Pre-Construction Minor Works Approval Form

Minor Works are defined as any low impact activities that are undertaken prior to the commencement of 'construction' as defined in the project's applicable planning approval. However if Minor Works affect or potentially affect heritage items, threatened species, populations or endangered ecological communities, these works are defined as 'construction' unless otherwise determined by the applicable planning authority.

Minor Works approvals do not remove any obligation to comply with the project's applicable planning approval conditions (including requirements prior to 'any works' commencing) or obtain any other applicable permits, licenses or approvals as necessary.

This application and all supporting information must be submitted to TfNSW/the Environmental Representative as one (1) PDF file at least 10 business days prior to the commencement of the proposed Minor Works.

Part 1: Application	
Contractor:	John Holland & Laing O'Rourke joint venture (JHLOR)
Project:	Sydenham Station and Junction
Application Title: (e.g. Smith St trenching works)	624 Location Box Installation
Application Number:	SSJ-PCMW-003
Application Date:	~~28/02/2018~~ 1/3/18
Planning Approval:	Sydney Metro City and Southwest – Chatswood to Sydenham - Environmental Impact Statement Sydney Metro City and Southwest - Environmental Impact Statement – Sydenham Station and Sydney Metro Trains Facility South Modification Report (MOD 4) Sydney Metro City and Southwest - Environmental Impact Statement – Sydenham Station and Sydney Metro Trains Facility South Modification Submissions Report Sydney Metro City and Southwest Infrastructure Approval SSI 7400 (as modified)
Minor Works Categories: • Highlight as applicable. • If Items 4, 8 or 11 are applicable, this form must be endorsed by an Environmental Representative.	1. Survey, survey facilitation and investigations works (including road and building dilapidation survey works, drilling and excavation). 2. Treatment of contaminated sites. 3. Establishment of ancillary facilities (excluding demolition), including construction of ancillary facility access roads and providing facility utilities. 4. Operation of ancillary facilities that have minimal impact on the environment and community. 5. Minor clearing and relocation of vegetation (including native). 6. Installation of mitigation measures, including erosion and sediment controls, temporary exclusion fencing for sensitive areas and acoustic treatments. 7. Property acquisition adjustment works, including installation of property fencing and utility relocation and adjustments to properties. 8. Utility relocation and connections. 9. Maintenance of existing buildings and structures. 10. Archaeological testing under the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010) or archaeological monitoring undertaken in association with other Minor Works to ensure there is no impact on heritage items. 11. Any other activities that have minimal environmental impact, including construction of minor access roads, temporary relocation of pedestrian and cycle paths and the provision of property access.
Planning Authority Determination:	*If 'Yes', this completed form must be endorsed by an Environmental Representative, approved by TfNSW and submitted to the applicable planning authority to determine that the works are not defined as 'construction'.*

Will the proposed works affect or have the potential to affect heritage items, threatened species, populations or endangered ecological communities?	No – in accordance with the information presented within the EIS and Modification Report there will be no impacts associated with the works that will affect heritage items, threatened species, populations or endangered ecological communities. An addendum Historical Archaeological Research Design (ARD) for the Sydenham Station and Sydney Metro Trains Facility South (the project as modified) was completed by Artefact (January, 2018). The report concluded that an Unexpected Finds Procedure would be sufficient for managing works within the project area. See Appendix 2.

Part 2: Details

Site Description Overview

This overview is based on information from the EIS, Modification Report and Modification Submissions Report.

The site is a typical rail site with track, rail and ballast extending from Bedwins Road Bridge at the city end and branching out past Sydenham Station towards Tempe Station on the T4 line, Marrickville Station on the T3 line and the XPT Maintenance Facility.

There are a number of buildings and structures on the site including the State Heritage listed Sydenham Station and the Sydenham Pit and Pump Station. Other buildings and structures include the XPT Maintenance Facility, the Geotechnical Site Office and the Sydenham Signal Control Centre.

Vegetation on the site includes grasses, shrubs, weeds and planted street trees.

The site includes the Sydenham Pit, which receives water from the local Marrickville catchment. A concrete channel, known as the "Eastern Channel", runs through the site from north to south and discharges stormwater from the wider catchment and the Sydenham Pit to the Cooks River. There is a number of drainage pits located throughout the site, including a number of pits located within the track.

The area is surrounded by a mixture of industrial/commercial properties and residential properties. There are no major arterial roads in the vicinity of the project.

Description of Works

Describe the proposed Minor Works:

Including work methodologies, site location(s) and site description(s) (e.g. landscape type, waterways, etc.).

The works will involve the construction and commissioning of a location box adjacent to existing Sydney Trains signalling equipment within the rail corridor – See Appendix 1.

The box would be approximately 1m x1m x 2m high – see example in the photo adjacent.

The works would involve the following:

- Service searching using NDD truck
- Minor excavation and removal of concrete slab
- Installation of small base slab using bags of cement
- Installation of plinths
- Installation of case
- Connection of cables
- Commissioning

Plant used would be:

- 14t excavator
- 14 Hydrema (dump truck)
- Various hand tools

All plant would enter via existing Sydney Trains access gates.

Other works would be completed at existing Sydney Trains location boxes within the corridor. These works would be limited to electrical wiring works within the boxes only and would have negligible impacts.

Planned Commencement Date:	~~30th March, 2018~~ 26/5/2018

	It is expected that works will be completed over two possession weekends, however it may take longer due to potential interface issues with Sydney Trains.
Local Sensitivities: Describe the presence (if any) of local sensitive environmental areas and community receptors	• There are a number of residential properties located along Bridge St and Railway Rd. These properties may be sensitive to excessive noise. The properties nearest the rail corridor have been previously treated with double glazing to reduce rail noise. • The works are not expected to be noisy and any plant used will be operated during the day. • Heritage – there are a number of heritage structures within the project footprint including Sydenham Station and the Sydenham Pit and Pump Station. These works will not impact these structures at all.

Part 3: Environmental Risk Assessment and Management

Prepare an Environmental Risk Assessment (in accordance with the *Sydney Metro Risk Management Standard*) and an Environmental Control Map for the proposed Minor Works and attach as Appendix 1.

If an Environmental Risk Assessment and/or an Environmental Control Map for the proposed Minor Works is/are already contained in existing documentation, attach the relevant section(s) as Appendix 1.

Documentation: List any existing documents (including those referenced above) that the proposed Minor Works will be undertaken in accordance with and attach as Appendix 2 (e.g. plans, procedures, procedures, etc.).	An Environmental Risk Assessment and an ECM for the Works is included within Appendix 1. Unexpected finds procedures for contamination and items or deposits with heritage significance, and the ARD are included in Appendix 2.

Part 4: Workforce Notification

How will the environmental and community risks and associated mitigation measures of the proposed Minor Works be communicated to the contractor's workforce?	A site induction will be provided to all personnel working on the project site. The induction will include relevant environmental aspects and risks associated with works on the project site. Works will be undertaken in accordance with a SWMS or JSEA (depending on whether the works meets the definition of High Risk Construction Works in accordance with Clause 291 WHS Regulation). SWMS will be reviewed by the JHLOR Environmental Manager.

Part 5: Community Consultation

What community consultation has been undertaken already?	Works were included in the Sydney Trains notification for the WE40 possession works. See Appendix 3.
What community consultation is planned to be undertaken?	New notifications will be distributed if required in accordance with the contract and Community Liaison Implementation Plan (CLIP) requirements and prior to any Out of Hours Works.

If drafted already, attach applicable Community Notification as Appendix 3.

Part 6: Contact Details

Nominate contractor's project manager, environmental and communications contact(s).

Name:	Neil Ivison	**Position:**	Project Director	**Phone:**	
	Cameron Newling		Environmental Manager		
	Sanjin Muhic		Stakeholder and Community Relations Manager		

Part 7: Signature			
This signature acknowledges that the proposed Minor Works will be undertaken in accordance with this application, have minimal environmental impact and are not defined as 'construction' in accordance with the applicable planning approval.			
Name:	CAMERON NEWLING		
Signature:		**Date:**	1/3/18

Determination Page

(TfNSW/Environmental Representative Use Only)

12. Endorsement/Approval

These signatures represent formal endorsement/approval for the proposed Minor Works to commence in accordance with this application and the applicable planning approval requirements (subject to any determination from the applicable planning authority as may be required by the planning approval conditions).

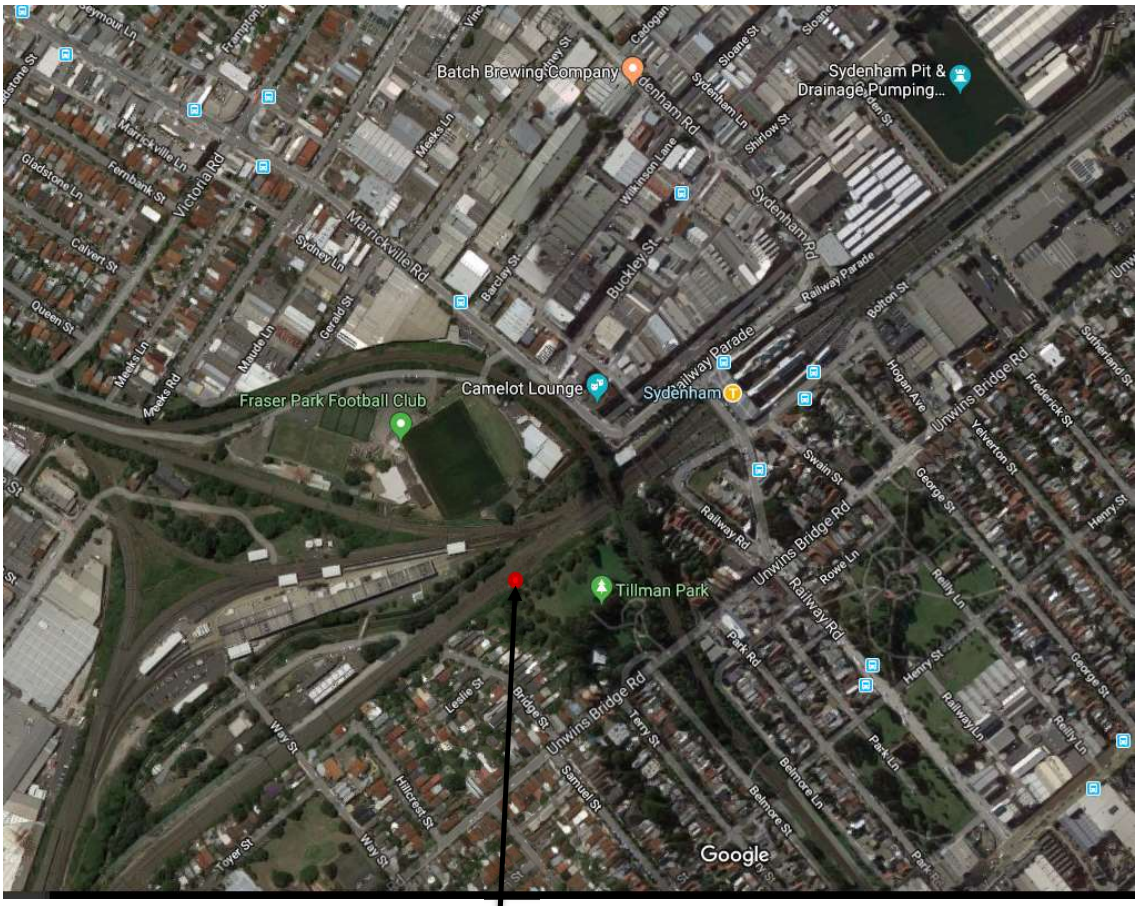
	TfNSW Principal Manager, Communication & Engagement – Endorsement (required for all applications)	TfNSW Principal Manager, Sustainability, Environment & Planning – Approval (required for all applications)	Environmental Representative – Endorsement (required as necessary in accordance with the applicable planning approval, optional for all other circumstances)
Signature:	J Wallwork on behalf of Anita Brown		
Name:	Jessica Wallwork	FIL GERONE	Annabelle Tungol Reyes
Date:	1/3/18	26/3/18	8/03/2018
Comments:	Note: pls confirm access gate being used for the work.		*Supporting letter attached as Appendix 4 if necessary.*
Conditions:	- if notification expires & work is not complete a new notification is req. - if night works are req. another notification is req. to be issued		*Supporting letter attached as Appendix 4 if necessary.*

☑	Approved (by TfNSW)
☐	Endorsed (by Environmental Representative)
☐	Rejected

Appendix 1: Cover Page

Work area, Environmental Risk Assessment and Environmental Control Map.

Work Area



Work area – expanded view

Appendix A: Sydney Metro Risk Matrix

A1 Consequence Table

Consequence Table						
Rating	**C6**	**C5**	**C4**	**C3**	**C2**	**C1**
Descriptor/ Impact Area	**Insignificant**	**Minor**	**Moderate**	**Major**	**Severe**	**Catastrophic**
Health and Safety (Injury and Disease)	Illness, first aid or injury not requiring medical treatment.	Illness or minor injuries requiring medical treatment.	Single recoverable lost time injury or illness, alternate/restricted duties injury, or short-term occupational illness.	1-10 major injuries requiring hospitalisation and numerous days lost, or medium-term occupational illness.	Single fatality and/or 10-20 major injuries/permanent disabilities/chronic diseases.	Multiple fatalities and/or >20 major injuries/permanent disabilities/chronic diseases.
Environment	No appreciable changes to environment and/or highly localised event.	Change from normal conditions within environmental regulatory limits and environmental effects are within site boundaries.	Short-term and/or well-contained environmental effects. Minor remedial actions probably required.	Impacts external ecosystem and considerable remediation is required.	Long-term environmental impairment in neighbouring or valued ecosystems. Extensive remediation required.	Irreversible large-scale environmental impact with loss of valued ecosystems.
Customer Experience/ Operational Reliability	Short duration disruptions affecting part of one transport mode.	Minor disruptions affecting several parts of one transport mode.	Serious disruptions affecting operation of one complete transport mode.	Major disruptions affecting operations of one transport mode with network-wide effects on one or more other modes of transport.	Short duration shutdowns or substantial disruptions affecting multiple transport modes with sector-wide cascading effects.	Extensive shutdowns or extended disruptions with economy-wide effects.
Government/ Stakeholder / Public Trust/ Confidence	Negative article in local media. No discernible reaction/apprehension. Goodwill, confidence and trust retained.	Unease – Series of negative articles in local/state media. Confidence remains with some minor loss of goodwill or trust. Recoverable with little effort or cost. Some continuing scrutiny/attention.	Disappointment – Extended negative local/state media coverage. Confidence and trust dented but are quickly recoverable at modest cost within existing budget and resources.	Concern – Short-term negative state/national media coverage. Confidence and trust are diminished but are recoverable with time, staff effort and additional funding.	Displeasure – Extended negative state/national media coverage. Confidence and trust are damaged but recoverable at considerable cost, time and staff effort.	Outrage – Material change in the public perception of the organisation. Confidence and trust are severely damaged, possibly irreparably, and full recovery both questionable and costly.
Regulatory or Legal Breach	Low-level non-compliance with legal and/or regulatory requirement or duty by individuals or TfNSW.	Minor non-compliance with legal and/or regulatory requirement or duty. Investigation and/or report to authority.	Moderate non-compliance. Subject to comment and monitoring from applicable regulator. Small fine and no disruption to services.	Major breach resulting in enforcement action and/or prohibition notices. Substantial fine and no disruption to services.	Substantial breach resulting in prosecution, fines and/or litigation. Licence or accreditation restricted or conditional affecting ability to operate.	Prosecution leading to imprisonment of TfNSW executive. Loss of operating licence.
Management Effort/ Organisational Fatigue	An event, the impact of which can be absorbed as part of normal activity.	An event, the impact of which can be absorbed but some additional management effort is required.	An event, the impact of which can be absorbed but much broader management effort is required.	Major event which can be absorbed, but substantial management effort is required.	Severe event which requires extensive management effort but can be survived.	Catastrophic event with the clear potential to lead to the collapse of the organisation.
Benefit Realisation of Initiative, Program or Project	No time delay with initiative or project but it will incur a slight decrease in the benefits realised.	Minor delay with the initiative and/or a minor decrease in the benefits realised; or minor delay on the project or another project, with no public implications.	Several delays with the initiative and/or moderate decrease in benefits realised; or completion date missed for non-critical path project.	Major delays with the initiative and/or major decrease in benefits realised; or publicly announced portion/milestone missed or final completion date missed with demonstrable mitigating external circumstances.	Severe delays with initiative, which impacts across divisions and/or significant decrease in benefits realised; or publicly announced portion/milestone missed or final completion date missed on critical path project.	Failure to realise benefits of the initiative which adversely affects the enterprise-wide operations of TfNSW; or publicly announced portion/ milestone significantly missed or final completion date significantly missed on critical path project.
Budget, Costs or Revenue	< $100k	$100k – $1m	$1m – $10m	$10m – $50m	$50m – $100m	> $100m

A2 Likelihood Criteria

Likelihood						
Rating	**L6**	**L5**	**L4**	**L3**	**L2**	**L1**
Descriptor/ Definition	**Almost Unprecedented**	**Very Unlikely**	**Unlikely**	**Likely**	**Very Likely**	**Almost Certain**
Qualitative Expectation	Not expected to ever occur during time of activity or project	Not expected to occur during the time of activity or project	More likely not to occur than occur during time of activity or project	More likely to occur than not occur during time of activity or project	Expected to occur occasionally during time of activity or project	Expected to occur frequently during time of activity or project
Sydney Metro Probability Analysis	<10%	10-25%	25-50%	50-75%	75-90%	>90%
Quantitative Frequency	Less than once every 100 years	Once every 10 to 100 years	Once every 1 to 10 years	Once each year	1-10 times every year	10 times or more every year

A3 Risk Matrix

Risk Rating A – Very High B – High C – Medium D - Low			**Consequence**					
			Insignificant	Minor	Moderate	Major	Severe	Catastrophic
			C6	**C5**	**C4**	**C3**	**C2**	**C1**
Likelihood	Almost certain	**L1**	**C**	**B**	**B**	**A**	**A**	**A**
	Likely	**L2**	**C**	**C**	**B**	**B**	**A**	**A**
	Possible	**L3**	**D**	**C**	**C**	**B**	**B**	**A**
	Unlikely	**L4**	**D**	**D**	**C**	**C**	**B**	**B**
	Rare	**L5**	**D**	**D**	**D**	**C**	**C**	**B**
	Almost unprecedented	**L6**	**D**	**D**	**D**	**D**	**C**	**C**

Risk Assessment

This Risk Assessment has been undertaken in accordance with the requirements of *Sydney Metro Risk Management Standard*.
Note; **C** = Consequence & **L** = Likelihood as per *Sydney Metro Risk Management Standard – Appendix A Sydney Metro Risk Matrix*

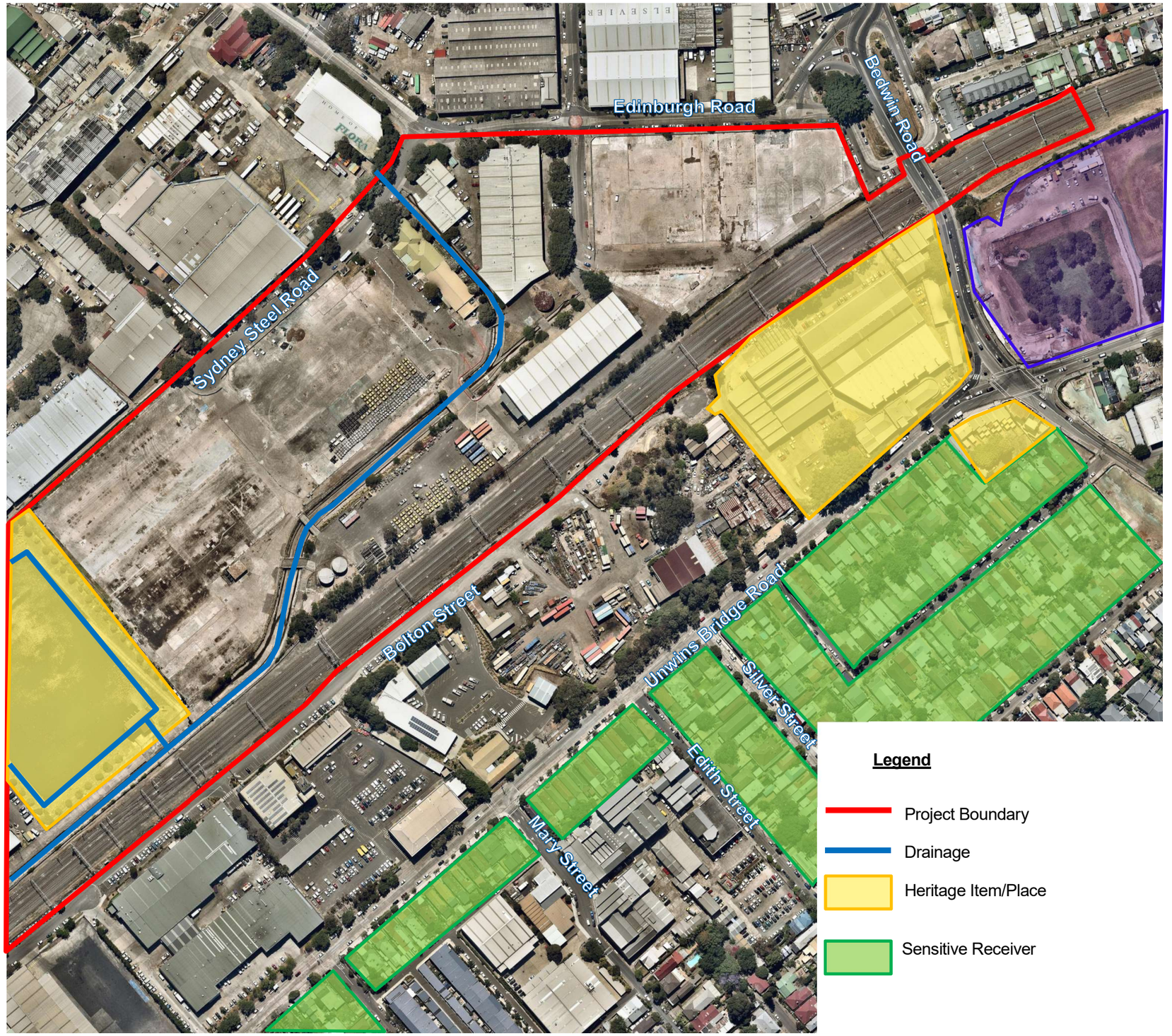
Aspect	Potential Environmental Impact	Initial Risk Rating			Control Measures	Residual Risk Rating		
		C X	L =	Risk		C X	L =	Risk
Survey								
Service Searching								
Contamination uncovered during service searching works	Mixing of contaminated materials with non-contaminated materials	**C4**	**L4**	**Med**	Induction to include contamination management requirements. Implement unexpected finds procedure	**C4**	**L5**	**Low**
Items of heritage significance uncovered during service searching works	Damage to heritage items or archaeological deposits	**C3**	**L5**	**Med**	Induction to include heritage management requirements. No works to occur within the heritage curtilage of Sydenham Station and Sydenham Pit. Implement unexpected finds procedure as per the ARD	**C3**	**L6**	**Low**
Runoff from service searching process	Service searching water entering local stormwater and impacting on water quality	**C5**	**L5**	**Low**	Set up erosion and sediment controls as appropriate (i.e. sandbags) if service searching water is likely to generate runoff.	**C5**	**L6**	**Low**
Service Searching Waste	Incorrect handling or disposal of service searching waste leading to environmental degradation Exposure of Potential Acid Sulphate soils	**C4**	**L4**	**Med**	Service searching waste is deemed to be liquid waste. The waste must be lawfully transported and disposed of to a licenced facility. Exposed Potential Acid Sulphate Soil within the excavations will be kept wet during the works. The excavations will be backfilled immediately to prevent any Potential Acid Sulphate Soils from oxidising.	**C4**	**L5**	**Low**

Aspect	Potential Environmental Impact	Initial Risk Rating			Control Measures	Residual Risk Rating		
		C X	L =	Risk		C X	L =	Risk
Noise from vacuum truck	Noise from vacuum truck impacting on sensitive receivers Noise impacts outside standard construction hours	C5	L4	Low	Works to occur in during standard construction hours where possible Vacuum truck to be positioned so that the noisier part of the truck points away from sensitive receivers, where possible Follow the appropriate approvals process and submit Out of Hours Work applications for Acoustic Advisor endorsement and Environmental Representative approval. Mitigation measures to be implemented in accordance with the Construction Noise Strategy.	C5	L6	Low
Construction of location box								
Contamination uncovered during excavation works	Mixing of contaminated materials with non-contaminated materials	C4	L4	Med	Induction to include contamination management requirements. Implement unexpected finds procedure	C4	L5	Low
Items of heritage significance uncovered during excavation works	Damage to heritage items or archaeological deposits	C3	L5	Med	Induction to include heritage management requirements. No works to occur within the heritage curtilage of Sydenham Station and Sydenham Pit. Implement unexpected finds procedure	C3	L6	Low
Noise from plant	Noise from plant impacting on sensitive receivers Noise impacts outside standard construction hours	C5	L4	Low	Works to occur in during standard construction hours where possible Plant to be positioned so that the noisier part of the rig points away from sensitive receivers, where possible Follow the appropriate approvals process and submit Out of Hours Work applications for Acoustic Advisor endorsement and Environmental Representative	C5	L6	Low

Aspect	Potential Environmental Impact	Initial Risk Rating			Control Measures	Residual Risk Rating		
		C X	L =	Risk		C X	L =	Risk
					approval. Mitigation measures to be implemented in accordance with the Construction Noise Strategy.			

Environmental Control Map

Sydenham Station and Junction – Northeast Portion



Key Environmental Risks & Controls

No works are permitted outside the red project boundary or within protected areas

Report all incidents and any complaints

Notify Environment Manager any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

SOIL AND WATER:

Hazardous substances must be stored correctly to prevent spills

ERSED controls to be installed as per this SEP and the Erosion and Sedimentation control plans (ESCP) and report damaged controls

No mud/ sediment to be tracked outside the site area

FLORA AND FAUNA

No vegetation to be impacted

WASTE:

Place rubbish in appropriate bins, do not litter
Waste must only be disposed off site at licenced waste facilities, meaning they must hold an Environment Protection Licence to receive waste

IMPORTING MATERIALS:

Obtain reports/ certificate for all imported material prior to delivery to site. The paperwork must be checked by the Environment Team to ensure it meets EPA requirements

AIR QUALITY:

Dust suppression measures must be used to prevent impacting nearby residents and all loads must be covered

NOISE AND VIBRATION:

Standard construction hours are 7am to 6pm M-F; 8am—1pm Sat – all Out of Hours Works are subject to approval in accordance with the Conditions of Approval and EPL

No works Sundays or Public Holidays

No idling or parking outside residential properties

High noise impact works only permitted 8am to 5pm M-F; 8am to 1pm

Sat and in continuous blocks not exceeding 3 hours each with a minimum respite of 1 hour between each block

TRAFFIC:

Parking only within designated areas and use only approved haul routes

No queuing in residential streets before or after hours

HERITAGE:

Cadastral survey only permitted in Heritage Areas

Key Contacts		
Cameron Newling	Environmental Manager	0419 727 445
Ian Butler	Utilities Manager	0409 412 394
Jamie Jack	Construction Manager Station	02 4913 7612
Paul Field	Construction Manager Sydney Water	02 9867 4211
Laura Stewart	Stakeholder and Community Relations Manager	0455 092 638

Environmental Control Map

Sydenham Station and Junction – Centre Portion

Key Environmental Risks & Controls

No works are permitted outside the red project boundary or within protected areas

Report all incidents and any complaints

Notify Environment Manager any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

SOIL AND WATER:

Hazardous substances must be stored correctly to prevent spills

ERSED controls to be installed as per this SEP and the Erosion and Sedimentation control plans (ESCP) and report damaged controls

No mud/ sediment to be tracked outside the site area

FLORA AND FAUNA

No vegetation to be impacted

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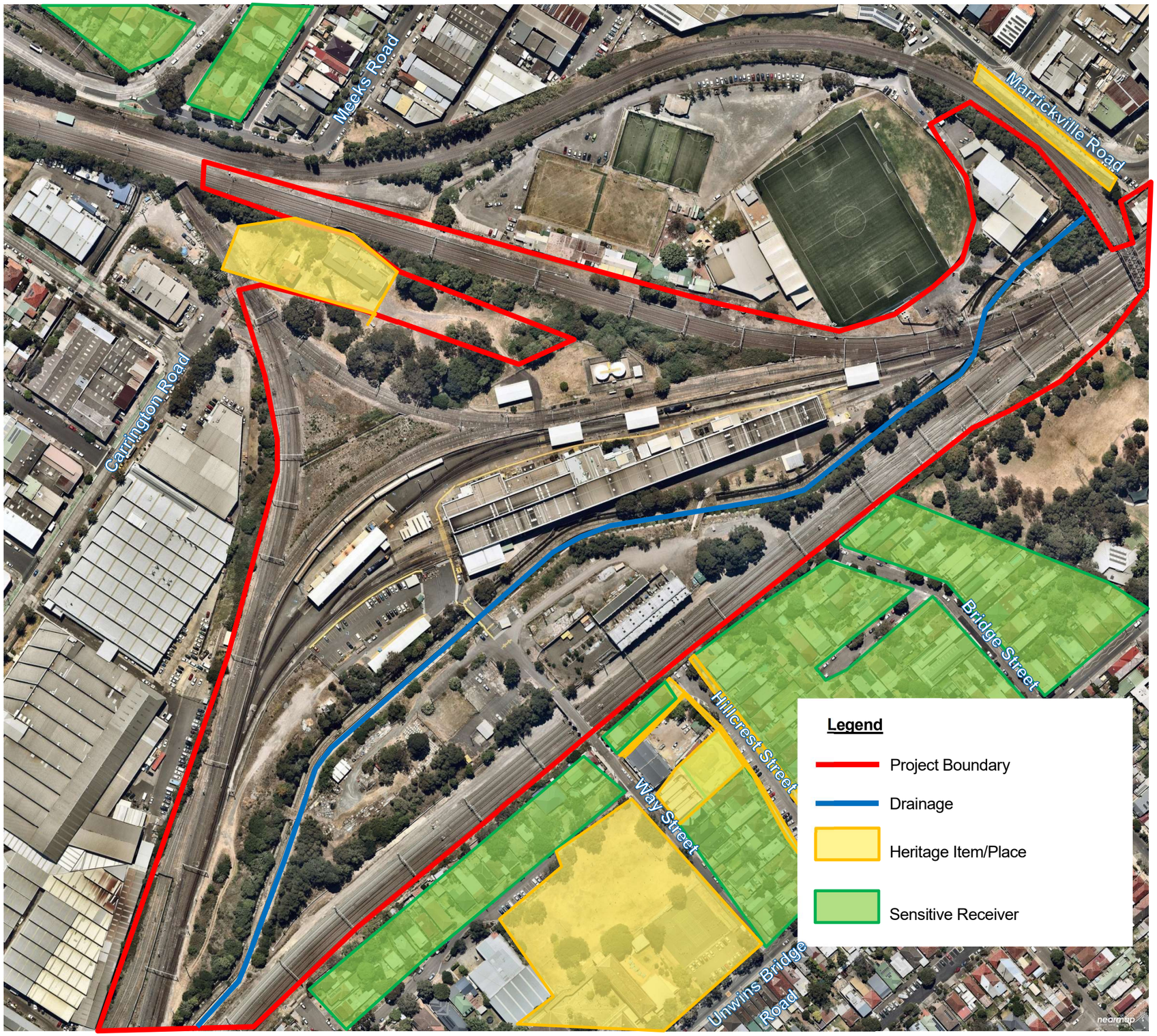
Laura Stewart	Stakeholder and Community Relations Manager	0455 092 638

Environmental Control Map

Sydenham Station and Junction – Southwest Portion



Key Environmental Risks & Controls

No works are permitted outside the red project boundary or within protected areas

Report all incidents and any complaints

Notify Environment Manager any unusual finds (odours, discoloured soil, asbestos, remains, suspected artefacts)

SOIL AND WATER:

Hazardous substances must be stored correctly to prevent spills

ERSED controls to be installed as per this SEP and the Erosion and Sedimentation control plans (ESCP) and report damaged controls

No mud/ sediment to be tracked outside the site area

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Place rubbish in appropriate bins, do not litter
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IMPORTING MATERIALS:

Obtain reports/ certificate for all imported material prior to delivery to site. The paperwork must be checked by the Environment Team to ensure it meets EPA requirements

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Dust suppression measures must be used to prevent impacting nearby residents and all loads must be covered

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Standard construction hours are 7am to 6pm M-F; 8am—1pm Sat – all Out of Hours Works are subject to approval in accordance with the Conditions of Approval and EPL

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High noise impact works only permitted 8am to 5pm M-F; 8am to 1pm

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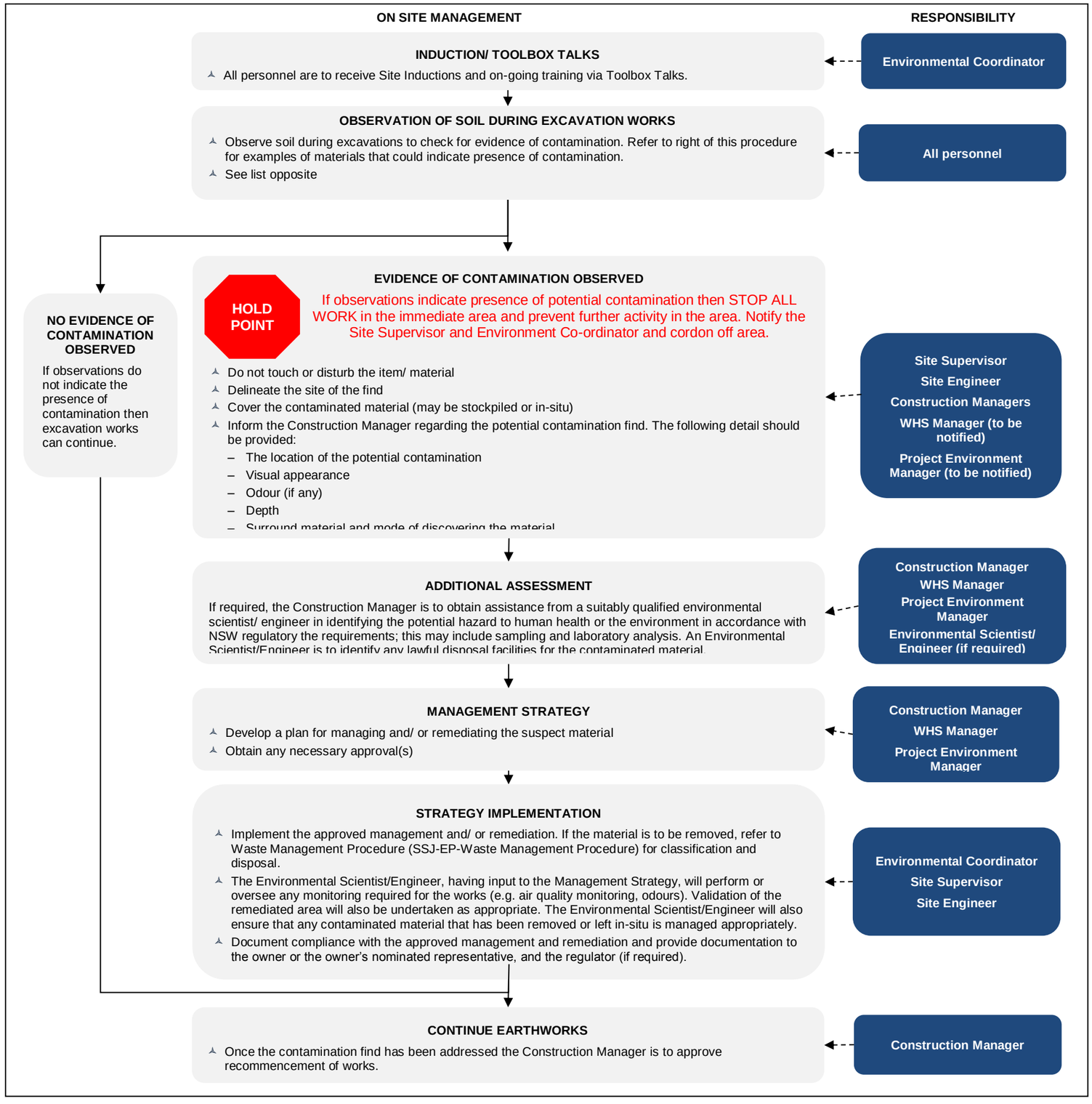
Laura Stewart	Stakeholder and Community Relations Manager	0455 092 638

Appendix 2: Cover Page

Environmental Management Documentation.

CONTAMINATION AND CONTINGENCY ACID SULFATE SOILS MANAGEMENT PROCEDURE



Indicators of Contamination

Examples of materials that could indicate the presence of contamination include (but are not necessarily limited to):

- Asbestos cement fragments or other potentially asbestos containing materials
- Odorous or stained soil;
- Buried chemical drums or containers
- High proportion of waste materials or building debris
- Tarry or ashy material
- Brightly or unusually coloured material
- A yellow and/or red mottling in the soil profile indicates there may be Acid Sulfate Soils (ASS)

Asbestos

Asbestos finds are to be managed in accordance with the Project WHS Management Plan

Acid Sulfate Soils (ASS)

ASS are naturally occurring soils, sediments or organic substrates that are formed under waterlogged conditions in coastal areas. When exposed to air after being disturbed, soils containing iron sulfides produce sulfuric acid and often release toxic quantities of iron, aluminium and heavy metals.

If ASS is encountered, possible management strategies include:

- Modifying the works to avoid the area of ASS
- Delineation and removal to a suitably licenced facility
- Onsite treatment to neutralise the ASS, which could include the application of lime.

Note: The management of any ASS needs to include appropriate erosion and sedimentation controls to minimise the potential for pollution to waters.

Management and Disposal of Contaminated Material

Specific approval may be required to implement management strategies and a Safe Work Methods Statement (SWMS) must be prepared prior to undertaking any remediation work, except in emergency situations.

Contaminated material will be disposed of in accordance with the Waste Management Procedure.

SYDENHAM STATION AND SYDNEY METRO TRAINS FACILITY SOUTH

Addendum to the Sydney Metro City & Southwest – Chatswood to Sydenham Historical Archaeological Assessment and Research Design

Report to Jacobs/Arcadis/RPS

January 2018

artefact

Artefact Heritage
ABN 73 144 973 526
Level 4, Building B
35 Saunders Street
Pyrmont NSW 2009
Australia

+61 2 9518 8411
office@artefact.net.au

CONTENTS

FIGURES

TABLES

1.0 INTRODUCTION

This addendum report constitutes an Archaeological Research Design (ARD) for the Sydenham Station and Sydney Metro Trains Facility South (the project as modified), a modification to Sydney Metro City & Southwest Chatswood to Sydenham project (the project as approved). This report has been prepared as an addendum to the ARD for the project as approved (Artefact 2016b).

1.1 Project Background

Planning approval for the project as approved was granted by the Minister for Planning under Part 5.1 of the *Environmental Planning and Assessment Act* (EP&A Act) on 9 January 2017. The modification area (study area) is located at the southern end of the Chatswood to Sydenham section of the approved project and includes:

- The southern services facility (for traction power supply and an operational water treatment plant) adjacent to the southern dive structure
- Sydenham Station and precinct works
- Track and rail system facilities
- Adjustments to the Sydenham Pit and Drainage Pumping Station
- Ancillary infrastructure and works.

Table 1-1: Key features of the modification

Component	Description of activities
Sydenham Station and precinct works	Demolition and reconstruction of platforms 1 and 2 for metro rail operations and a new aerial concourse connecting to new station entries at Railway Parade and Burrows Avenue. Upgrades to transport interchange facilities and provision for active transport would be delivered as part of the station works
Sydney Metro Trains Facility South	Construction and operation of train stabling and maintenance facilities for the overall metro network. The scope includes earthworks, retaining walls, track and rail systems, construction of new buildings, enabling works to support future rail corridor development above the facility, plus operation of trains and maintenance activities within the stabling yard
Track and rail system facilities	Reconfiguration of existing track and rail systems to segregate the T3 Bankstown Line and the Goods Line, installation of metro tracks and rail systems including crossover and turnback facilities
Adjustments to the Sydenham Pit and Drainage Pumping Station	Including a new aqueduct over the pit, new pumping station and new maintenance access ramp
Ancillary infrastructure and works	Including fencing, maintenance access, utilities works, drainage, noise barriers, road and transport network works, bridge works, and temporary facilities to support construction

1.2 Previous heritage assessments

This ARD is informed by previous heritage assessments prepared for the Metro project, which have assessed the archaeological potential and significance within the portions of the project as modified. These assessments are:

- Arcadis, 2017, *Chatswood to Sydenham: Sydenham Station and Sydney Metro Trains Facility South Modification Report*
- Artefact Heritage 2017, *Sydney Metro City & Southwest Sydenham to Bankstown Technical Paper 3 Non-Aboriginal Heritage Impact Assessment*
- Artefact Heritage, 2016a, *Sydney Metro City & Southwest – Chatswood to Sydenham Technical Paper 4 Non-Aboriginal Heritage Impact Assessment*
- Artefact Heritage 2016b, *Sydney Metro City & Southwest Chatswood to Sydenham – Historical Archaeological Assessment and Research Design*

Works within the eastern portion of the study area of the project as modified are included in the project as approved. The Southern Dive Site and adjacent works site were assessed in the project as approved Non-Aboriginal Heritage Impact Assessment (NAHIA) (Artefact 2016a). The NAHIA found that there was unlikely to be impacts to significant archaeology as a result of the project and management under an Unexpected Finds Procedure was recommended as appropriate mitigation.

> *Any potential archaeological resources within the study area would be impacted by substantial excavation works associated with the dive structure and tunnel portal. Although any impacts to potential archaeological resources within the study area would be substantial, the archaeological assessment did not identify any significant archaeological resources within the study area. (Artefact 2016a:247)*

The ARD for the project as approved included a management map for the Southern Dive Site and adjacent works site which showed the entire are as covered under the Unexpected Finds Procedure (Artefact 2016b: Figure 13-11).

1.3 Study area

The study area of the project as modified is illustrated in Figure 1-1 to Figure 1-4. This addendum ARD provides management measures for potential archaeological resources within the study area, as shown in Figure 1-2. The study area is located in the Inner West Local Government Area.

1.4 Statutory context

There are no statutory listed heritage items with identified archaeological values located within the study area. The following listed items are located within the study area and are significant for their built heritage values (Table 2). Built heritage is assessed in the modification report (Arcadis 2017).

Table 1-2: Listed items in the modification area

Listing	Suburb	Number	Significance
Sydenham pit and drainage pumping station 1	Sydenham	State SHR (01644) Sydney Water S. 170 Heritage and Conservation Register (4571743) Marrickville LEP 2011 (I81)	State
Sydenham Railway Station Group	Sydenham	SHR (No. 01254) RailCorp S.170 Heritage and Conservation Register (4801154) Marrickville LEP 2011 (I286)	State
Sydenham (Illawarra Line) underbridge	Sydenham	RailCorp S.170 Heritage and Conservation Register (4805746)	Local
Marrickville (Meek's Road) Railway Substation	Marrickville	RailCorp S.170 Heritage and Conservation Register (4801123)	Local

All four listed items within the study area are identified in their listing information or relevant Conservation Management Plans (CMPs) as having no, or low, non-Aboriginal archaeological potential.

1.5 Report Authorship

This report was prepared by Jenny Winnett (Senior Heritage Consultant) and Dr Sandra Wallace (Director).

Figure 1-1: Study area of the project as modified

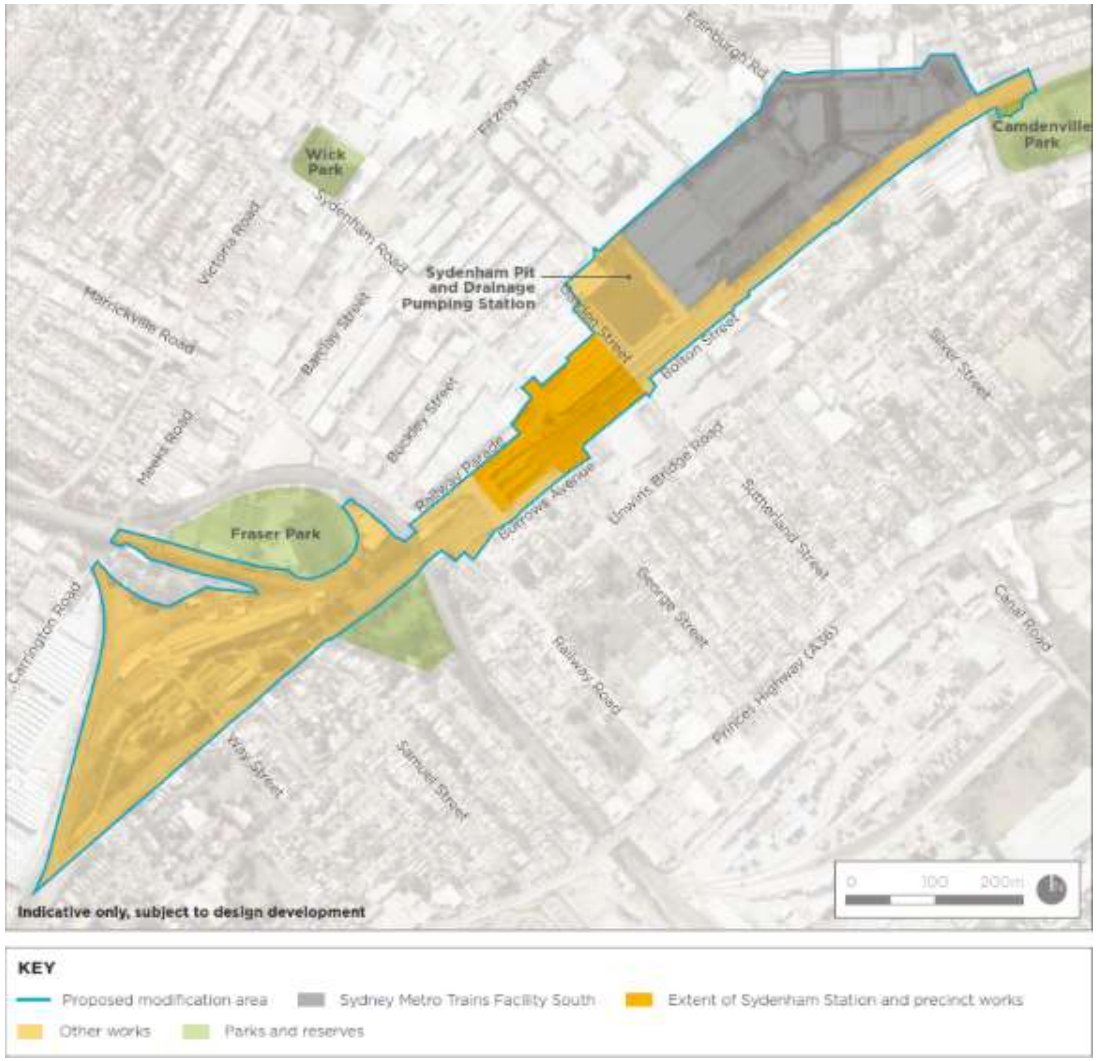
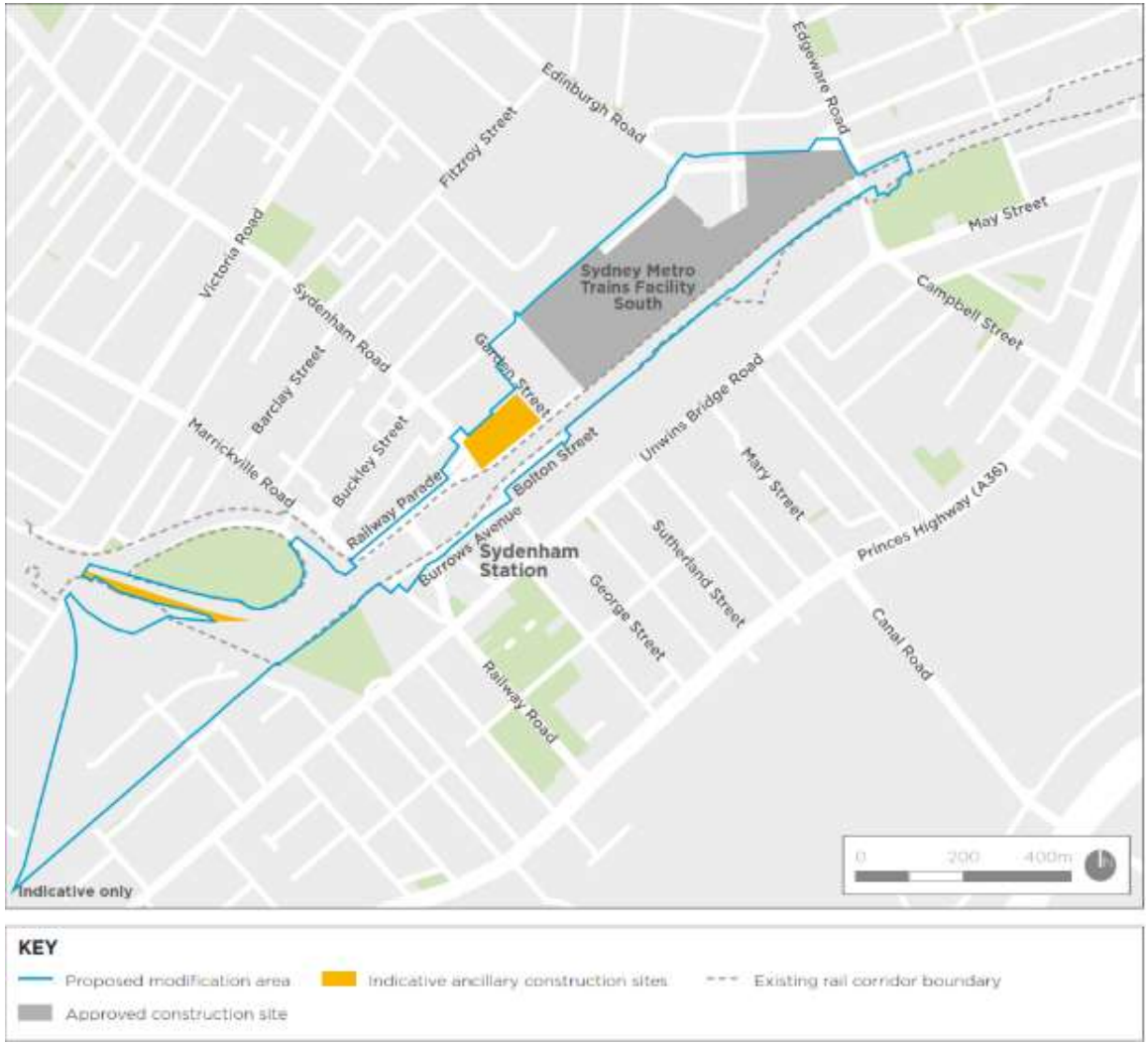


Figure 1-2: Key features of the Marrickville Dive Site and Southern Support Facility

Figure 1-3: Key features of the Sydenham station and precinct works

Figure 1-4: Construction sites



2.0 HISTORICAL CONTEXT

2.1 Introduction

Land in the Marrickville area was first granted to European settlers in the 1790s. Initially used for low intensity timber getting and agricultural activities, subdivision and establishment of various manufacturing industries, such as brickmaking, began in the 1830s. By the 1860s Marrickville had grown as a suburb with both residential and industrial development areas. Marginal swampy land, such as the study area, was slow to develop. During the early to mid-1900s the study area developed primarily as a location for industry and manufacturing, rather than residential subdivision (with some exceptions). The topography and development history influenced the subdivision pattern and land use throughout the twentieth century. The study area today remains predominately industrial in character surrounded by both residential and other industrial pockets.

2.1.1 Early land grants

Land grants were first issued in 1793 for farms and crop growing in the Marrickville area. By 1810 all the land in Marrickville was granted to settlers. In 1799, Thomas Moore received a grant of 470 acres adjoining the swamp and in 1803, a further grant of 700 acres. Moore also purchased adjoining land and by 1807 held 1,920 acres, making him one of the largest landowners in the area (Figure 8). His holdings incorporated much of present day Marrickville, Petersham, and Dulwich Hill. Douglas Farm, as Moore's holdings were named, was utilised for the growing of maize and wheat and for its valuable stands of timber. Moore was appointed Master Boat Builder in the dockyard at Port Jackson, and it is likely that some of the timber from the property went to his shipbuilding yard.

Moore sold his land holdings to Dr Robert Wardell on the 21st of July, 1830. At this time, the estate extended from Parramatta Road to Cooks River. Wardell was a flamboyant figure, hosting lavish parties at his home, Sara Dell (originally located on Parramatta Road in the vicinity of the Fort Street High School), and stocking his property with imported English deer for hunting. In September 1834, Wardell stumbled across the camp of three escaped convicts whilst riding along the Cooks River and was murdered. Wardell's estate was divided amongst his sisters, Anne Fisher, Margaret Fraser, and Jane Isabella Priddle. Wardell's death opened the way for the first era of subdivision in the area, and parts of his land began to be sold off soon after his death, creating small farms for orchards and dairy cattle, and new industries such as brickmaking. Most of the remaining land was scrub earning the name of 'Wardell's Bush'.

The western half of present-day Sydenham, including the area now occupied by Sydenham Station, was part of the Gumbramorra Swamp. During the 1830s and 1840s, the outer lying suburbs of Newtown, St Peters, Tempe, and Petersham became desirable locations for the construction of rural retreats, due to increasing land prices in the city.

By the 1840s, a track known as Swamp Road was established, now Sydenham Road. Unwin's Bridge Road was constructed by convict labour in 1836 for Frederick Wright Unwin, a prominent landowner south of the study area. During this phase, the area was occupied primarily by brickmakers, farms and stockmen utilised the swamp to water livestock.

The area to the north of the railway line was originally part of the extensive Petersham Estate, also referred to as the Sydenham Farms. This was subdivided, primarily into large agricultural lots, from the mid-19th century. A portion of the study area (including, and east, of Sydenham Railway Station) was included in Section No.1 of the subdivision c. 1850. The subdivision plan from the time indicates that much of the study area was low-lying at this time, and is shown as being marsh-land (Figure 2-2). The area today known as Fraser Park formed part of the area labelled as 'King's Garden' (Figure 2-2;

Figure 2-6). The areas was obviously suited to this use, as 'Meek's Garden' was also located to the north of the study area.

Figure 2-1: Undated plan of the Parish of Petersham, showing Thomas Moore's grant of 470 acres. The study area was located within this grant and also crossed into the small holdings of John Fincham and James Wain.

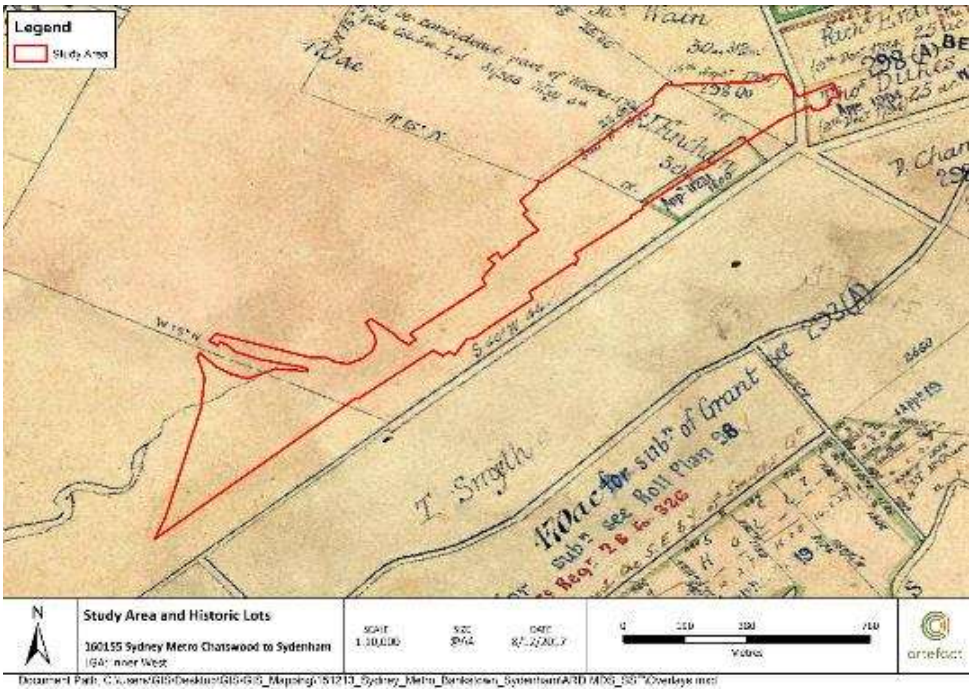


Figure 2-2: Detail of John Allan's plan showing the subdivision of the Petersham Estate, c. 1850. King's Garden is labelled. Source: NLA MAP F 178.

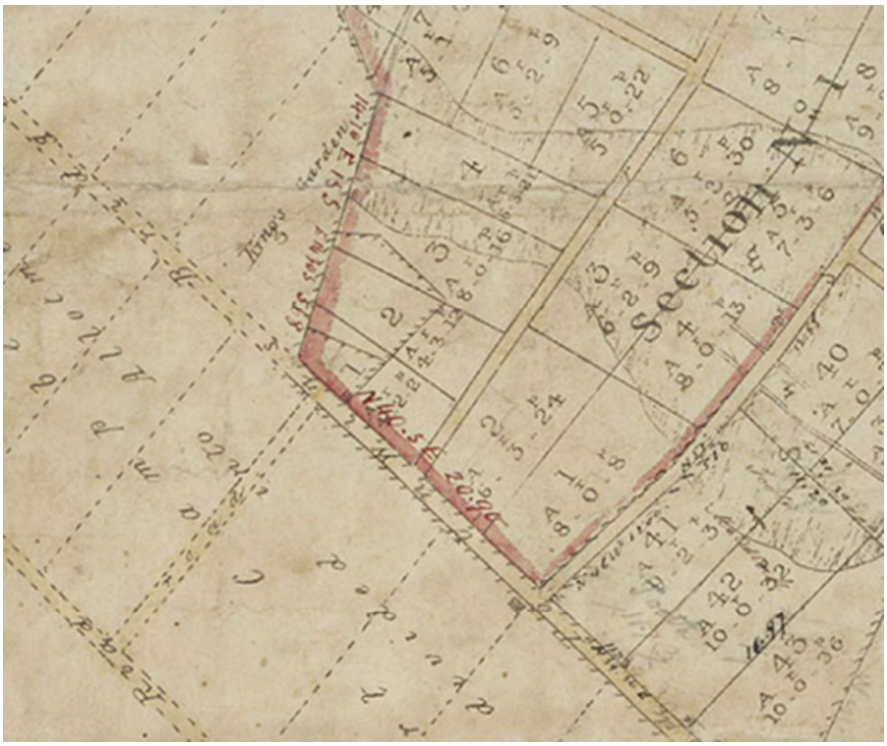
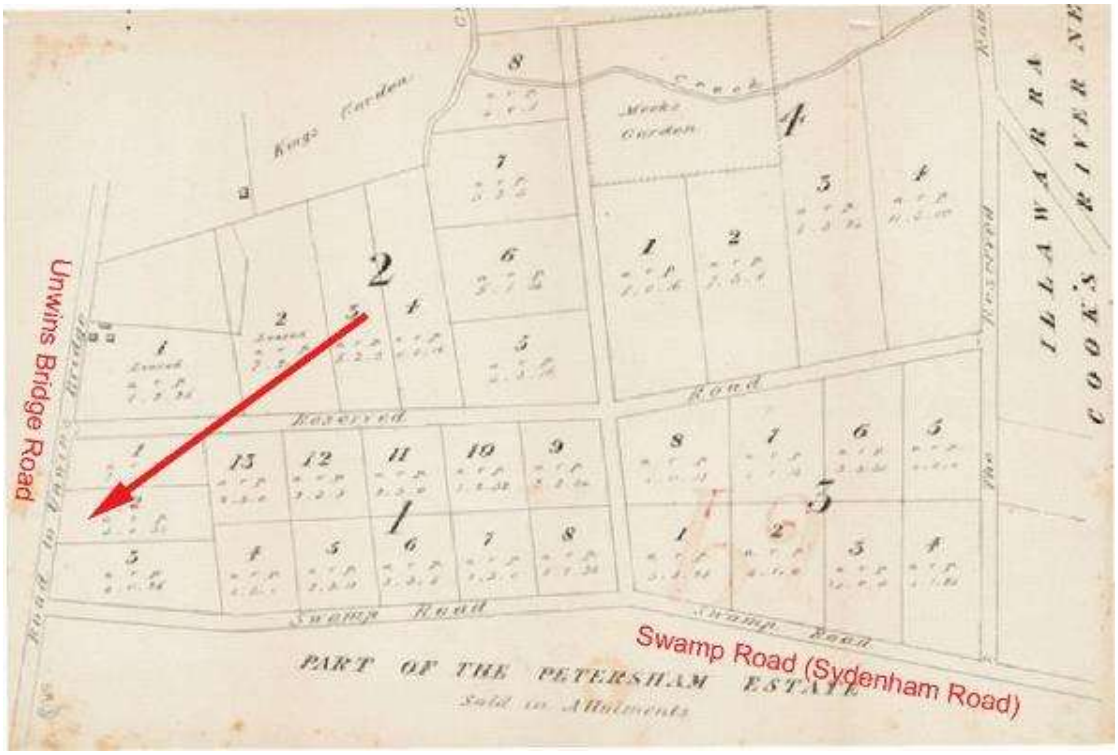


Figure 2-3: Detail from J. Allans plan of Sydenham Farms. Swam Road and Unwin's Bridge Road. The approximate location of Sydenham Station is arrowed. Plan no. 1 / J. Dating between 1840 and 1850. SLNSW M2 811.1826/1840/1.

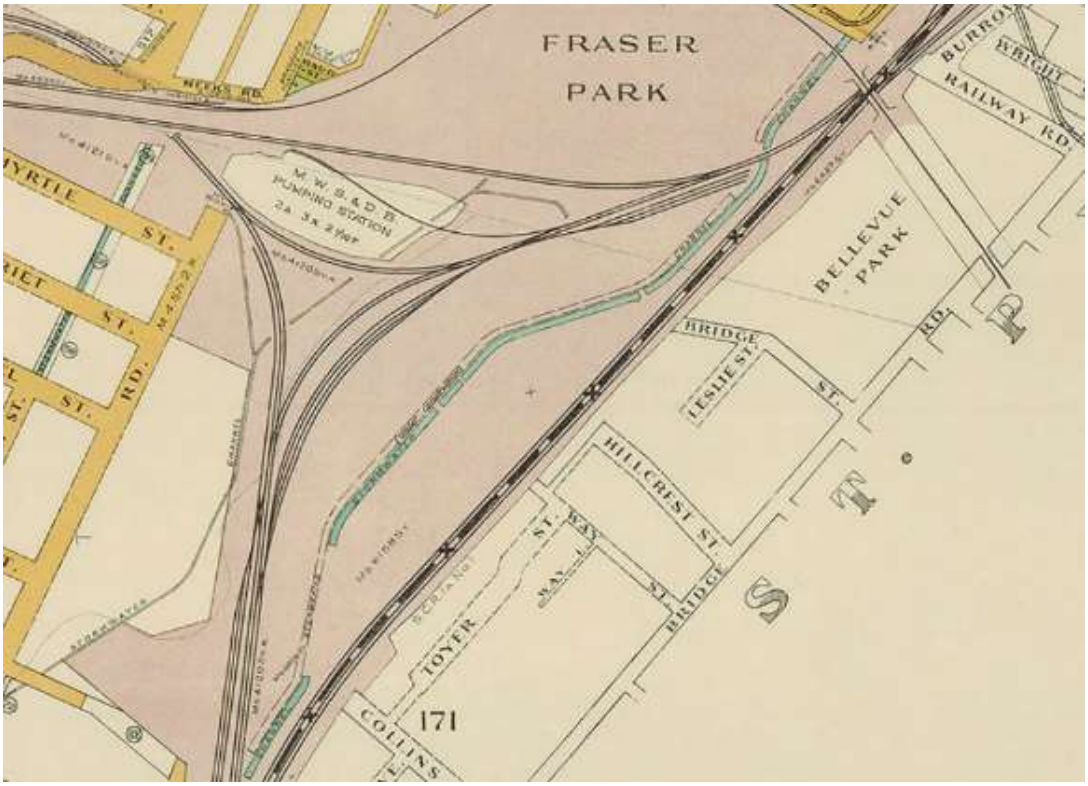


2.1.2 Subdivision and early industry

In the 1880s there was a Sydney wide population boom, resulting in mass residential and commercial development for the area. Steam trams were introduced and in 1881 a line ran from Newtown Bridge to Marrickville. This was designed to stimulate residential development within the area. The Tramvale subdivision in the western portion of Sydenham was offered for sale soon after, targeting working class families and offering close proximity to factories and employment opportunities. The estate was affected by regular flooding and poor drainage, and lacked basic sewerage facilities. Mosquitos were rampant in summer and its inhabitants suffered badly from a range of diseases. In May 1889, after several days of heavy rain, the Cooks River flooded and the areas surrounding Gumbramorra Swamp were soon inundated with water, including the Tramvale estate. Residents were rescued as their homes were severely flooded. The Tramvale estate was consequently abandoned, although the area continued to be used, primarily for industrial and agricultural purposes.

The Gumbramorra Swamp, and other low-lying areas within the district, were systematically drained from the late 1890s. This work was part of a broader scheme for waste water management for Sydney, creating useable land in out-lying districts for residential and industrial purposes. The Sewage Pumping Station 271 (described below) located in the south-west of the study area, and within the former swamp, was designed and built by the Public Works Department in 1889 as part of this broader program. This scheme included the construction of a number of brick and concrete drains, as well as a series of low level sewage pumping stations constructed to transport waste against gravity by means of a series of rising mains. During the early 20th century an open stormwater channel, and later a below-ground stormwater drain ('under construction' in 1917), passed though the Sydenham Triangle (Figure 2-4). In the 1930s the Sydenham Pit (described below) was constructed to deal with overflow from the system, discharging it into the Cooks River.

Figure 2-4: Detail from the c.1917 Municipality Maps Series. SLNSW.



The draining of the Swamp allowed for industrial businesses to utilise the land that was deemed unsuitable for residential development.[1] Industries included potteries, metal work, quarries, and food manufacturing. Brickmaking was still prominent in the area, with many of the former market farms converting their land to brick pits.[2] The proliferation of the brick business also witnessed the demolition of grand homes, and subdivision of the estates for cheap worker's accommodation was made.

Residential lots from the Smidmore subdivision, in the north-east of the study area, were auctioned in 1906 (Figure 2-7). It is likely that the majority of occupants were employed at the nearby factories and warehouses. The residences associated with the Smidmore subdivision are still present in 1943, prior to demolition in the late 20th century to make way for the present-day warehouses (Figure 2-5).

With the exception of the Smidmore Estate, the study area remained largely industrial in character throughout the early 20th century. By 1910 Marrickville and Sydenham were dominated by iron and woollen works, with residential development continuing in the remaining suitable open areas of land subdivision, mostly for the working class. Dairies were prominent along Edinburgh Road in 1911. Woollen mills, such as Vicars Woollen Mills which was founded in 1893, were located along Victoria Road.[3] James Steel Engineering was established in 1915 on Victoria Road. Malco Industries (formerly Malleable Castings Ltd), started in 1915 on Rich Street. The industry was so important to the people of Marrickville that they held annual exhibitions in the town hall.[4]

[1] Fox 1986, 29; Whitaker 2006, 6.
[2] Meader 2008
[3] Cashman & Meader 1990, 168.
[4] Meader 2008

Figure 2-5: The houses associated with the 1906 Smidmore estate are located between Edinburgh and Murray Streets. NSW Lands and Property Information, SIX Maps.

Figure 2-6: Fraser Park, Sydenham, c. 1947. Source: Marrickville Library & History Services.

Figure 2-7: The Smidmore subdivision, south of Edinburgh Road, is within the study area. NLA image 230293982.

2.1.3 Industrial consolidation

The 1929 Wall Street crash led to many of the industries within Australia, including Marrickville, being affected, with many workers left jobless.[5] Prior to World War Two the industrial area was consolidated in the low lying areas, but new growth began after the founding of new raw materials for iron and steel works.[6] Immigration increased after World War Two with the factories and warehouses providing jobs for unskilled workers with little English and cheaper accommodation.[7]

With increased road transport, industries were not relying as heavily on rail transport, resulting in many of the industries in the Marrickville area moving out cheaper sites. In the 1943s aerial, the study area was a mix of residential and light industry (Figure 2-5). By 1970s many of the larger industries within Marrickville had moved out of the Marrickville area, although smaller industries still continue to the present day.

2.1.3.1 Sydney Steel Company

In 1910, the Sydney Steel Company was established on a 22-acre site to the north of the rail line (within the Sydney Metro Trains Facility South Precinct boundary). This was a vast area of vacant land on the fringe of the city, adjacent to the main rail line and located between Sydenham and St Peters stations. Founded by Scottish migrant Alexander Stuart, the former Premier of NSW and Mayor of the former St Peters Council, the large factory was established on Edinburgh Road in Marrickville and supplied steel fabrication and distribution services to Sydney's expanding construction industry in the decades that followed (Figure 2-8).[8]

Figure 2-8: The main workshop at the Edinburgh Road Marrickville Sydney Steel Company factory, 1911. Source. Stuart 2012 *Sydney Steel: An Illustrated History of the Sydney Steel Company 1910-1979.*

With merchandising of steel having been an important part of the company's business for several decades, the stockyard was originally laid out at the rear of the main Edinburgh Road workshop in 1913 (Figure 2-9 and Figure 2-10). A steam operated crane was installed in this location to move the stock.

[5] Whitaker 2006, 13.
[6] Fox 1986, 30.
[7] Whitaker 2006, 13.
[8] Stuart, W. 2012. *Sydney Steel: An Illustrated History of the Sydney Steel Company 1910-1979*

Figure 2-9: Photograph of the stockyard at the rear of the Sydney Steel Company workshop, taken from the roof of the workshop looking south towards Sydenham Station, c1913. Source. Stuart 2012 *Sydney Steel: An Illustrated History of the Sydney Steel Company 1910-1979.*

Figure 2-10: Photograph of the stockyard at the rear of the Sydney Steel Company workshop, showing steam operated crane, c1913. Source. Stuart 2012 *Sydney Steel: An Illustrated History of the Sydney Steel Company 1910-1979.*

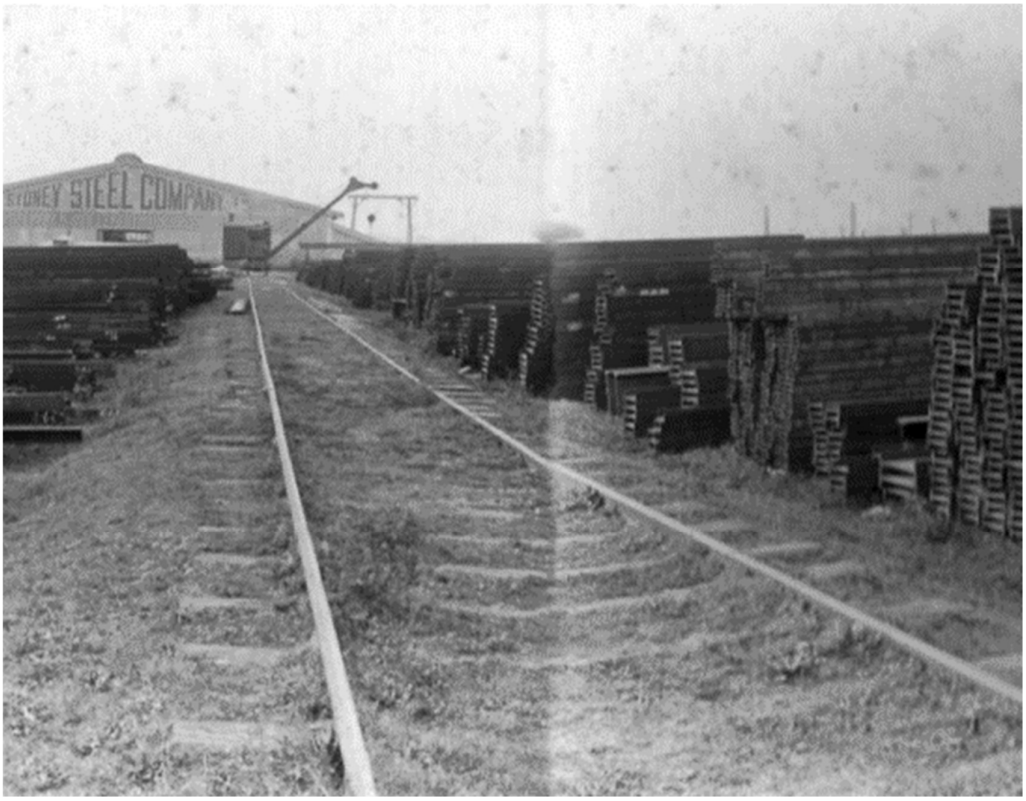


Figure 2-11: View of the Sydney Steel Company, Marrickville in 1919. A 44-tonne girder is seen being transported on a custom-made horse drawn limber to a rail siding near Sydenham Station. Source. Stuart 2012 *Sydney Steel: An Illustrated History of the Sydney Steel Company 1910-1979.*

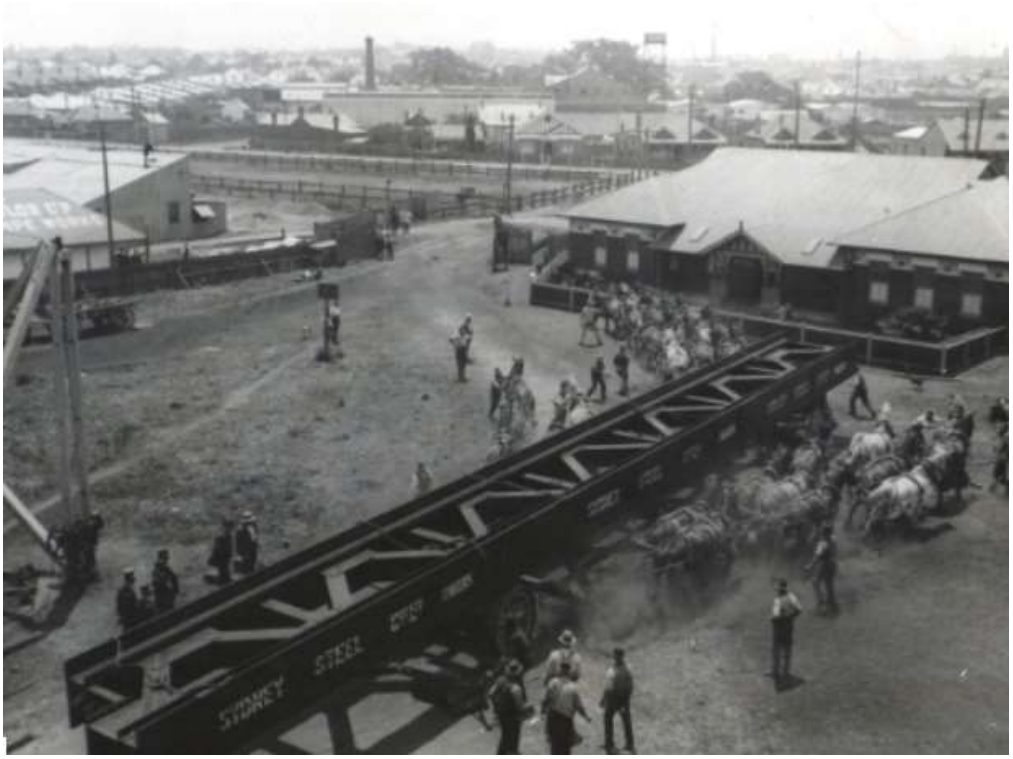


Figure 2-12: Employees at work outside Sydney Steel Company, Marrickville in 1922. The train line can be seen in the background. Source. Stuart 2012 *Sydney Steel: An Illustrated History of the Sydney Steel Company 1910-1979.*

The post-World War II building boom resulted in significant expansion of the fabrication area at Edinburg Road during the 1950s. The stockyard was relocated adjacent to the rail line, where a giant crane was assembled, and additional buildings were constructed on the vacant land. By 1960, half of the 22-acre site had been developed as covered fabrication area. Sydney Steel Company had, by this time, become one of the largest employers in the suburb of Marrickville.

The factory was responsible for producing steel used in the construction of landmark city structures including the Farmers (now Myer) and David Jones department stores, the AWA Building in York Street, the AMP Building at Circular Quay and the Wentworth Hotel in Phillip Street, Sydney Harbour Bridge, and iconic structures like the MA Noble Stand at the Sydney Cricket Ground and the 250 tonne Hammerhead Crane at Garden Island. [9]

Between 1973 and 1975, Sydney Steel Company relocated to the site of a smaller fabricator and reinforcing supplier located at Revesby. Following closure of the Sydney Steel Company at Marrickville, the site was redeveloped. In 1975, the rear of the site (approximately eight acres) was sold, and the remaining portion of the site was subsequently sold in 1976.

Figure 2-13: Photograph of the Sydney Steel Company in Marrickville in 1948. Source. Stuart 2012 *Sydney Steel: An Illustrated History of the Sydney Steel Company 1910-1979.*

[9] Stuart 2012

Figure 2-14: Photograph of the Sydney Steel Company in Marrickville in 1962, showing crane and buildings on land adjacent to railway line. Source. Stuart 2012 *Sydney Steel: An Illustrated History of the Sydney Steel Company 1910-1979.*

2.1.3.2 Sydenham Pit and Drainage Pumping Station

The Sydenham Storage Pit and Pumping Station was designed and built by the New South Wales Public Works Department between 1935 and 1941. The Sydenham Pit and Drainage Pumping Station 1 was constructed during the Great Depression immediately west of the steelworks and east of Garden Street. It remains at the site today and consists of a brick lined drainage pit designed to collect the overflow from stormwater drains in the area. The Eastern Canal is associated with the pit and extends into the study area.

2.1.3.3 Sewage Pumping Station 271

The Sewage Pumping Station 271 was designed and built by the Public Works Department in 1889 as part of a larger program of waste water management within Sydney. The complex consists of a combined boiler house and engine room, a large chimney stack and a residence. The pumping station/boiler house is designed in classic Federation Romanesque style. The residence is an unadorned two storey brick building designed in Federation Queen Anne style and the stack is a local landmark. The station and residence building are in good condition and the fabric is substantially intact. A series of low level sewage pumping stations were constructed to transport waste against gravity by means of a series of rising mains. The low-level portions of Marrickville, Newtown, Erskineville, Alexandria and St Peters are still serviced by a low level sewer which discharges into the wells of Marrickville Pumping Station. The sewage is then pumped to the high level of the Eastern Branch of the Southern and Western Suburbs Ocean Outfall Scheme (SWOOS). Marrickville SPS also receives stormwater discharge from the Central stormwater channel during certain high tides in the Cooks River.

2.1.3.4 Meeks Road substation

Marrickville Railway Substation was designed and built by NSW Government Railways in 1926. It is located facing south on to the Illawarra Line within the Sydenham Triangle. The site is accessed via

an overbridge via Way St to the south. The site includes the substation building, the switch house, transformers and surrounding electrical equipment.

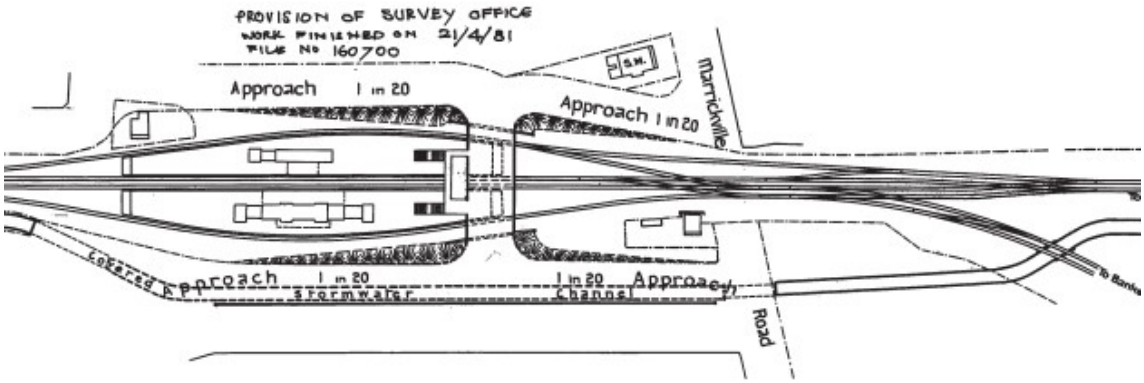
2.1.3.5 Sydenham Railway Station

Sydenham Station, originally named 'Marrickville Station', was constructed on the first section of the Illawarra Railway line in 1884 (Figure 2-16).[10] The station and associated buildings, including the station masters residence, were designed by the NSW Railways Department. The contract for the construction of the station was awarded to William Robinson in 1883.[11]

In 1895, following the construction of the present-day Marrickville Station on Illawarra Road, the station was renamed 'Sydenham'. The station originally comprised of two platforms with impressive and detailed platform buildings (Figure 2-15). The station was originally intended to serve the Marrickville township, but it was distant and surrounded by industrial and rural estates.[12] Consequently, whilst a number of small businesses were established in the area surrounding the station to serve local residents, Sydenham remained relatively underdeveloped in comparison to neighbouring Marrickville.

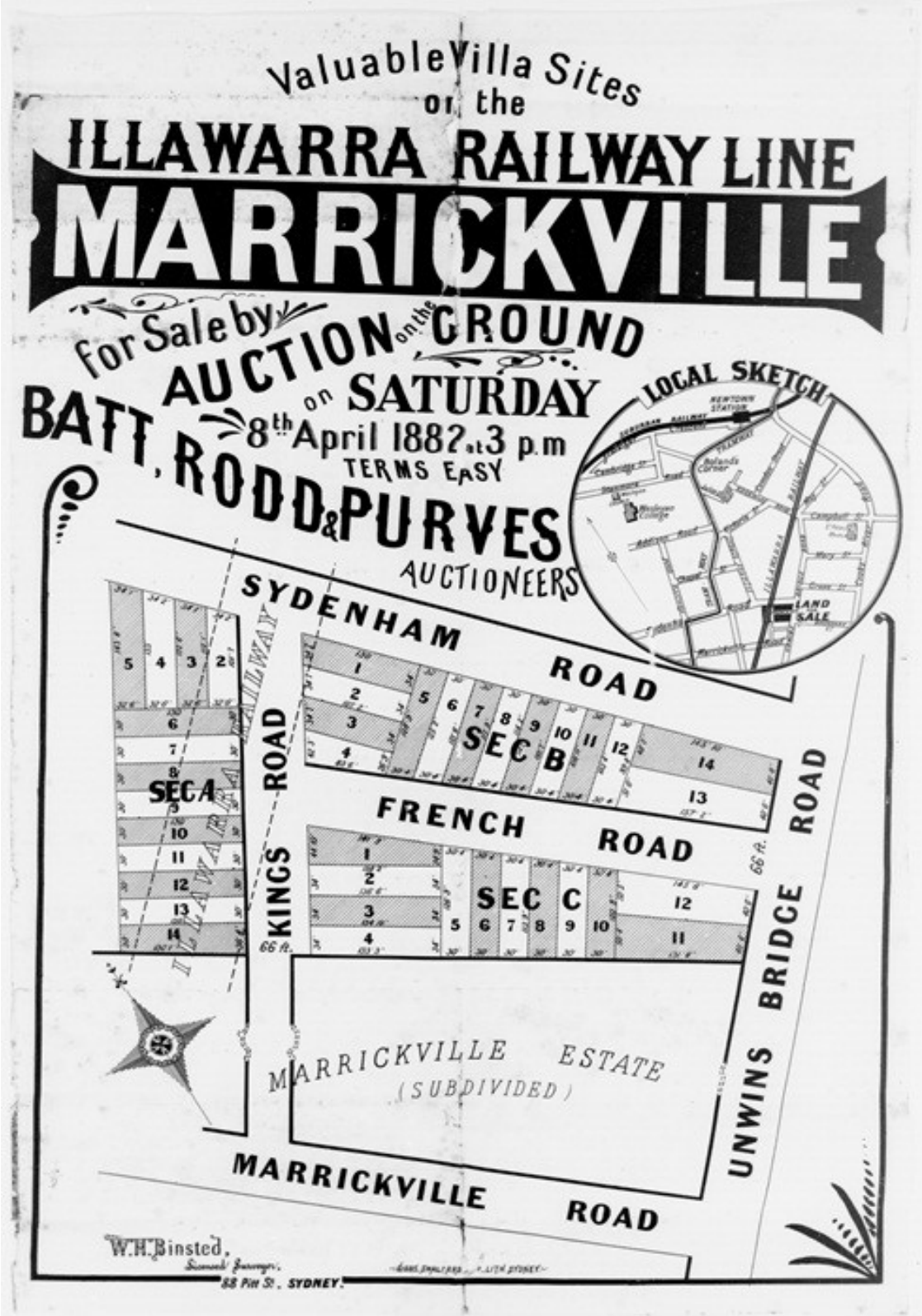
In 1909 the railway line was extended to Bankstown, and the line from Edgeware Road to Sydenham was quadruplicated. This required the extension of the platforms at Sydenham Station. The railway cutting was widened and the original platforms were transformed into island platforms, requiring the construction of an extended footbridge to allow access. The footbridge was constructed by Dorman Long & Co Ltd., the same company that would engineer the Sydney Harbour Bridge.[13] The lines were electrified in 1926.

Figure 2-15: 1881 Plan of Marrickville (Sydenham) Station, showing the platform configuration prior to the construction of the Bankstown line. Source: State Records NSW, images 17420_a014_a014_a014000815.



[10] State Heritage Inventory 'Sydenham Railway Station Group', NSW Heritage Branch, Office of Environment and Heritage, Parramatta NSW. Accessed 19 June 2016.
[11] Australian Town and Country Journal, 15 September 1883. Accessed via TROVE, 29 June 2016.
[12] State Heritage Inventory 'Sydenham Railway Station Group', NSW Heritage Branch, Office of Environment and Heritage, Parramatta NSW. Accessed 19 June 2016.
[13] *Ibid*.

Figure 2-16: Subdivision plan from 1882 indicating the location of the proposed Illawarra Railway corridor. Source: Marrickville Library & History Services.



3.0 ARCHAEOLOGICAL ASSESSMENT

3.1 Previous studies

David Scobie Architects Pty Ltd 2012. *Sydenham Railway Station. Heritage Impact Statement.* Prepared for Arenco (NSW) Pty Ltd.

A TAP upgrade of the station was conducted in 2012 with the removal of the 1980s overhead booking office and footbridge and provision of a new concourse, new lifts and stairs; new canopy structure; and new station building at overbridge level.

Sydney Water 2004. *Sydenham Pit & Drainage Pumping Station 1. Draft Conservation Management Plan.* Prepared for Sydney Water.

The CMP was commissioned by Sydney Water to provide a conservation and management framework for Sydenham Pit and DPS No.1. The report provides a contextual history of Sydney Water and the legislative background to the management of heritage assets, as well as an assessment of significance and conservation policies specific to the site. The CMP was consulted to understand the elements that constitute the significance of the site and how these would be affected by the project. The project was assessed against the relevant conservation policies of the CMP. The CMP is a draft report which was not endorsed by the Heritage Council.

The CMP did not identify archaeological potential for the item.

> *Historical evidence suggests that the site was probably once used for crop growing or livestock grazing purposes. The land was resumed from Sydney Steel Co. to make way for the construction of the pit. As the land was excavated, to make way for Sydenham Pit, it is unlikely that the area would contain potential historical archaeology. There is a potential that the site contains evidence of the construction activities for the pit; i.e. tools, materials, but if this existed it would be most likely contained beneath the Pit base and walls. (Page 77)*

Sydney Water 2005. Sewage Pumping Station SP0271. Conservation Management Plan. Prepared for Sydney Water.

The CMP was commissioned by Sydney Water to provide a conservation and management framework for the Sewage Pumping Station SP0271. The CMP outlines the history of the site and identifies the item as having historical and aesthetic significance as a landmark item with important architectural values. No archaeological values are identified. The CMP was endorsed by the Heritage Council in 2005 with an expiry of 2010.

The CMP did not identify archaeological potential for the item.

> *There is no evidence to suggest the likelihood of any physical remains of any other activity than these typical uses of the item and the site. There is thus only a limited potential for the survival of historical archaeological remains ('relics', under the NSW Heritage Act 1977). Any surviving remains are likely to be fragmentary and disturbed by later uses and services in this area of the site. Their potential to provide additional information regarding the history of the site is likely to be limited. (Page 82)*

3.2 Land use summary

The historical development of the study area can be divided into the following phases of activity:

- Phase 1 (1799 – 1840s) early land grants: Gumbramorra Swamp, large residential estates, farms and rural retreats.
- Phase 2 (1840s – 1880) scattered residential and industrial settlement: Swamp Road (now Sydenham Road) established, farms, brickmakers and stockmen utilise swamp.
- Phase 3 (1880 – 1909) arrival of the tramway, railway, residential subdivisions and scattered industrial settlement: Establishment of the Smidmore Estate, Gumbramorra Swamp systematically drained, railway arrives in 1895.
- Phase 4 (1909 – present) rail line extension, Sydenham Pit and Pumping Station and associated drainage channels, Meeks Road substation, Sewage Pumping Station SP0271 and Sydney Steel Company established, line from Edgeware Road to Sydenham quadruplicated, railway cutting widened.

Construction of the railway station and rail line in the late nineteenth and early twentieth century would have included a considerable amount of ground disturbance and excavation. Rail corridor upgrades throughout the twentieth century and the construction of the Sydenham Pit and Pumping Station and surrounding warehouses would have resulted in high levels of subsurface impacts throughout the area.

3.3 Potential archaeological remains

3.3.1 Phase 1 (1788 – 1840s)

There is no evidence of structures located within the study area during this phase. Archaeological remains associated with early agricultural land use near marginal swamp land may include tree boles, field drains, fence line postholes, imported garden soils and isolated refuse deposits/rubbish pits. The likelihood of remains from this period surviving is low.

3.3.2 Phase 2 (1840s – 1880s)

There is no documentary evidence of specific industrial activities taking place within the study area during this phase. Structures associated with King's Garden, in the south-west of the study area, were located further south, on Unwin's Bridge Road. Archaeological remains associated with grazing and land drainage, such as fence line postholes, drainage channels, land fill, and isolated artefacts from this phase, if present, are likely to have been disturbed by later construction works. The likelihood of remains from this period surviving is low.

3.3.3 Phase 3 (1880s – 1909)

There is low to moderate potential for archaeological remains associated with the early phase of railway infrastructure such as ceramic and wooden service pipes, brick drainage pits, electrical conduits and pits, stanchion bases, sleepers and rail track to be located within the rail corridor on the south eastern side of the study area.

The study area has low-moderate potential to contain archaeological remains associated with the draining of the swampland commencing in the late 19th century. Evidence of this drainage scheme may include subsurface brick, concrete and terracotta drains and former land-drains (likely concrete or similar). As these drains continued to be used into the 20th century (and may possible still be in use), they are unlikely to contain intact soil deposits with research potential. There is low potential that artefactual remains associated with the construction of the drainage system remain within the drain cuts and backfilled soils.

3.3.4 Phase 4 (1909 – present)

Archaeological remains associated with rail line upgrades such as utilities and drainage may be present but as the rail line has undergone maintenance and upgrades, any remains are likely to be fragmentary and no longer in situ.

The location of the Sydney Steel Company and yards have been subject to development of warehouses and infrastructure since its decommissioning. Manufacturing would have largely occurred in the factory itself which was constructed on a slab. It is therefore unlikely evidence of the manufacturing process or workers would remain. Archaeological remains in the yard section of the factory are likely to have been impacted by previous development, and would largely have consisted of incidental remains such as offcuts which may not have survived. There is a low potential that remains of crane footings, the steam crane tracks in the rear yard, or footings of other structures may remain beneath the existing warehouse slabs. The steam crane track was elevated on fill therefore it is probable it was removed during levelling in preparation for the construction of existing warehouses.. Any remains are more likely to be in the northern section of the Sydney Steel Company site as the southern section vacant until around 1950 and was not the focus of the operation.

There is moderate evidence that remains associated with the former Smidmore Estate may remain in the north-eastern portion of the study area, below the present-day warehouses. Remains are likely to be typical of those associated with early to mid-20th century residential development, including brick and concrete footings and remnant floor treatments. Artefacts and occupation deposits are rarely found in structures of this date. There is some potential for rubbish pits and other domestic refuse deposits (yard scatters, outhouses) to be located in the rear yards of the properties. This potential, however, is low, due to the introduction of municipal rubbish collection and sewage services in the 1880s.

3.4 Summary of archaeological potential

Previous assessments have provided historic context and a description of archaeological potential in the study area. A summary of the archaeological potential and significance of those remains is provided in Table 3-1.

Table 3-1: Summary of potential archaeological resources and significance

Phase	Likely archaeological remains	Potential
1 (1788 – 1840s)	• No documentary evidence of specific activities or development with the site • Archaeological remains associated with low intensity land use associated with early agricultural use may include tree boles, field drains, fence line postholes, imported garden soils and isolated artefact scatters.	Nil-low

Phase	Likely archaeological remains	Potential
2 (1840s – 1880s)	• No documentary evidence of specific industrial activities within the site • Archaeological remains associated with low intensity land use associated with early agricultural use may include tree boles, field drains, fence line postholes, imported garden soils and isolated artefact scatters.	Nil-low
3 (1880s – 1909)	• Archaeological remains associated with the early phase of railway infrastructure and the development of Sydenham Station, such as ceramic and wooden service pipes, brick drainage pits, electrical conduits and pits, stanchion bases, sleepers and rail track • Archaeological remains associated with the late 1890s drainage program including drainage associated with the SWOSS and Marrickville Sewerage Pumping Station may include subsurface brick, concrete and terracotta drains and former land-drains. Low potential for artefactual remains.	Low-moderate
4 (1909 – present)	• Archaeological remains associated with rail line upgrades such as utilities and drainage and structural remains associated with former warehouses • Low potential for remains associated with the Sydney Steel Company, such as building and/or crane footings, steam crane and line, offcuts, refuse from manufacturing processes. These would most likely be present on the northern section of the former Sydney Steel Company site. • Remains associated with the Smidmore Estate residential subdivision may include footings. Low potential for artefactual remains. These remains are unlikely to reach the threshold of local significance.	Low-Moderate

3.5 Archaeological significance

The previous reporting provided the following assessment of significance for the archaeology of the study area:

Table 3-2: Assessment of archaeological significance for Sydney Metro Trains Facility South Precinct

Criteria	Discussion
Research potential	• It is highly unlikely that archaeological remains associated with Phase 1 and Phase 2 would be present within the site and they are unlikely to have research potential • Potential archaeological remains associated with the Sydney Steel Company site may give insight into early 20th century industrial development, manufacturing techniques and structural layouts. Archaeological remains associated with Phase 4 may have local significance under this criterion.
Association with individuals, events or groups of historical importance	• The development of the rail network facilitated economic development and suburban growth in Sydney in the latter half of the nineteenth and early twentieth centuries. The Illawarra line was constructed in 1881 and was extended to accommodate the Bankstown line between (1895-1939). The potential Phase 3 archaeological remains are associated with the historical development of the Illawarra and Bankstown rail lines • The potential archaeological Phase 4 remains associated with the Sydney Steel Company site are associated with Alexander Stuart, who was a Scottish-born merchant and politician who became Premier of New South Wales in 1883. The factory produced steel for the Sydney Harbour Bridge, numerous landmark buildings in Sydney and iconic structures including the Garden Island

Criteria	Discussion
	Hammerhead Crane. It was also one of the first major factories constructed after the Gumbramorra Swamp was drained. Archaeological remains associated with Phases 3 and 4 may have local significance under this criterion.
Aesthetic or technical significance	• The potential archaeological remains from Phase 1 and 2 are not likely to have aesthetic value • The remains of Phase 3 former rail infrastructure may demonstrate changes in technology and rail engineering over time. However, they are not expected to demonstrate technical significance • Evidence of the Phase 3 swamp drainage, and associated works, would have technical significance • Any remains of Phase 4 steel works structures and rail infrastructure may demonstrate changes in technology and rail engineering over time. Archaeological remains associated with Phases 3 and 4 may have local significance under this criterion.
Ability to demonstrate the past through archaeological remains	• The potential archaeological remains are not considered to have the ability to illustrate the historical development of the surrounding area.

4.0 ARCHAEOLOGICAL MANAGEMENT

4.1 Summary of Archaeological Impacts and Management

A summary of impacts and the recommended archaeological management strategies are show in Table 4-1.

Table 4-1: Archaeological impacts and management strategies in the study area

Potential archaeological resource	Significance	Archaeological potential	Proposed impact	Archaeological Management
Phase 1 (1788 – 1840s)	Unlikely to reach threshold of local significance	Nil-Low	• Enabling works • Site preparation • Support operations • Facilities construction	• Unexpected Finds Procedure
Phase 2 (1840s – 1880s)	Unlikely to reach threshold of local significance	Nil-Low	• Enabling works • Site preparation • Support operations • Facilities construction	• Unexpected Finds Procedure
Phase 3 (1880s – 1909)	Local (Development of the railway and swamp drainage)	Low- Moderate	• Enabling works • Site preparation • Support operations • Facilities construction	• Unexpected Finds Procedure
Phase 4 (1909 – present)	Local (Sydney Steel Company)	Low – moderate for rail line and Smidmore Estate, low for Sydney Steel Company	• Enabling works • Site preparation • Support operations • Facilities construction	• Unexpected Finds Procedure

4.2 Research Design

4.2.1 Historic themes

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

Table 4-2: Historic themes for study area

Australian theme	NSW theme	Explanatory Notes	Comments
3. Developing local, regional and national economies	Agriculture	Activities relating to the cultivation and rearing of plant and animal species, usually for commercial purposes, can include aquaculture	The acquisition and use of the land by Thomas Moore and later Dr Robert Wardell was notable in the early history of Sydney for its size.
3. Developing local, regional and national economies	Industry	Activities associated with the manufacture, production and distribution of goods	The Sydney Steel company was associated with Alexander Stuart, the former Premier of NSW and Mayor of the former St Peters Council. The company was responsible for producing steel used in the construction of the Sydney Dental Hospital, the Sydney Morning Herald building, Qantas building, Sydney harbour Bridge, and Sydney Cricket Ground.
3. Developing local, regional and national economies	Transport	Activities associated with the moving of people and goods from one place to another, and systems for the provision of such movements	The corridor which the study area partially encroaches into has been a rail corridor since 1881 and undergone periodic improvements.
4. Building settlements, towns and cities	Utilities	Activities associated with the provision of services, especially on a communal basis	The study are contains Sydenham Pit, which is an item of State significance with high technical values.
9. Marking the phases of life	Persons	Activities of, and associations with, identifiable individuals, families and communal groups	The study area sits partly on land owned and exploited by Thomas Moore, Dr Robert Wardell, and Alexander Stuart.

4.2.2 Research questions

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

- Is there remaining evidence of land use practices associated with early 18th century farming on the edges of marginal swamps and if so, how is this expressed in the archaeological record?
- Are any expressions of early rural use similar to, or noticeably different from other similar sites near Sydney?
- Were the smaller rural holdings on the edges of Moore's land occupied by their owners, such as John Fincham or James Waine?
- Are the industrial process of the Sydney Steel Company interpretable within the archaeological record?

- Can the spatial layout of the Sydney Steel Company's operations be discerned within the archaeological record?
- Are successive phases of railway development present within the archaeological record?
- If successive phases of railway development are present in the archaeological record, are they able to provide insight into changing rail technology or utilisation of utilities associated with rail corridors in Sydney?

4.3 Archaeological Management

The study area would be managed under the Metro Unexpected Finds Procedure.

There is a nil-low potential for remains associated with Phases 1 and 2 (low intensity land use and development) to be impacted. If remains exist their location is not predictable, therefore the unexpected finds procedure is appropriate and in adherence to the archaeological management framework outlined in the project ARD (Artefact 2016b).

There is a low-moderate potential for remains associated with the infill of the Gumbramorra Swamp and construction of the early rail line to be impacted by the project. As the location of any intact deposits from Phase 3 is difficult to predict, and remains are likely to be dispersed the unexpected finds procedure is appropriate and in adherence to the archaeological management framework outlined in the project ARD (Artefact 2016b).

There is a low-moderate potential that Phase 4 remains associated with the development of the rail line and Smidmore Estate would be located within the modification area. It is unlikely these remains would reach the threshold of local significance. There is a low potential that locally significant remains of the Sydney Steel Company would be present. The archaeological management framework outlined in the project ARD states that areas with low potential for locally significant archaeology would be managed under the unexpected finds procedure.

4.3.1 Unexpected Finds Procedure

Unexpected archaeological finds would be managed under the Sydney Metro Unexpected Heritage Finds Procedure.

4.3.2 Heritage induction

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

4.3.3 Further archaeological investigation

If significant archaeological remains are identified as an unexpected find, an Archaeological Work Method Statement (AMS) would be prepared and recommendations would be made on appropriate archaeological management.

The project ARD (Artefact 2016b) outlines the appropriate methodology for archaeological investigation and reporting. This methodology would be followed under the modification.

4.3.4 Excavation director

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

5.0 REFERENCES

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Appendix 3: Cover Page

Community Notification.

Bondi Junction to Sydenham improvement works

From Thursday 29 March to Tuesday 3 April.

What we're doing

Sydney Trains is undertaking maintenance work between Bondi Junction and Sydenham from Thursday 29 March to Tuesday 3 April.

Transport for NSW is working on early investigations and survey works for Sydenham Station and Junction.

Sydney Trains is working on:

- resleepering works
- power supply upgrade works
- routine civil, track, signal and electrical maintenance
- litter and graffiti removal
- vegetation maintenance

We understand that this work will have an impact on you and your neighbours. We appreciate your patience and understanding.

To find out whether buses will replace trains during this work, please call 131500 or check *Upcoming Trackwork* on the transportnsw.info website.

Contact us

For project information
transport.nsw.gov.au/sydneytrains/community/maintenance

To report environmental concerns (24 hours)
1300 656 999

How this affects you

Noise

- These works may create additional noise at night. We apologise for the inconvenience this may cause.
- **Work will take place around the clock from 10pm Thursday 29 March until 4am Tuesday 3 April.**
- Equipment may be delivered to the worksite outside of this time.
- Due to travel restrictions on large vehicles, some of these deliveries may need to take place at night.
- Please note diesel work trains will be kept on site and may be idling for extended periods.
- Finishing works may take place following this period, including the removal of equipment.

Traffic and parking

- Heavy vehicles will be using local streets to access parts of the rail corridor.
- While we will park our vehicles inside the rail corridor wherever possible, please be aware that on-street parking may be limited near worksites.
- We apologise for any inconvenience and thank you for your cooperation and patience during these essential works.

Appendix 4: Cover Page

Environmental Representative Supporting Letter.