station (determined 22 March 2018)
- CSSI 7400 MOD 5 - Blues Point Acoustic Shed (determined 2 November 2018).
- CSSI 7400 MOD 6 - Administrative Changes (determined 21 February 2019).
- CSSI 7400 MOD 7 - Administrative Changes (determined 24 June 2020).
- CSSI 7400 MOD 8 – Blues Point Access Site (determined 25 November 2020).
- CSSI 7400 MOD 9 – Extension to standard construction hours (determined 30 June 2022)

1.4 Overview of the Project

The Metro Station Works include the installation of new platforms that will be constructed using sophisticated excavation techniques to create a cavern with an island platform, beneath Central Station's existing heavy-rail platforms 12, 13, 14 and 15.

The Central Station Works include new infrastructure and the adjustments to existing infrastructure at Central Station to construct, operate and maintain the Metro Station Works. The key features of the Central Station Works include:

- a new north-south concourse for Central Station which will link the new metro station with the existing northern entrance and north concourse, a new concourse entitled 'Central Walk', and the existing southern baggage tunnel; and
- adjustments to the existing Paid Intercity Concourse, Olympic Tunnel, north concourse and northern entrance to Central Station.

The Central Walk Works include the provision of other infrastructure to provide improved connectivity and other operational enhancements throughout Central Station. The key features of the Central Walk Works include:

- a new eastern entrance for Central Station
- a new east concourse for Central Station beneath existing platforms 16 to 23 (the 'Central Walk'), which will link the new eastern entrance, the new north south concourse, existing platforms 16 to 23 and the existing Eastern Suburbs Railway (ESR) concourse; and
- provisions to enable the future construction (by others) of an extension of the Central Walk through a new west concourse and a new western entrance for Central Station.

1.5 Project Scope of Works

1.5.1 Permanent Works

The permanent new infrastructure to be constructed includes:

- Shortening of platforms 9 to 14 at the northern end, and a corresponding lengthening at the southern end
- Demolition of platforms 13 to 15 and re-instatement of platforms 13 to 14 to accommodate the construction of the new metro station
- Reinforcement of Platform 12 and demolition of exiting canopies of Platform 12
- Minor existing canopy modifications for Platform 14 for lift risers
- Suburban platforms refreshing

- Station excavation requiring the removal of approximately 230,000 cubic metres of spoil
- Demolition of the 'Bounce Hostel'
- Construction of the new eastern pedestrian portal, the eastern concourse and related station access arrangements to existing platforms.
- Construction of power supply from Belmore Park substation to the CSM site; and
- Construction of a padmount substation in Sydney Yard and associated feeders to Lee Street Substation. This will include temporary feeders from Chalmers Street and Sydney Yard West substations and a permanent feeder from Lee Street Substation.

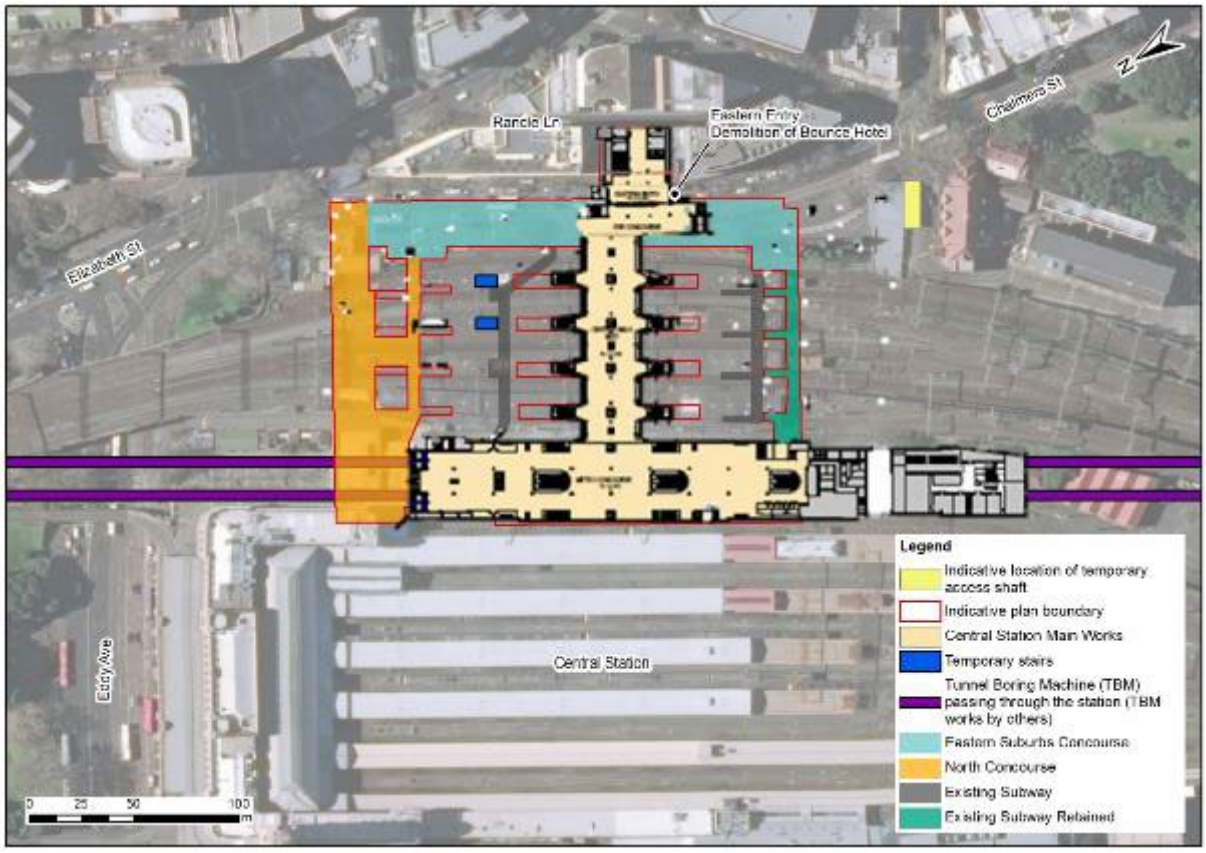

Figure 1.1 Work areas of CSM

1.5.2 Ancillary works

Ancillary works include fencing, maintenance access, utilities works, drainage, noise barriers, road and transport network works and temporary site office within Sydney Yard, laydown and work sites to support construction.

1.5.3 Combined Services Route CSM

The CSR for Central Station will provide for Communications (Comms) services (voice, data and IT connectivity, requiring 6 to 8 cables) and High Voltage electrical (HV) services that will service the whole site, both existing and the new infrastructure installations that are being introduced as part of the Central Station Main Works. It will extend as a circular route around the site, utilising existing service infrastructure where this is available and providing new installations as required to complete the system.

The CSR was included in the Environmental Impact Statement that was approved under SSI 15_7400 as part of the concept design (refer EIS Chapter 7, Project Description – Construction,

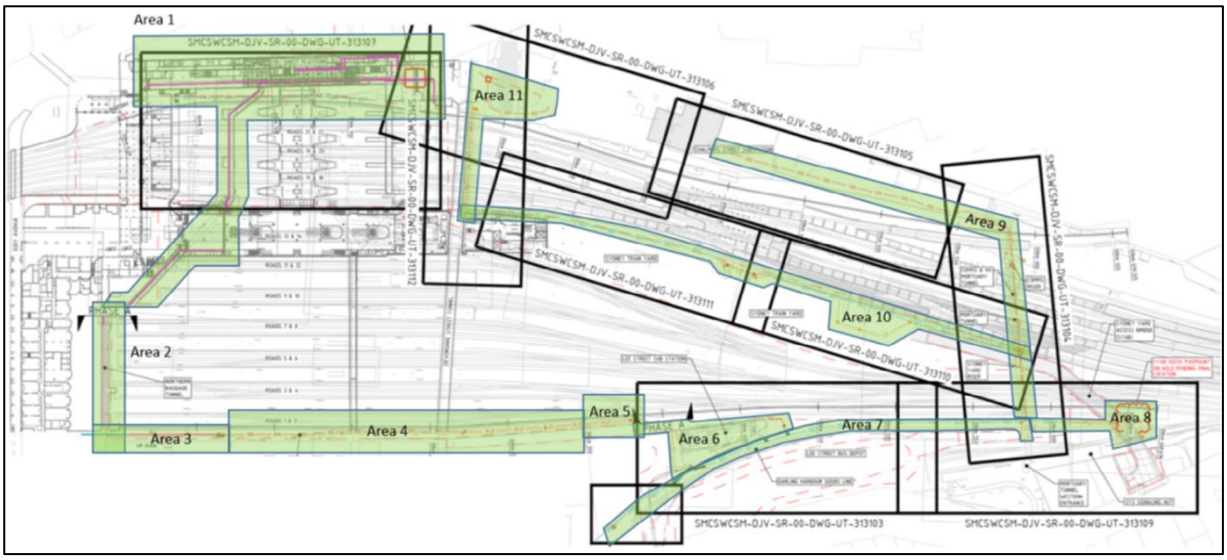

Figure 1.2 The CSR around Central Station

Part 7.10.9, p231) and has progressed through a detailed design process (see figure 1.2). The CSR will be delivered in two phases. Phase A occurs in areas, 2, 3 and 4 and is restricted to the Western Baggage Tunnel, Northern Baggage Tunnel and Platform 1. Phase B occurs in all other Areas and extends to the Darling Harbour Goods Line, Mortuary Tunnel, Sydney Yard, Water Mains tunnel, Prince Alfred Substation, Railway Institute driveway and Sydney Network Base.

1.5.4 Hours of Haulage operation

The haulage and delivery of spoil and material transport activities are permitted to be undertaken 24 hours per day, seven days a week.

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1.6 Works Location and Site Layout

The Project site layout is highlighted below in Figure 1.3

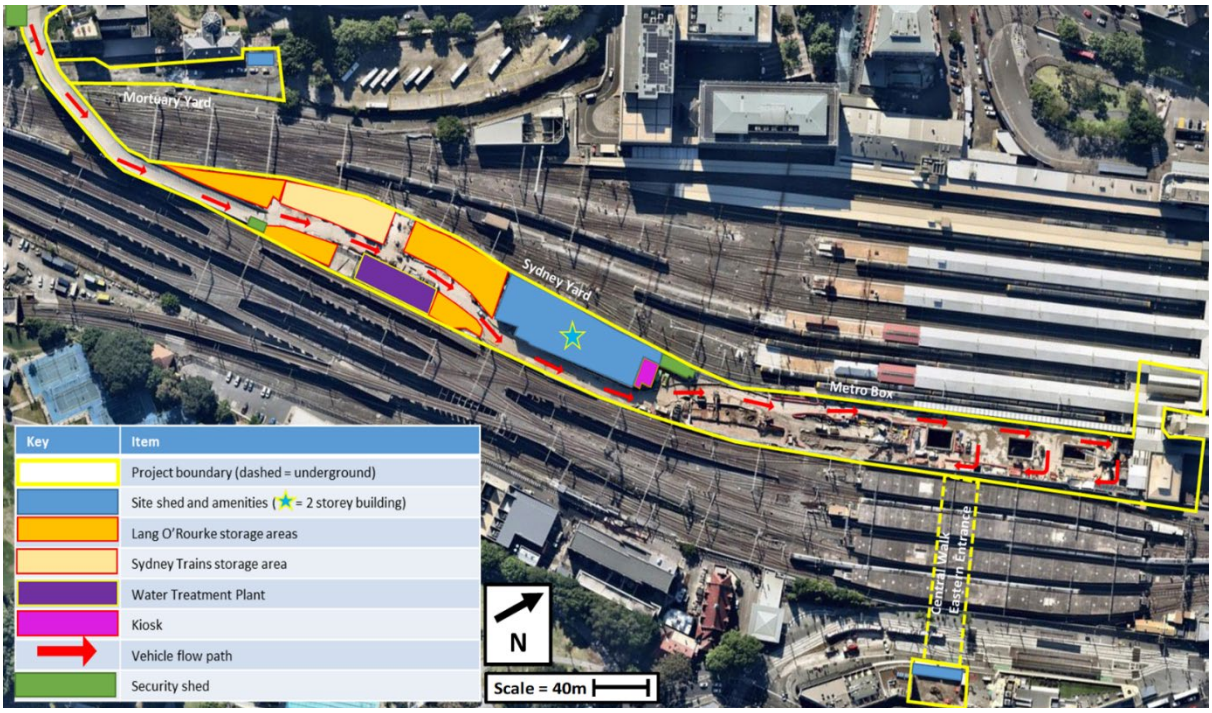

Figure 1.3: CSM Site layout.

1.7 Objectives and Targets

The objectives of the CSMP are as follows:

- Minimise spoil generation where possible
- Mandate the 100% reuse or recycling (on or off-site) of usable spoil
- Manage with consideration to minimising adverse traffic and transport related issues
- Manage with consideration of the impacts on residents and other sensitive receivers
- Manage to avoid the contamination of land and water; and
- Site contamination will be managed effectively to limit the potential risk to human health and the environment.

These objectives conform to Sydney Metro' objectives as described in the Construction Environmental Management Framework.

This plan addresses and details the following issues:

- Excavation, handling, haulage, disposal and reuse methodology, including on-site storage and stockpiling arrangements
- Processes and procedures that will be used for the management of spoil, including those for Virgin Excavated Natural Material (VENM), Excavated Natural Material (ENM), contaminated and unsuitable material
- Measures that will be implemented to both reduce spoil quantities and maximise the beneficial reuse of spoil that will be generated during the performance of the works

- Nominated quantities for reuse of spoil within the construction site, for beneficial reuse of spoil off site and for spoil disposal; and
- Processes and procedures for the management of the environmental impacts of spoil transfer and reuse.

2. Legal and Other Requirements

Table 2-1 below details the applicable legislation and planning instruments considered during development of this Plan.

Table 2-1 Legislation and Planning Instruments

Legislation	Description	Relevance to this CSMP
Environmental Planning and Assessment Act 1979	This Act establishes a system of environmental planning and assessment of development proposals for the State.	The approval conditions and obligations are incorporated into this CSMP.
Contaminated Land Management Act 1997	This Act provides for a process to investigate and remediate land that has been contaminated and presents a significant risk of harm to human health. Section 60 of the Act is a "Duty to Report Contamination". This duty applies to owners of land and persons who become aware their activities have contaminated the land.	This plan discusses how Laing O'Rourke will manage works to comply with this Act in consultation with the Soil and Water Management Plan
Protection of the Environment Operations Act 1997	This Act includes all the controls necessary to regulate pollution and reduce degradation of the environment, provides for licensing of scheduled development work, scheduled activities and for offences and prosecution under this Act.	This plan defines how Laing O'Rourke will manage works to comply with this Act. The works will be conducted in accordance with the requirements of the EPL. The CSMW project early works will initially be completed under the Sydney Trains EPL until Laing O'Rourke obtains an EPL prior to commencement of construction for the project.
Protection of the Environment Operations (Waste) Regulation 2014;	This Act includes additional provisions to protect human health and the environment for a modern and fair waste industry in NSW. Changes within this regulation includes amended thresholds for environment protection licences and reforms to the waste levy system.	This plan outlines how Laing O'Rourke will manage waste disposal in accordance with the new waste reforms.
NSW Waste Avoidance and Resource Recovery Act 2001	This Act includes the majority of NSW's overarching objectives and guiding principles to encourage beneficial reuse and resource recovery. Implementation of a waste hierarchy in accordance with the principle of Environmentally Sustainable Development (ESD) is identified as a main objective of the Act, along with objectives to minimise the consumption of natural resources and waste generation.	This plan defines how Laing O'Rourke will classify spoil within the waste hierarchy guidelines and determine the most appropriate reuse option for spoil.

2.1 Planning Requirements

The CSMP addresses the following requirements:

- Sydney Metro City and Southwest - Chatswood to Sydenham Conditions of Approval (CoA) (SSI 15_7400) as modified – dated 9 January 2018
- The Sydney Metro City and Southwest - Environmental Impact Statement, dated 3rd May 2016
- The Sydney Metro City and Southwest – Submissions and Preferred Infrastructure Report, dated October 2016
- The Sydney Metro City and Southwest – Chatswood to Sydenham Modification 2 – Central Walk – Sydney Metro City and Southwest – (SSI Mod 2) – Determined in 2017
- Sydney Metro City & Southwest - Chatswood to Sydenham Staging Report
- The Sydney Metro Construction Environmental Management Framework (CEMF) v3; and
- Applicable Legislative Obligations

The Compliance Matrix in Appendix A provides an analysis of how the CSMP complies with CoAs, Revised Environmental Mitigation Measures (REMMs) and the CEMF (and by virtue Sydney Metro's objectives), as well as including any cross references with the Construction Environmental Management Plan (CEMP) that has been prepared in accordance with the CEMF.

2.2 Guidelines

Additional guidelines and standards relating to the management of spoil (with references relating to soil and water protection) include:

- Waste Classification Guidelines: Part 1 Classifying Waste (EPA 2014)
- Protection of the Environment Operations (Waste) Regulation 2014
- Infrastructure Sustainability Council of Australia - IS Technical Manual V1.2
- Landcom (2004). Managing Urban Stormwater: Soils and Construction. (Volume 1 of the 'Blue Book')
- DECC (2008). Managing Urban Stormwater: Soils and Construction. Volume 2D: Main Road Construction. (Volume 2D of the 'Blue Book')
- ASSMAC (1998). Acid Sulphate Soil Manual. Acid Sulphate Soil Management Advisory Committee, NSW
- Infrastructure Sustainability Council of Australia - IS Technical Manual V1.2
- Guidelines for the Management of Acid Sulphate Materials: Acid Sulphate Soils, Acid Sulphate Rock and Monosulfidic Black Ooze, RTA
- NSW Environmental Protection Authority - Assessing and Managing Acid Sulphate Soils
- Environment Protection Authority, Victoria Information Publication 655 - Acid Sulphate Soil and Rock.
- NSW EPA Orders and Exemption: https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/resource-recovery-framework/current-orders-and-exemption

2.3 Infrastructure Sustainability Council of Australia (ISCA)

The Project will pursue a rating under the IS Rating Scheme V1.2. This plan relates to several of the IS credits.

2.3.1 Lan-3 Contamination and Remediation

Site assessment follows the recommended approach in Schedule A 'Recommended general process for assessment of site contamination' of National Environment Protection (Assessment of Site Contamination) Measure 1999. Remediation options are identified and selected using a sustainability hierarchy. Sustainability appraisal of remediation options is undertaken against the sustainability indicators in Table 1 of 'A Framework for Assessing the Sustainability of Soil and Groundwater Remediation'. The effectiveness and durability of the remedial solution, and maintenance and monitoring, have been considered over the lifetime of the infrastructure and beyond.

2.3.2 Was-2 Diversion from Landfill

This credit aims for 100% diversion of spoil from landfill that meets the Virgin Excavated Natural Material classification or the Excavated Natural Material Order/Exemption.

2.4 LOR Severe Environmental Risks

LOR is committed to implementing necessary measures to negate severe environmental risks where possible and when relevant to a given project. A Severe Environmental Risk (SER) as defined in the LOR EMS is an activity if not managed effectively; severe environmental impacts could eventuate, resulting in permanent or long-term damage to the environment that is not easily rectified. They would substantially alter the receiving environment and result in a significant impact on the project's and Laing O'Rourke's environmental policy and objectives. Each SER provides clear guidance on the requirements and control measures that when implemented are intended to manage these risks. They describe the critical controls that must be in place, such that severe environmental impacts are prevented. Although there are no SER's directly relating to spoil, SER's that address a risk to soil and or water in relation to stockpile have been addressed in greater detail within the Construction Soil and Water Management Plan.

2.5 Relevance to Other Management Plans

The CSMP has been developed in accordance with C2S SSI 15_7400 COA – C1 to detail how the performance outcomes, commitments and mitigation measures specified in Chapter 11 of the PIR will be implemented and achieved during construction. This CSMP has also been developed as a requirement within the Construction Environmental Management Framework (CEMF). This document is considered consistent with the Construction Traffic Management Plan (CTMP), and the Construction Soil and Water Management Plan (CSWMP), both sub-plan of the Construction Environment Management Plan (CEMP - C2S SSI 15_7400 COA – C3).

2.6 Roles and Responsibilities

The roles and responsibilities of key construction Project personnel with respect to spoil are as follows in Table 2-2.

Table 2-2: Roles and Responsibilities

Project Director	Managing the delivery of the Project including overseeing implementation of spoil management measures. Act as Contractor's Representative.
Environmental Manager	Oversee the implementation of all spoil management initiatives. Responsible for managing ongoing compliance with the CoA and environmental document requirements.
Commercial Manager	Ensure that relevant spoil management requirements are considered in procuring materials and services.
Construction / Site Managers **Site Superintendent**	Manage the delivery of the construction process, in relation to spoil management across all sites in conjunction with the Environment Manager.
Sustainability Manager	Track and report spoil elements against sustainability targets.
Environment Coordinator	Manage the on-ground application of spoil management measures during construction. Monitor and report on spoil management during construction.
Project Engineer	Implement spoil management activities during construction works.
Environmental Representative	Provide a review and endorsement role to this plan. Conduct regular inspections to review and monitor implementation of this plan.
TfNSW	Provide a review and endorsement role to this plan.

3. Spoil Production

The information in this section of the CSMP is summarised from the Chatswood to Sydenham EIS and Central Walk, Modification 2 and incorporates Laing O'Rourke's proposed methodology to extract, manage and reuse of spoil.

For the purposes of this document, spoil is defined as 'rock' or 'other than rock' resulting from construction, excavation and tunnelling (excluding TBM tunnelling) activities. Demolition materials are not to be included within any spoil types or volumes and would be managed in accordance with the Construction Waste Management Plan (CWMP). Topsoil and fill are not classified as spoil for the purposes this document and topsoil management is addressed in the Construction Soil and Water Management Plan.

Detailed design of the project has been undertaken by LOR and builds upon the commitments made within the EIS that spoil quantities would be minimised as much as possible through design and to maximise the beneficial reuse of spoil when it is required. The following sections outline proposed spoil volumes and re-use/removal methodologies to be utilised for this project.

3.1 Spoil Volumes and Re-Use Targets

It is anticipated that the total spoil volume associated with the Project is approximately 266 400m³ of sandstone and shale, comprised primarily of material excavated from the cut and cover component of the project (230 000m³) and from the Central Walk and related ancillary works (33,000m³). An advance tunnel and associated shafts (3,400m^3) is also proposed to allow logistics movements of materials and spoil from the ESR Ghost platforms, and suburban island platforms to the Metro box without the need for night-time track possession works.

A recycling target of at least 90% has been adopted for the Project with 100% of the spoil that can be reused to be beneficially reused in accordance with the spoil hierarchy outlined in Section 4.3

Minimal topsoil was anticipated to be excavated at CSM. Topsoil that is removed as part of the Project is discussed separately in the CSWMP. All topsoil from the project will be separated and managed discretely to spoil.

Furthermore, spoil material created from the tunnelling activities (via TBMs) will be removed separately to the spoil produced at the Project and is not referenced further in this document.

3.2 Spoil Removal Methodology

3.2.1 Metro Box

The Metro Box and Station excavation component of the Project will adopt a top-down, multi-layered approach within its own footprint, following the removal of existing station infrastructure and ancillary structures. Once all above-ground infrastructure has been removed, the excavation of the shaft can commence and involves the removal of any topsoil. The Metro Box will be delineated into a grid system and in situ waste classification of strata will be conducted prior to excavation. RLs of each stratum will be determined and spoil will be removed in layers in accordance with the waste classification and tracked and documented into a Waste Register.

If there are identified contaminated areas, they would be demarcated prior to any ground works and removed methodically in accordance with their waste classification (see Section 4.2) and disposed of at an appropriate facility. The remaining, non-contaminated area would be separated into quadrants and excavated. During the excavation, the excavated material for each classification would be loaded separately onto waiting haul trucks for reuse/recycling or disposal at an appropriately licenced facility.

Following the removal of topsoil, subsoil and underlying spoil, the shaft would continue to be excavated, resulting in a temporary open shaft where materials and machinery will be lowered into the shaft to commence the horizontal and vertical underground excavation works across the entirety of the box's footprint. Following the complete excavation of the shaft at this initial first level, a concrete roof with permanent, small open portals will be constructed over the open shaft, permitting access from the surface to the underground levels via cranes and/or gantries. It is these smaller open portals that will provide ongoing access to the surface from the active extraction operations using cranes and/or gantries, including spoil removal operations during the ongoing excavations at depth to the metro station level.

Once the concrete roof has been completed, the surface of the roof will be utilised for operational uses such as machinery storage areas and transporting facilities such as truck access and loading areas.

The excavated spoil below the initial level will be transported from the excavation face to the access shafts and transported to the surface using the existing cranes. Once spoil has been brought to the surface, it will be immediately loaded into waiting trucks for immediate off-site transportation and disposal. This process would continue until all estimated volumes of spoil is removed from the Metro Box with no storage of spoil undertaken within any above ground areas.

Topsoil and subsoil stripped as part of the above ground operations will be managed in accordance with the CSWMP. Appropriate stockpile locations, erosion and sediment control measures and management protocols will be included on the Environmental Control Map as required.

3.2.2 Eastern Entry and Eastern Concourse

The eastern concourse and eastern pedestrian entry will be constructed utilising standard excavation and underground mining techniques. Figure 1.3 outlines the location of both the Central Walk and eastern entry with the following information outlining the construction and spoil methodologies for each individual section, that when combined, will result in a total of 36,400m³ of spoil.

Advanced Tunnel

An Advance tunnel (adit) will be excavated from within the Metro Box in the location of the Central Walk service corridor (same level as B1 in the Metro Box). The tunnel will be 80m long and will connect the Metro Box to the ESR Ghost Platform. The tunnel will be approximately 6m wide and 6m high with a spoil disposal volume of approximately 3000m^3.

From within the adit a shaft will be constructed to connect each of the suburban island platforms with the advance tunnel. These shafts will be constructed to the North of the advance tunnel and will generate approximately 400m^3. The purpose of these shafts and tunnel is to allow logistics movements for materials and spoil from the island platforms to the Metro box without the need for nigh- time track possession works.

Eastern Entry

The eastern pedestrian entry will be constructed on the eastern side of Chalmers Street, following the demolition of the existing Bounce Hostel building, through piling and standard excavation techniques to create a vertical shaft to form the proposed entry. The shaft will be excavated from the surface / street level down to the same level of the unused platforms of the T4 Eastern Suburbs Line which will be utilised as an access point for the Eastern Concourse. The total depth of the shaft will be approximately 8.3m deep with some minor local excavations extended marginally deeper for footings and air ducts. Spoil created by this excavation (approximately 7 000m^3) will be loaded onto waiting trucks in Randle Lane for immediate off-site transportation to the appropriate destination based on its classification. Ongoing access arrangement to Randle Lane and to basement car parking within Randle Lane would be maintained unless an agreement has been met between residences and Laing O'Rourke (further information is provided in the CTMP).

Eastern Concourse

Unlike the Metro Box, the eastern concourse will be constructed under the existing suburban platforms and will connect the new Metro Box concourse with the existing eastern suburban railway concourse. The mined excavation of the eastern concourse will occur following the installation of platform cross beams and under rail track slabs and will be carried out in several stages as detailed below:

Excavation of Suburban Island Platforms and Track Slab construction

The construction of the eastern concourse is required to be carried out as a mined solution. In order to achieve this, a combination construction methodology will be utilised, including the reinforcement of the suburban platforms through edge beam and track slab construction.

Approximately 1 000m^3 of material will be excavated from each of the four island platforms and will be excavated and removed via the shafts into the adit. Spoil material will be produced and if required, stored underground within the cavern or Sydney Yard, before being removed off-site via trucks to the appropriate destination based on its classification.

The reinforcement and strengthening of the suburban platforms directly above the future Central Walk via the installation of edge beams on either side of the platform must occur in preparation

for the track slab installation (Figure 3-1). This process involves strengthening the platform walls, placing the appropriate foundations to eventually connect the platforms to the track slabs which are placed on the tracks in between each set of platforms 16 - 23.

A “track slab” will then be constructed on Tracks 16 to 22. The track slab will be a top-down construction, consisting of a series of steel beams (several of which are hollow – Square Hollow Sections [SHS]) with a reinforced concrete deck on top and reinforced concrete slabs connecting the ends of the track slab to the B4 (canopy support beam portals located within each platform) or B6 beams (The Metro Box header beam – which connects the Central Walk to the Metro Box and provides track slab structure at Platform 16). The track slab provides initial structural support during the excavation and construction of the final Central Walk structure, following which time it performs as a component of the permanent built structure (Figure 3-2). Following completion of the track slab install, the entire structure is consolidated through the injection of these Square Hollow Sections of the track slabs with concrete, from within the platform excavations constructed prior. Injection of concrete binds the entire track slab structure to each other, the suburban platforms, as well as the Metro Box and the Eastern Entrance allowing for the mined excavation of the eastern concourse (Figure 3-3).

Mined excavation of the eastern concourse

The second significant excavation operation for the eastern concourse will be carried out from the Metro Box and undertaken following the installation of the track slabs and edge beams. The breakthrough between the eastern concourse and the Metro Box will facilitate the excavation face for the eastern concourse as a mined excavation (see Figure 3-3).

The eastern entrance will then be excavated in headings underneath the existing suburban railway lines using excavators (see Figure 3-3) and hydraulic breakers. Excavated material will be transported back to the loading area and vertically lifted to the Metro Box decking, to then be removed via truck to the designated disposal destination.

The final piece of excavation will be the escalator adits which shall be carried out from within the platform excavation and all excavated material will be removed as stated above via the Metro Box. A total of 26,000m^3 of material approximately will be removed during the construction of the eastern concourse and escalator adits.

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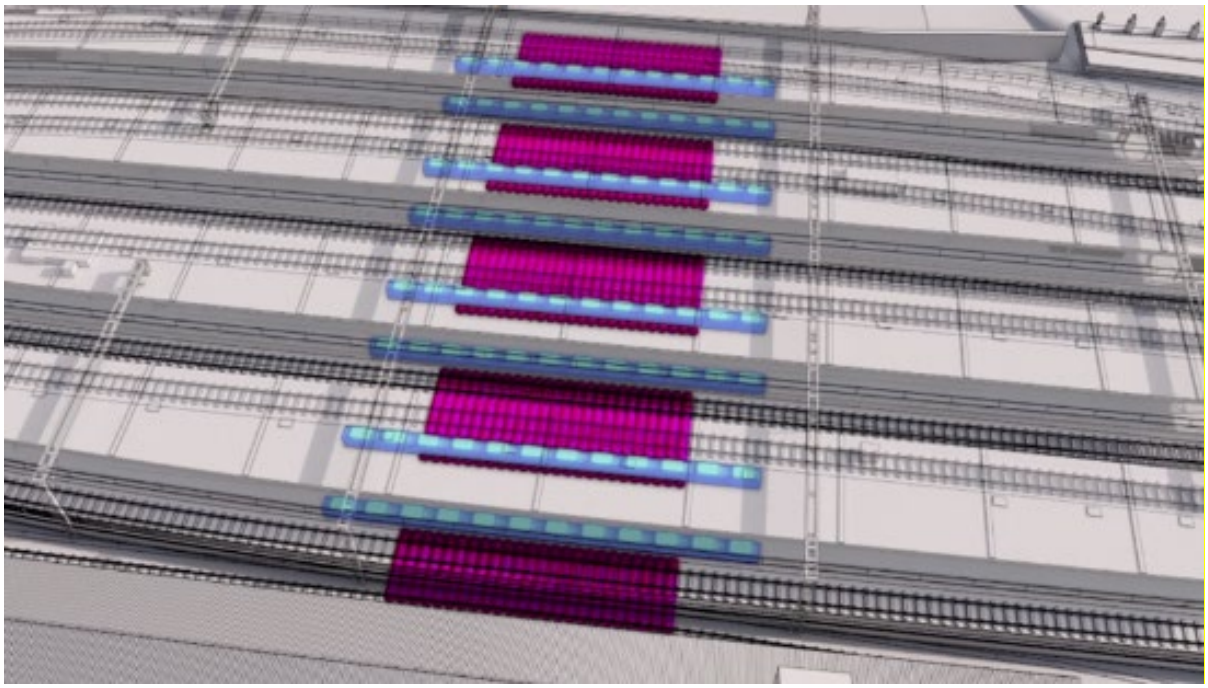

Figure 3-1: Eastern Concourse Construction – Edge beams can be visualised in blue – located within the platforms, adjacent to the tracks, but perpendicular to the track slabs (SHS) which are run between each platform (purple).

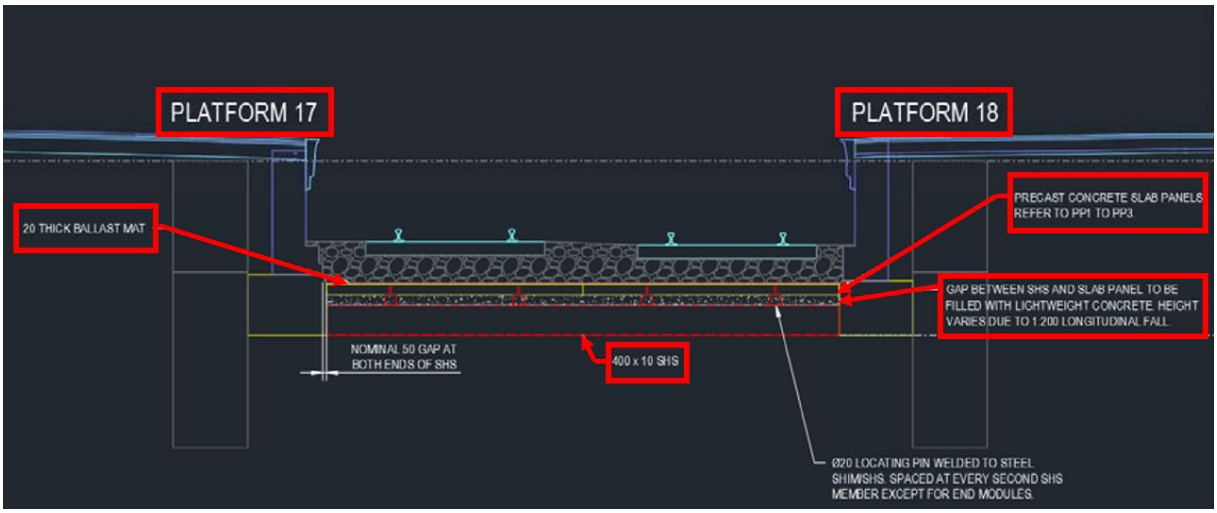

Figure 3-2: Example of the top down excavation technique for Track Slab construction. Note: SHS run parallel with each other and connect platforms. These are later injected with concrete infill to consolidate the entire track slab structure and allow excavation of the Eastern Concourse underneath.

Figure 3-3: Eastern Concourse Construction – Mining

3.3 Spoil Re-use

A recycling target of at least 90% has been adopted for the Project with 100% of the spoil that can be reused to be beneficially reused in accordance with the spoil hierarchy outlined in Section 4.3

Due to the restrained site, no opportunities exist to reuse any spoil within the Site with all spoil proposed to be hauled off-site for recycling and off-site reuse opportunities through subcontractors. Section 6 details the reuse options and discussing of locations.

3.4 Contaminated Materials

No contaminated materials would be classified as spoil throughout the Project with all contaminated material removed in accordance with Section 4.2. CSM would be subject to a Site Audit and Site Contamination Report that would be prepared and audited by a NSW EPA accredited site auditor to declare the land is suitable for that purpose and any conditions complied with.

Remedial Action Plans for the Metro Box, the Gasworks, and Central Walk would be prepared by a suitably qualified and experienced specialist in line with relevant legislative requirements. The RAP requirements will be addressed via a Validation Report for each of the RAPs.

Results of any contaminated land assessments, including existing Site Contamination Reports, and associated management measures are addressed in the CSWMP for any interactions of contamination with soil and water (surface water and/or groundwater).

4. Spoil Classification and Hierarchy

4.1 Spoil Material Types and Classification

Waste classification of spoil will be carried out as per the relevant NSW legislation. As noted in the Construction Soil and Water Management Plan (CSWMP), there are a number of contamination issues on the Project. These include contaminated soils, groundwater and vapour associated with the former use of the area as a gasworks and fill brought into the site during the initial construction of Central Station and associated tracks. The CSWMP documents the contamination management measures that will be implemented.

Spoil, other than virgin excavated natural material (VENM), will be sampled, analysed and characterised in accordance with the Waste Classification Guidelines: Part 1 Classifying Waste (EPA 2014) (the Guidelines) as required by the Construction Waste Management Plan (CWMP). Further information regarding the classification, spoil, VENM and ENM and other resource recovery exemptions are provided below. Note, due to rail infrastructure, natural ground surface is limited. As such topsoil is unlikely to be encountered on site.

General construction waste would be minimised by accurately calculating materials brought to the site, limited material packaging with any related waste classified and disposed of in accordance with the CWMP.

4.1.1 Topsoil and Fill

Imported fill, and topsoil to a much lesser extent occurs throughout the area between approximately 50-300mm of natural ground surface. Topsoil reuse shall be maximised on site to minimise the import of external topsoil for revegetation and landscaping purposes wherever practicable in accordance with the CSWMP. Fill will be classified and managed according to Contaminated Land protocols (as detailed in the CSWMP) or waste protocols (as detailed in the CWMP). Contaminated Land protocols include developing and implementing a Remedial Action Plan, preparing a validation report and disposing of contaminated material off-site. The material below the topsoil is considered to be spoil and is defined as any earthen material that is surplus to requirements or unsuitable for reuse within the Project works.

4.1.2 Virgin Excavated Natural Material (VENM)

Virgin excavated natural material is defined as natural material (such as clay, gravel, sand, soil or rock fines), that has been excavated or quarried from areas that are not contaminated with manufactured chemicals or with process residues, as a result of industrial, commercial, mining or agricultural activities.

The following four questions will be used when classifying material as VENM:

- Are manufactured chemicals or process residues present?
- Are sulfidic ores or soil present?
- Are naturally occurring asbestos soils present?
- Is there any other waste present?

If material meets the definition of VENM it can be reused on or offsite without prior testing. However, if there is any doubt as to whether the material is VENM, the Environmental Manager (EM) will sample and test the material as per the excavated natural material resource recovery exemption to confirm that the material is free of contaminants.

4.1.3 Excavated Natural Material (ENM)

The majority of spoil is expected to be classified as excavated natural material (ENM) classification criteria in accordance with the Protection of the Environment Operations (Waste) Regulation 2014 (the Regulation) current general resource recovery exemption, the excavated natural material exemption 2014.

ENM is defined as naturally occurring rock or soil (including but not limited to materials such as sandstone, shale, clay and soil) that has:

- Been excavated from the ground
- Contains at least 98% by weight natural material; and
- Does not meet the definition of Virgin Excavated Natural Material in the Act.

ENM does not include material that has been processed or contains acid sulphate soils or potentially acid sulphate soils.

4.2 General solid waste or other classifications

Spoil not classified as either VENM or ENM due to contamination from either construction material or other sources shall be characterised in accordance with the Waste Classification Guidelines: Part 1 Classifying Waste (EPA 2014) as required by the CWMP. This may include classification as General Solid Waste (Non-putrescible), Hazardous Waste or Special Waste.

4.2.1 Special Waste

Special Waste is a class of waste that has unique regulatory requirements. The potential environmental impacts of special waste need to be managed to minimise the risk or harm to the environment or human health.

Special waste is defined as any of the following:

- Clinical and related waste
- Asbestos waste
- Waste tyres; and
- Anything classified as special waste under an EPA gazettal notice.

4.2.2 Hazardous Waste

The following waste types (other than special waste or liquid waste) have been pre-classified by the EPA as ‘hazardous waste’:

- Containers, having previously contained a substance of Class 1, 3, 4, 5 or 8 within the meaning of the Transport of Dangerous Goods Code, or a substance to which Division 6.1 of the Transport of Dangerous Goods Code applies, from which residues have not been removed by washing or vacuuming
- Coal tar or coal tar pitch waste (being the tarry residue from the heating, processing or burning of coal or coke) comprising of more than 1% (by weight) of coal tar or coal tar pitch waste
- Lead-acid or nickel-cadmium batteries (being waste generated or separately collected by activities carried out for business, commercial or community services purposes)

- Lead paint waste arising otherwise than from residential premises or educational or childcare institutions; and
- Any mixture of the wastes referred to above.

4.2.3 General Solid Waste (Non-putrescible)

General Solid Waste (Non-putrescible) is any waste that is not classified as special waste, liquid waste, hazardous waste, restricted solid waste or general solid waste (putrescible).

4.2.4 Restricted Solid Waste

Currently, no wastes have been pre-classified by the EPA as 'restricted solid waste'. Restricted solid waste therefore currently only includes wastes assessed and classified as restricted solid waste in accordance with the procedures outlined under Step 5 of the Waste Classification Guidelines: Part 1 Classifying Waste (EPA 2014). That is, where waste has not been classified under Steps 1-4, waste generators must chemically assess their waste to determine the most appropriate waste classification within the EPA guideline by utilising the specific contaminant concentration (SCC) and/or toxicity characteristics leaching procedure (TCLP) test values.

If the waste is not chemically assessed, then the waste must be treated as hazardous waste and has to be treated prior to disposal at an appropriate licenced location.

4.2.5 Resource recovery exemptions

The Protection of the Environment Operations (Waste) Regulation 2014 enables the EPA to issue 'resource recovery exemptions' which allow for the beneficial reuse of wastes via land application or for use as a fuel. These exemptions enable a project to comply with the principle of 'wastes to resources for beneficial reuse' (where the wastes are fit for beneficial reuse). During the project, materials may be encountered that do not meet the VENM or ENM classification but are also not contaminated material. In these circumstances, the Project will check for existing resource recovery exemptions such as:

- The excavated public road material exemption 2014 (EPA)
- The reclaimed asphalt pavement exemption 2014 (EPA)
- The recovered aggregate exemption 2014 (EPA); and
- Raw mulch material exemption 2014 (EPA).

Should the existing resource recovery exemptions not be appropriate, the Project will consider application for a site-specific exemption established through consultation with the EPA.

4.3 Spoil Hierarchy

The Spoil Management Hierarchy listed in Table 4-1 has been developed to meet the objectives and principles of the NSW Waste Avoidance and Resource Recovery Act 2001 and the NSW Waste Avoidance and Resource Recovery Strategy 2007 and would be utilised to determine the most appropriate location for spoil.

Table 4-1: Spoil Management Hierarchy

Rank	Options	Example of Options	Potential for option to be used on the Project
1	Avoid and reduce spoil generation	Reduce the amount of spoil being generated through design and construction methodology.	Limited
2	Reuse within the Project	Reuse spoil for fill embankments and mounds within a short haulage distance of the source. Reuse spoil to restore any pre-existing contaminated sites within the project boundary. Reuse spoil as a feed product in construction materials.	Limited
3	Reuse for environmental works	Reuse spoil in native vegetation rehabilitation projects. Reuse spoil for coastal protection, such as beach nourishment and land raising. Reuse spoil in flood mitigation projects.	Limited
4	Reuse on other development projects	Reuse for fill embankments and mounds on projects within an economic transport distance from site. Reuse sand for manufacturing concrete and reuse shale for manufacturing bricks/ tiles.	Preferred
5	Reuse for land restoration	Reuse for land reclamation or remediation works Reuse to fill disused facilities, e.g. mines and quarries, to enable ecological rehabilitation or other ecologically beneficial end use.	Preferred
6	Reuse for landfill management	Reuse to cap completed landfill cells. Reuse in daily covering of landfill waste.	Limited
7	Dispose offsite as waste	Disposal of excess spoil as waste at an approved facility licenced to receive the material.	Potential but not preferred

5. Aspects and Potential Impacts

The key aspects and potential impacts associated with the management of spoil during the delivery of works are listed in Table 5-1. It should be noted that risks associated with contaminated soil and water (excluding spoil specifically) are assessed in the separate CSWMP and not within this document. Appendix B includes the full risk assessment, including control/mitigation measures that have been also included within Section 6. Also refer to the quantitative risk assessment in the CEMP.

These identified risks have been taken into account in the development of the spoil management strategy and site-specific procedures for the works.

Table 5-1: Aspects and Potential Impacts

Aspects	Potential impacts/opportunities
Earthworks spoil disposal.	• Incorrect classification of waste (spoil) resulting in incorrect / illegal disposal/re-use.
Potential for discovery of unexpected contaminated spoil during construction.	• Health effects resulting from airborne contamination, e.g. asbestos. • Complaints received from odours released during excavations. • Classification of spoil is changed, and disposal options altered, costs incurred associated with disposal of higher classification of waste.
Spoil re-use objectives	• Project requirements of 100% of spoil re-use or recycling not being met.
Noise from spoil transportation activities resulting in impact to residents and businesses.	• Disturbance to residents or neighbouring businesses. • Potential for complaints.
Dust from spoil transportation activities resulting in impact to residents and businesses.	• Disturbance to residents or neighbouring businesses. • Potential for complaints.
Spoil traffic disturbing public access between local roads.	• Disturbance to local residents resulting in complaints being made, limited access, potential for delays at local road access points resulting in complaints.

6. Spoil Management

The following information outlines the management of spoil following its in-situ removal to being transported off site, as well as the relevant measures to ensure spoil is adequately and safely removed to an appropriate location.

Without exception, all spoil removed from the site will be classified as per the NSW EPA Waste Classification Guidelines with the records of the quantity and final location of the spoil material retained (see Section 8).

6.1 Erosion and Sediment Control

Sediment and Erosion Control Plan is detailed within the Environmental Control Map (ECM) prepared for the Metro Box and Sydney Yard. The ECM and has been developed, reviewed, approved and implemented. Additional information of proposed erosion and sediment control measures are included within the CSWMP.

6.2 Spoil On-site Management

During the enabling works temporary stockpiles of spoil will be required in Sydney Yard while the material is classified in accordance with the Waste Classification Guidelines for disposal at a licenced landfill. As outlined in Section 3, any spoil produced from the Metro Box and Eastern Concourse and related works, will be removed, transported to the surface through the Metro Box or eastern entry portal and loaded directly into trucks for off-site transport to the designated disposal site. The constrained nature of the CSMW Project does not permit the reuse of spoil within the site's footprint.

No long-term stockpiles of spoil will be created in any above-ground areas. Spoil will be loaded onto trucks as soon as practicable. Should stockpiling of material be required, control measures would be implemented if stockpiles are left in situ for ≥ 5 days (in accordance with the project EPL).

Should any soil suspected of being contaminated spoil be unearthed, it would be tested in accordance with the CSWMP soil testing requirements and disposed of at the appropriately licenced facility.

6.3 Spoil Reuse and Disposal Options

Given the considerable quantity of spoil material which will be generated in a relatively short period of time, it is necessary to identify a number of potential spoil re-use and disposal locations. However, it is apparent that a large number of concurrent major infrastructure projects are under construction in the wider Sydney region. As a result, there is currently a significant demand for waste disposal sites from multiple large construction contractors. Therefore, not all sites have been secured at the time of writing this plan and will change over time depending on time and space availabilities.

Final disposal and reuse locations will be utilised subject to the Project Manager and PEM checking that appropriate approvals are in place, commercial terms are agreed to and relevant CoA, environmental, sustainability, community and traffic impacts are managed under the approved CEMP, sub plans and Construction Traffic Management Plan (CTMP) as required. Notwithstanding this however, a reuse target of at 90% of spoil produced has been adopted as part of this Project and would be reused in accordance with the hierarchy identified in Table 4-1.

Prior to transporting spoil, the haulage and disposal contractors will be required to produce the EPL for the licensed facility or adequate evidence that the location can be used as a waste facility in accordance with a S143 notice. It will be a contractual requirement for the contractor to regularly and accurately report on that spoil recycling and reuse locations, as well as spoil volumes generally in accordance with Appendix C of this plan. A list of each disposal facility which currently in use is contained within Appendix B of the Waste Management and Recycling Plan

Spoil monitoring would be undertaken in the required Monthly Sustainability Data Report (MSDR) with the final spoil locations audited by Laing O'Rourke on a 6-monthly basis for all spoil contractors with the results included within the six month compliance tracking report. At the end of the project, a mass balance of excavation volumes vs final disposal volumes would also be calculated.

6.4 Spoil Transport and Haulage

Spoil will be transported off site by registered road trucks to the approved transport routes and will either utilise the completed Sydney Yard Access Bridge or Randle Lane, depending on the location of the spoil's origin and activity occurring as discussed in Section 3.2.

Spoil haulage routes are identified in the CTMP and have been selected to minimise impacts to sensitive receivers, the travelling public, and the local community whilst meeting compliance with road traffic rules in relation to vehicle length and weight limits. The updated CTMP and relevant addendums to the CTMP for specific haulage routes and access can be viewed on the project website: https://centralstationmetro.com/documents/.

The spoil will be weighed by reading of axel weights using a weighbridge in Sydney Yard.

The PEM will ensure that a spoil tracking system is maintained as a component of the waste register required as part of the CWMP. This will document all spoil leaving site in terms of time and date, truck registration, classification, characterisation and location of disposal. Fields that will be included in the system are as follows:

- Date
- Docket Number
- Haulage Company/licence
- Material Classification
- Quantity in Tonnes
- Truck Identification Number
- Location of Spoil Generation Site
- Location of Spoil Receival Site

Spoil haulage via non-road methods (i.e. rail) was investigated within the Chatswood to Sydenham EIS (Section 8.2.3.), however this option was determined not to be feasible due to an insufficient length of available rail siding and additional rail infrastructure being required to transport spoil from the main construction site to the rail siding.

7. Training

All relevant personnel working on site will undergo site induction training relating to spoil issues. Continuous improvement of this Spoil Management Strategy will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

The training will cover the following issues such as:

- Legislative requirements (POEO Act, EPL etc.) including Section 120 (offence to pollute waters)
- Duty to notify of environmental harm (or the potential for it) including chain of reporting
- Spill containment and management procedure
- Contamination and Unexpected Finds; and
- Toolbox talks will also be used to further reinforce awareness of spoil issues where required.

Further details regarding staff induction and training are outlined in the CEMP.

8. Monitoring, Auditing and Reporting

Laing O'Rourke will regularly review the CSMP to ensure compliance with the Project and CEMP.

Typical records generated would include:

- Records of spoil volume amounts and disposal sites
- Records of testing of any spoil testing; and

- Records for contamination management – soil classification, spoil tracking, disposal dockets, remedial action plans, occupational hygienist clearances, and Site Auditor signoffs.

Results and outcomes of inspections, monitoring and auditing will be reported internally on a monthly basis. Six-monthly construction compliance reports will be prepared to report on compliance with the Project Approval.

Spoil monitoring would be undertaken in the required Monthly Sustainability Data Report (MSDR) and include the following.

- The volume of spoil reused within the Site, beneficially reused off-site amounts or disposed of off-site against the target set in Section 6.2.
- Destinations for spoil which has been beneficially reused off-site or disposed of off-site.

Environmental reporting will be undertaken in accordance with Sydney Metro City & Southwest Environmental Reporting Template SM ES-FT-421. Additional reporting requirements are included in the CEMP.

Any non-compliances arising out of the above monitoring, inspections and audits would be made aware to TfNSW in a timely manner. A review of the appropriate documentation would be undertaken by LOR management to determine the corrective actions to ensure the non-compliance does not happen again.

A register would also be kept, identifying any non-compliances and documenting the corrective and preventative actions.

9. Review and Improvement

The CSMP will be reviewed at least annually. Laing O'Rourke will undertake the ongoing development, amendment and updating of the CSMP to ensure it remains consistent with Project priorities, risk management, client requirements and Project objectives, taking into account:

- The status and progress of Laing O'Rourke's activities
- Changes in the design, delivery and operations processes and conditions
- Lessons learnt during delivery and operations
- Changes in other related Management Plans
- Requirements and matters not covered by the existing Management Plans
- Changes to Management Plans as directed by Sydney Metro's Representative under the Deed; and
- Where deemed appropriate in relation to items raised within inspections or audits.

As outlined within the CEMF, the CEMP and associated sub-plans have been reviewed by TfNSW and endorsed by the Environmental Representative and will be submitted to the Secretary of Department of Planning Industry and Environment for information prior to any construction works commencing.

10. Enquiries, Complaints and Incident Management

Environmental incidents and complaints are to be investigated, reported, documented, actioned and closed out as per the details provided in the CEMP and Community Consultation Strategy.

Should any significant spoil related environmental incident occur that causes or threatens to cause harm to the environment, community or any member of the community, being actual or potential harm to the health or safety of human beings or to threatened species, endangered ecological communities or ecosystems that is not trivial, the EPA would be notified immediately and the Secretary also notified as soon as possible within 24 hours of the incident occurring and include the time and date, details of the incident and any non-compliance with the Project's approval. This would be undertaken in accordance with the Project's Pollution Incident Response Management Plan (PIRMP). The actions taken to address the incident would be undertaken within the timeframe determined by the Secretary or relevant public authority.

Appendix A: Construction Spoil Management Compliance Matrix

No.	Measure	Timing	Requirement	Responsibility	Reference
	Project Approval – Specific Management Plan Requirements				
1	From commencement of construction until completion of construction, the approved ER must: (a) receive and respond to communications from the Secretary in relation to the environmental performance of the CSSI (b) consider and inform the Secretary on matters specified in the terms of this approval (c) consider and recommend any improvements that may be made to work practices to avoid or minimise adverse impact to the environment and to the community (d) review all documents required to be prepared under the terms of this approval, ensure they address any requirements in or under this approval and if so, endorse them before submission to the Secretary (if required to be submitted to the Secretary) or before implementation (if not required to be submitted to the Secretary) (e) regularly monitor the implementation of all documents required by the terms of this approval for implementation in accordance with what is stated in the document and the terms of this approval (f) notify the Secretary of an incident in accordance with Condition A41 of this approval (g) as may be requested by the Secretary, help plan, attend or undertake Department audits of the CSSI, briefings, and site visits (h) performance of the CSSI, follow the procedure in the Community Communication Strategy approved under Condition B3 of this approval to attempt to resolve the conflict, and if it cannot be resolved, notify the Secretary (i) review any draft consistency assessment that may be carried out by the Proponent, and provide advice on any additional mitigation measures required to minimise the impact of the work (j) consider any minor amendments to be made to the CEMP, CEMP sub-plans and monitoring programs that comprise updating or are of an administrative nature, and are consistent with the terms of this approval and the CEMP, CEMP sub-plans and monitoring programs approved by the Secretary and, if satisfied such amendment is necessary, approve the amendment. This does not include any modifications to the terms of this approval	During construction	C2S SSI 15_7400 COA – A24	Environmental Representative	Section 2.4

No.	Measure	Timing	Requirement	Responsibility	Reference
	(k) assess the impacts of minor ancillary facilities as required by Condition A18 of this approval; and (l) prepare and submit to the Secretary and other relevant regulatory agencies, for information, a monthly Environmental Representative Report detailing the ER's actions and decisions on matters for which the ER was responsible in the preceding month (or other timeframe agreed with the Secretary). The Environmental Representative Report must be submitted within seven (7) days following the end of each month for the duration of works and construction of the CSSI, or as otherwise agreed with the Secretary.				
2	The Secretary must be notified as soon as possible and in any event within 24 hours of any incident.	During Construction	C2S SSI 15_7400 COA – A41		Section 10
3	Notification of an incident under Condition A41 of this approval must include the time and date of the incident, details of the incident and must identify any non-compliance with this approval.	During Construction	C2S SSI 15_7400 COA – A42		Section 10
4	Any requirements of the Secretary or Relevant Public Authority (as determined by the Secretary) to address the cause or impact of an incident reported in accordance with Condition A41 of this approval, must be met within the timeframe determined by the Secretary or relevant public authority.	During Construction	C2S SSI 15_7400 COA – A43		Section 10
5	If statutory notification is given to the EPA as required under the POEO Act in relation to the CSSI, such notification must also be provided to the Secretary for information within 24 hours after the notification was given to the EPA.	During Construction	C2S SSI 15_7400 COA – A44		Section 10
6.	A Construction Environmental Management Plan (CEMP) must be prepared in accordance with the Construction Environmental Management Framework (CEMF) included in the PIR and the Department's Guideline for the Preparation of Environmental Management Plans to detail how the performance outcomes, commitments and mitigation measures specified in Chapter 11 of the PIR will be implemented and achieved during construction.	Before Construction	C2S SSI 15_7400 COA – C1	Project Environment Manager	Section 1.7
7.	The following CEMP sub-plans must be prepared in consultation with the relevant government agencies identified for each CEMP sub-plan and be consistent with the CEMF and CEMP referred to in Condition C3. The Construction Traffic Management Plan must also be prepared in accordance with the Construction Traffic Management Framework as required by Condition E81.	Prior to Construction	C2S SSI 15_7400 COA – C3	Project Environment Manager	Section 2.3

No.	Measure			Timing	Requirement	Responsibility	Reference
	ID	Required CEMP Subplans	Relevant Government Agencies to be consulted for each CEMP submission				
	a)	Noise and Vibration	City of Sydney Council				
	b)	Biodiversity	OEH and City of Sydney Council				
	c)	Air quality	N/A				
	d)	Soil and Water	DPE Water, City of Sydney, OEH, SES, NSW Fire and Rescue				
	e)	Groundwater	DPE Water				
	f)	Blasting	N/A				
	g)	Heritage	Heritage Council (or its delegate) and City of Sydney				
	h)	Construction Traffic	City of Sydney, RMS, Sydney Coordination Office				
	The following plans will also be prepared as required under section 3.4 of the CEMF: - Spoil						
	Project Approval – 24 Hour Construction						
8	E48 Notwithstanding Condition E36 of this approval and subject to Condition E47, the following activities may be undertaken 24 hours per day, seven (7) days per week: (a) tunnelling and associated support activities (excluding cut and cover tunnelling) (b) excavation within an acoustic enclosure (c) excavation at Central without an acoustic enclosure (d) station and tunnel fit out; and			During Construction	C2S SSI 15_7400 COA – E48	Project Manager	Section 1.5.4

No.	Measure	Timing	Requirement	Responsibility	Reference
	(e) haulage and delivery of spoil and materials.				
	Project Approval – Soils				
9	All reasonably practicable erosion and sediment controls must be installed and appropriately maintained to minimise any water pollution. When implementing such controls, any relevant guidance in the Managing Urban Stormwater Series must be considered.	During Construction	C2S SSI 15_7400 COA – E65	Project Manager Project Environmental Manager	Section 2.1
	Project Approval – Contaminated Sites				
10	A Site Contamination Report, documenting the outcomes of Phase 1 and Phase 2 contamination assessments of land upon which the CSSI is to be carried out, that is suspected to be, or known to be, contaminated must be prepared by a suitably qualified and experienced person in accordance with guidelines made or approved under the Contaminated Land Management Act 1997 (NSW).	Prior to Construction	C2S SSI 15_7400 COA – E66	Project Manager Project Environmental Manager	Section 3.4
11	If a Site Contamination Report prepared under Condition E66 finds such land contains contamination, a site audit is required to determine the suitability of a site for a specified use. If a site audit is required, a Site Audit Statement and Site Audit Report must be prepared by a NSW EPA Accredited Site Auditor. Contaminated land must not be used for the purpose approved under the terms of this approval until a Site Audit Statement is obtained that declares the land is suitable for that purpose and any conditions on the Site Audit Statement have been complied with.	Prior to Construction	C2S SSI 15_7400 COA – E67	Project Manager Project Environmental Manager	Section 3.4
12	A copy of the Site Audit Statement and Site Audit Report must be submitted to the Secretary and Council for information no later than one (1) month before the commencement of operation.	Prior to Construction	C2S SSI 15_7400 COA – E68	Project Environmental Manager	Section 3.4 and 8
13	An Unexpected Contaminated Land and Asbestos Finds Procedure must be prepared and must be followed should unexpected contaminated land or asbestos be excavated or otherwise discovered during construction.	During Construction	C2S SSI 15_7400 COA – E69	Project Environmental Manager	Construction Soil and Water Management Plan

No.	Measure	Timing	Requirement	Responsibility	Reference
14	The Unexpected Contaminated Land and Asbestos Finds Procedure must be implemented throughout construction.	During Construction	C2S SSI 15_7400 COA – E70	Project Manager Project Environmental Manager	Construction Soil and Water Management Plan
	Project Approval – Traffic, Transport and Pedestrian Access				
15	Investigation of non-road spoil haulage and material delivery	Prior to construction	C2S SSI 15_7400 COA – E84	Project Manager	Section 6.3
16	Access to basement car parking to properties off Randle Lane must be maintained at all times except in consultation with affected occupiers and agreement with affected owners for alternative parking, storage or other forms of compensation.	During Construction	C2S SSI 15_7400 COA – E89.1	Project Manager	Section 3.2.2
17	Waste generated during construction and operation is to be dealt with in accordance with the following priorities: (a) waste generation is to be avoided and where avoidance is not reasonably practicable, waste generation is to be reduced (b) where avoiding or reducing waste is not possible, waste is to be re-used, recycled, or recovered; and (c) where re-using, recycling or recovering waste is not possible, waste is to be treated or disposed of.	Prior to construction	C2S SSI 15_7400 COA – E106	Project Environment Manager	Section 4.2
	Revised Environmental Management Measures and Environmental Performance Outcomes				
18	All waste would be assessed, classified, managed and disposed of in accordance with the NSW Waste Classification Guidelines	During Construction	C2S EIS REMM – WR1	Project Environment Manager Project Engineer Site Superintendent	Section 4.2

	Revised Environmental Management Measures and Environmental Performance Outcomes				
19.	100% of the spoil that can be reused would be beneficially reused in accordance with the project spoil recovery reuse hierarchy.	During Construction	C2S EIS REMM – WM2	Project Environment Manager Project Engineer Site Superintendent	Section 4.3 and 6.2
20.	A recycling target of at least 90% would be adopted for the project	During Construction	C2S EIS REMM – WM3	Site Superintendent	Section 6.2
21	Construction waste would be minimised by accurately calculating materials brought to the site and limiting materials packaging	During Construction	C2S EIS REMM – WM4	Project Manager Site Superintendent	Section 4.1
22	Updated desktop contamination assessment is to be carried out. If sufficient information is not available to determine the remediation requirements and the impact on potential receivers, then detailed contamination assessments, including collection and analysis of soil and groundwater samples would be carried out. In the event of a Remediation Action Plan is required, these would be developed in accordance with *Managing Land Contamination: Planning Guidelines SEPP 55 – Remediation of Land* (Department of Urban Affairs and Planning and Environment Protection Authority, 1998) and a site auditor would be engaged.	Prior to construction and during construction	C2S EIS REMM – SCW1		Section 3.4
23	Erosion and sediment control measures would be implemented in accordance with *Managing Urban Stormwater: Soils and Construction Volume 1* (Landcom, 2004) and *Managing Urban Stormwater: Soils and Construction Volume 2* (Department of Environment and Climate Change, 2008a). Measures would be designed as a minimum for the 80th percentile; 5-day rainfall event.	During Construction	C2S EIS REMM – SCW3	Project Environment Manager Project Engineer Site Superintendent	Refer to the Construction Soil and Water Management sub-plan
24	Discharges from the construction water treatment plants would be monitored to ensure compliance with the discharge criteria in an environment protection licence issued to the project.	During Construction	C2S EIS REMM – SCW4	Project Environment Manager Project Engineer Site Superintendent	Refer to the Construction Soil and Water Management sub-plan

	Revised Environmental Management Measures and Environmental Performance Outcomes				
25	During the closure of Randle Lane, traffic control would be provided at either end. Reversing movements out of Randle Lane onto Elizabeth Street and Randle Street would not be carried out during the peak periods of 7 am to 10 am and 3 pm to 7 pm.	During Construction	C2S EIS REMM – T25		Section 3.2.2
26	During the closure of Randle Lane, access to basement car parking would be maintained where feasible and reasonable. If access cannot be maintained, alternative parking would be arranged.	During Construction	C2S EIS REMM – T26		Section 3.2.2
	Contractual Requirements				
27.	Construction Environmental Management Framework a) The Contractor must comply with the relevant requirements of the Sydney Metro Construction Environmental Management Framework (CEMF) SM ES-ST-204, as indicated in Table 1.1 of Annexure A. b) Where the CEMF requires the Contractor to submit a document for review, the Contractor must submit those Documents to the Principal's Representative for review in accordance with the Contract.	During Construction	MR-E Environmental Requirements – 2.1	Project Environment Manager Project Engineer Site Superintendent	Section 1.7 and 2.3
28	Register of Hold Points a) Principal contractors will identify hold points, beyond which approval is required to proceed with a certain activity. Hold points will be documented in relevant CEMP.	During construction	MR-E Environmental Requirements – 2.1	Project Manager Project Environmental Manager	Section 11
29.	Environmental Reporting a) The Contractor must provide a monthly report, using the Sydney Metro City & Southwest Environmental Reporting Template SM ES-FT-421. b) Within 5 Business Days of each Calendar Quarter Date, a register of Environmental Compliance Requirements (ECRs), which identifies progress, and evidence of compliance against each ECR, must be submitted to the Principal's Representative for review in accordance with the Contract. c) The register of ECRs must classify each ECR as: (i) Ongoing or Complete, to indicate their progress; and (ii) Compliant or Non-Compliant, to indicate compliance.	During Construction	MR-E Environmental Requirements – 2.2	Project Environment Manager Project Engineer Site Superintendent	Section 8

	Revised Environmental Management Measures and Environmental Performance Outcomes				
30	The Contractor's Monthly Sustainability Data Report (MSDR) must as a minimum, detail the Contractor's performance against the targets identified in the Spoil Management Plan on: (x) the volume of spoil reused within the Site, beneficially reused off-site or disposed of off-site against the Spoil Targets identified in the Spoil Management Plan (xi) destinations for spoil which has been beneficially reused off-site or disposed of off-site	During Construction	MR-Sustainability Requirements – 9j	Project Environment Manager Site Superintendent	Section 8
31	Identify and implement initiatives to both reduce spoil quantities which will be generated during the performance of the Contractor's Activities and maximise the beneficial reuse of spoil; and	During Construction	MR-Sustainability Requirements – 6.2i	Project Environment Manager Site Superintendent	Section 3.2 and 3.2
32	The CSM Contractor must identify and implement initiatives to both reduce spoil quantities which will be generated during the performance of the CSM Contractor's Activities and beneficially reuse 100% of reusable spoil, including topsoil.	During Construction	MR-Sustainability Requirements – 6.2j	Project Environment Manager Site Superintendent	Section 3 and Section 4.1.1.
33	The CSM Contractor must where appropriate reuse site-won materials onsite.	During Construction	C1 B07 2.5.4b.	Project Environment Manager Site Superintendent	Section 3.3 and Section 4

	Construction Environmental Management Framework				
34	Key NSW Legislative Requirements The following legislative requirements should be adhered to throughout construction works with regular reviews to be undertaken by TfNSW and its contractors. • Contaminated Land Management Act (1997) - Sydney Metro must follow the process where contaminated land is identified. • Environmental Planning and Assessment Act (1979) - Sydney Metro must adhere to mitigation measures and conditions within the planning approval documentation. The	During construction	CEMF Section 2.1		Section 2

Construction Environmental Management Framework					
	proponent and their contractors must endeavour to deliver in a consistent manner within the assessed scope of works. • Protection of the Environmental Operations Act (1997) - Where Sydney Metro projects are scheduled activities under Schedule 1 of the Act an Environment Protection Licence (EPL) must be obtained. • Waste Avoidance and Resource Recovery Act (2001) - Sydney Metro Principal Contractors must implement strategies to reduce waste volumes and report on waste generated.				
35	Construction Environmental Management Sub-Plans The Principal Contractor will prepare issue-specific environmental sub-plans to the CEMP and SMP which address each of the relevant environmental impacts at a particular site or stage of the Project. Issue specific sub-plans will include: - Spoil Management	Prior to construction	CEMF Section 3.4	Project Manager Project Environmental Manager	Section 2.3
36	Register of Hold Points Principal contractors will identify hold points, beyond which approval is required to proceed with a certain activity. Example activities include vegetation removal and water discharge. Hold points will be documented in relevant CEMPs.	During Construction	CEMF Section 3.8	Project Manager Project Environmental Manager	Construction Environmental Management Plan
37	Environmental Monitoring, Inspections and Auditing a) Issue specific environmental monitoring will be undertaken as required or as additionally required by approval, permit or licence conditions. b) The results of any monitoring undertaken as a requirement of the EPL will be published on the Principal Contractor's, or a project specific, website within 14 days of obtaining the results. c) Environmental inspections will include: a. Surveillance of environmental mitigation measures by the Site Foreman b. Periodic inspections by the Principal Contractor's Environmental Manager (or delegate) to verify the adequacy of all environmental mitigation measures. This will be documented in a formal inspection record. d) Regular site inspections by the ERs and TfNSW representatives at a frequency to be agreed with the Principal Contractor.	During Construction	CEMF Section 3.13	Project Environmental Manager	Section 8 and Construction Environmental Management Plan

Construction Environmental Management Framework					
	e) Principal Contractors will be required to undertake internal environmental audits. Internal audits will include: a. Compliance with approval, permit and licence conditions b. Compliance with the E&SMS, CEMP, SMP, sub-plans and procedures c. Community consultation and complaint response d. Environmental training records. e. Environmental monitoring and inspection results. f) TfNSW (or an independent environmental auditor) will also undertake periodic audits of the Principal Contractor's E&SMS and compliance with the environmental aspects of contract documentation, including the Construction Environmental Management Framework.				
38	Environmental Non-compliances • Principal Contractors will document and detail any non-compliances arising out of the above monitoring, inspections and audits. TfNSW will be made aware of all non-compliances in a timely manner. • Principal Contractors will develop and implement corrective actions to rectify the non-compliances and preventative actions in order to prevent the re-occurrence of the non-compliance. Contractors will also maintain a register non compliances, corrective actions and preventative actions.	During Construction	CEMF Section 3.14	Project Environmental Manager Project Manager	Section 8
39	Environmental Records and Compliance Reporting • Principal Contractors will maintain appropriate records of the following: • Site inspections, audits, monitoring, reviews or remedial actions. • Documentation as required by performance conditions, approvals, licences and legislation • Modifications to site environmental documentation (eg CEMP, sub-plans and procedures) • Other records as required by this Construction Environmental Management Framework. • Records will be retained onsite for the duration of works.	During Construction	CEMF Section 3.15	Project Environmental Manager Project Manager	Section 8 and Construction Environmental Management Plan

Construction Environmental Management Framework					
	• Additionally, records will be retained by the Principal Contractor for a period of no less than 7 years in total. Records will be made available in a timely manner to TfNSW (or their representative) upon request. • Compliance reports detailing the outcome of any environmental surveillance activity including internal and external audits (refer to Section 3.13) will be produced by the Principal Contractors Environmental Manager or delegate. These reports will be submitted to TfNSW at an agreed frequency.				
40	Review and Improvement of the E&SMS • Principal Contractors will ensure the continual review and improvement of the E&SMS. • A formal review of the E&SMS by the Principal Contractor's Senior Management Team will also occur on an annual basis, as a minimum. This review will generate actions for the continual improvement of the E&SMS and supporting management plans.	During Construction	CEMF Section 3.16	Project Environmental Manager Project Manager	Construction Environmental Management Plan
41.	Spoil Management Objectives The following spoil management objectives will apply to construction: • Minimise spoil generation where possible • Mandate the 100% reuse or recycling (on or off-site) of usable spoil • Manage with consideration to minimising adverse traffic and transport related issues • Manage with consideration of the impacts on residents and other sensitive receivers • Manage to avoid the contamination of land and water • Managed effectively to limit the potential risk to human health and the environment. • Maximise the beneficial reuse of spoil material from the Project; and • Address the Project wide objective to provide certainty of delivery by managing spoil in a manner that avoids impacts on construction activities and timing.	During Construction	CEMF Section 6.1	Project Environment Manager Project Engineer	Section 3.1, Section 3.3, Section 5, Section 6.2, Section 6.3
42.	Spoil Management Plan will include as a minimum: • The spoil mitigation measures as detailed in the environmental approval documentation • A link or reference to where traffic movements in relation to spoil are described • A register of spoil receipt sites that includes the site or project name, location, capacity, site owner and which tier the site is classified as under the spoil reuse hierarchy	During Construction	CEMF Section 6.2	Project Environment Manager Project Engineer Site Superintendent	Section 2.3. Section 3.3. Section 3.2.2. Section 4.2. Section 6.3

Construction Environmental Management Framework				
• The responsibilities of key project personnel with respect to the implementation of the plan • How spoil generation is minimised through the design development process • Procedures for the testing, classification, handling and reuse of spoil • Spoil management monitoring requirements • Compliance record generation and management				
43. Spoil Management Measures: • Records detailing the beneficial re-use of spoil either within the project or at off-site locations • Waste dockets for any spoil disposed of to landfill sites	During Construction	CEMF Section 6.2	Project Environment Manager Project Engineer Site Superintendent	Section 3.3, Section 8.
44. Spoil mitigation measures: • Implementing the spoil re-use hierarchy • Handling spoil to minimise potential for air or water pollution • Minimise traffic impacts associated with spoil removal	During Construction	CEMF Section 6.3	Project Environment Manager Project Engineer Site Superintendent	Section 4.1 Section 4.3

Appendix B: Construction Spoil Risk Assessment

The full project-wide environmental risk assessment included within Appendix C of the CEMP.

Appendix C Spoil Tracking Register Template

Haulage Date	Tonnes (Net Weight)	Docket/Invoice Number	Vehicle Registration	Waste Description on Docket	Waste Classification *Selection 1*	Waste Sub-Classification *Selection 2*	Waste Code (Hazardous Waste Only) *Selection 3*	Waste End Use *Selection 4*	Transporter *Selection 5*	Disposal Company and Address *Selection 6*
					Please Select	*Please Select*	*Please Select*	*Please Select*	*Please Select*	*Please Select*
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Sydney Metro
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22 May 2023

Ref: CSMW Spoil Rev 9

Dear Carolyn

RE: Endorsement of Construction - Construction Spoil Management Plan Revision 09 - Central Station Main Works

Thank you for providing the following document for Environmental Representative (ER) review and approval as required by the Condition of Approval A24 (j) of the Sydney Metro City & Southwest project (SSI – 15_7400 January 9 2017) and Table 6 of the Staging Report:

- Sydney Metro City and Southwest, Central Station Main Works Project - Construction Spoil Management Plan (Revision 9, dated April 2023)

The Plan was originally developed to address the CEMF, Sec. 12. Revision 9 includes updates as part of a regular review conducted by LOR. Updates in the Plan comprised minor changes only.

As an approved ER for the Sydney Metro City & Southwest project, and as required by Condition A24(j) of the Infrastructure Approval and Table 6 of the Staging Report, I have reviewed the revised document. The updates are considered to represent a "minor" amendment hence the revised document (Revision 9 dated April 2023) is approved.

Yours sincerely

Michael Woolley
Environmental Representative – Sydney Metro – City and South West