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:	METRON T2M
Project:	Southwest Metro Design Services (SMDS)
Application Title: (e.g. Smith St trenching works)	Track Slab and Intrusive Platform Investigations during possession weekend 17
Application Number:	SMDS-PCMW-014
Application Date:	Rev00:02.10.2020 Rev01:18.10.2020 Rev02:20.10.2020
Planning Approval:	• Sydney Metro City and Southwest – Sydenham to Bankstown – Environmental Impact Statement (EIS) • Sydney Metro City and Southwest – Sydenham to Bankstown – Submissions and Preferred Infrastructure Report (SPIR) • Sydney Metro City and Southwest Infrastructure Approval SSI-8256
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 investigation works (including potholing survey works, borehole drilling and test-pit 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: Will the proposed works affect or have the potential to affect heritage	*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'.*

items, threatened species, populations or endangered ecological communities?

Heritage

A heritage impact assessment (HIA) of the proposed works was undertaken by Artefact Heritage on 28 August 2020 (refer to Appendix 5 – *Sydney Metro City and Southwest Design – Heritage Impact Assessment (HIA) for investigative excavation works).*

Consultation was conducted with Department of Premier and Cabinet (DPC) Heritage in August 2020 for the proposed works. The DPC Heritage reviewed the HIA relevant for the proposed works (refer to Appendix 5) and expressed no objection to the proposed 'low impact' investigation works (refer to Appendix 6 – *Consultation with DPC Heritage.*

Subsequent to consultation with DPC Heritage, an addendum HIA was prepared to assess any additional impacts to heritage resulting from a minor revision to the location of several boreholes. The Addendum HIA, provided as Appendix 5 was issued to DPC Heritage on 16 October 2020 (refer to Appendix 6).

The proposed works will be undertaken within the curtilages as shown in the Environmental Control Maps in Appendix 1.The following heritage items listed on statutory heritage inventory registers are identified within vicinity of the proposed works:

Item	Significance	Listing
Marrickville Station Group	State	• State Heritage Register (SHR# 01186) • RailCorp s.170 heritage Inventory and Conservation Register (SHI# 4801091) • Marrickville Local Environment LEP 2011, (LEP# I89)
Dulwich Hill Station Group	Local	• RailCorp s170 Heritage and Conservation Register (SHI# 4801909)
Hurlstone Park Station Group	Local	• RailCorp s170 Heritage and Conservation Register (SHI# 4802051) • Canterbury Local Environment (LEP) 2012, (LEP# I124)
Canterbury Station Group	State	• State Heritage Register (SHR# 01109) • RailCorp s170 Heritage and Conservation Register (SHI# 4801100) • Canterbury Local Environment (LEP) 2012, (LEP# I67)
Campsie Station Group	Local	• RailCorp s170 Heritage and Conservation Register (SHI# 4801101) • Canterbury Local Environment (LEP) 2012, (LEP# I40)

Belmore Station Group	State	• State Heritage Register (SHR# 01081) • RailCorp s170 Heritage and Conservation Register (SHI# 4801084) • Canterbury Local Environment (LEP) 2012, (LEP# I11)
Lakemba Station Group	Local	• RailCorp s170 Heritage and Conservation Register (SHI# 4801916) • Canterbury Local Environment (LEP) 2012, (LEP# I143)
Punchbowl Station Group	Local	• RailCorp s170 Heritage and Conservation Register (SHR# 4802009) • Canterbury Local Environment (LEP) 2012, (LEP# I155)

The proposed works would be conducted in accordance with the mitigation measures outlined in the HIA and addendum HIA provided in Appendix 5, which includes implementation of an Archaeological Method Statement (AMS) involving archaeological monitoring and salvage at, and within, proximity to several stations, including Marrickville, Canterbury, Belmore and Lakemba. Metron T2M will implement the Sydney Metro Unexpected Finds Procedure V2.0 for the entirety of the proposed works (refer to Appendix 2 for an abbreviated procedure for the purposes of the site investigations team).

Biodiversity

The proposed works are not located in areas of threatened species, populations or endangered ecological communities as shown in the ECR Map provided in - Appendix 1. No vegetation disturbance or clearing is required for any aspect of the works.

Part 2: Details

Describe the proposed Minor Works:

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

Site Description Overview

The proposed works will occur within and surrounding all stations included under the Sydney Metro Design Services (SMDS) scope of works, with the exception of Wiley Park and Bankstown. All works will aim to be undertaken during the Weekend 17 possession, however some items of works may be undertaken during a later, non-possession date during standard working hours if possible.

The proposed works, shown within Environmental Control Maps in Appendix 1, are adjacent to both residential and commercial land uses and do not overlap with any vegetated areas (Appendix 1). Further detail on these areas and working methodologies is provided in the following section.

Description of Works

All works outlined within this Minor Works Application will be undertaken within areas delineated in Appendix 1, the HIA (Appendix 5) and addendum HIA (Appendix 6).

The works have been programmed with work teams working at each station simultaneously across two weekend daytime shifts. Investigations have been split into three (3) discrete activities, outlined below. Work methodologies corresponding to each of the three activities are outlined in the following section.

1. Track Slab Geotechnical and Utilities Investigations

Geotechnical and utilities investigations along station track areas (at all stations except Wiley Park and Bankstown) to understand subgrade conditions to inform future track slab design. The works involve:

Geotechnical Investigation

- Up to 76 test pit excavations using non-destructive digging (NDD)/vacuum truck to a depth of approximately 1.5 m within the area of existing ballasted track formation; and
- Up to eight borehole excavations within and outside of the existing rail formation using a drill rig to a depth of approximately 10 m. Three boreholes (located at Marrickville, Belmore x2) would be drilled from ground level within/outside of rail corridor ; three boreholes (located at Dulwich Hill, Hurlstone Park and Canterbury) will be drilled using portable, manually operated drilling equipment, and two boreholes (Campsie and Lakemba) using tight access low height/small drill rig.

Utilities Investigation

- Up to 76 potholes using non-destructive digging (NDD)/vacuum trucks to a depth of approximately 2.5 m within the areas of existing ballasted track formation.

The working areas for track slab investigations are located primarily within the area of existing track formation between station platforms, with the exception of boreholes which are located within and outside the corridor boundary (all locations are outlined in Appendix 1). The following table summarises the intended works scope at each station with respect to track slab Geotechnical and Utilities investigation works:

	Utilities	Geotechnical	
STATION	Potholes	Test Pits	Boreholes
Marrickville	14	10	1
Dulwich Hill	6	10	1
Hurlstone Park	10	10	1
Canterbury	8	10	1
Campsie	11	10	1
Belmore	5	8	2
Lakemba	11	8	1
Wiley Park	0	0	0
Punchbowl	11	10	0
Bankstown	0	0	0

2. Platform Excavations - Canterbury subsurface material investigations (CSR trenches) & Multi-channel Analysis of Surface Waves - Platform 2

Two test pits will be excavated along Canterbury Station Platform 2 to identify depth and variation of the subsurface rock profile to inform future design. Excavation work will be conducted by vacuum truck, which will require two 2 excavation trenches of up to 0.5 m by 2.0 m and to the depth of any subsurface rock or to 2.0 m. Excavation will be carried out by breaking through the asphalt layer using a concrete saw, followed by either manual excavation or using high pressure water and vacuum suction. Following the completion of works, the work site will be reinstated to its pre-existing condition.

A single line of Multi-channel Analysis of Surface Waves (MASW) investigation will also be carried out, with a 1m offset from the rear of the wall; i.e. parallel to the wall using non-intrusive geophysical equipment and non-invasive methods in order to gather subsurface rock and soil profiles along Platform 2.

3. Platform Excavations - Marrickville HV slit trenching - Platform 2

Up to seven trenches are proposed along Marrickville Station Platform 2 to expose the concrete cover of the existing HV line. Trenches will be excavated to approximately 1 m x 0.2 m in width and 1.5 m deep perpendicular to the direction of the track. Excavation will be carried out by breaking through the asphalt layer using a concrete saw, followed by either manual excavation or using high pressure water and vacuum suction. Following the completion of works, the work site will be reinstated to its pre-existing condition.

4. Test Pit to survey HV cables - Campsie Station Service Building

Two test pits in the area proposed for the Campsie Service Building (both located within the nominated area shown in Appendix 1) are required to identify the location and depth of existing Ausgrid HV cables. The pits will be excavated to a maximum depth of 2.5 m, using NDD excavation techniques. On completion, the test pit will be reinstated to match pre-existing conditions.

Works Methodology/Procedure

The following works procedure and equipment will be undertaken for each activity outlined earlier in this section:

1. Track Slab Investigations – All Stations (Excl. Wiley Park and Bankstown)

Geotechnical – Test pits

- Prior to excavation, the test locations will be scanned for buried services with help of Dial Before You Dig plans;
- Test pits will be excavated at the nominated locations to assess the subsurface conditions and determine levels, materials, strength and capacity of capping and subgrade within the rail track, and foundation location/type/extent for existing bridge and retaining wall structures;
- The test locations will be excavated with an excavator using a bucket to a depth up to 1.5m or prior refusal on weathered bedrock;
- The test pit will be logged in accordance with AS1726-2017 *Geotechnical Site Investigations*; details of the stratigraphy will be recorded;
- Disturbed soil samples will be collected for further observations and laboratory testing (if required);
- The test pits will be measured and logged from safe vantage points;
- Dynamic Cone Penetrometer (DCP) testing will be carried out from the test pits to a depth of about 3m below the track level or prior refusal using portable hand equipment;
- The excavated test pits will be backfilled in layers using excavated spoil and compacted using portable whacker packer, ballast will be topped up and compacted with excavator bucket; and
- Excess spoil will be collected, examined and disposed appropriately offsite. If acid sulphate soils are identified, they would be managed in accordance with the Acid Sulphate Soils Manual (Acid Sulphate Soil Management Advisory Committee, 1998) and Waste Classification guidelines – Part 4; Acid Sulphate Soils (refer to Appendix 1 Environmental Risk Assessment)

Geotechnical – Boreholes

- Prior to drilling commencement, all borehole locations will be scanned for buried services and Vac truck positioning;
- The drill rig with rubber track will be transported on the truck to nearby access point of the corridor or outside of corridor by ADE, the rig will then be unloaded near to the access point, loaded onto high rail and transported to the borehole locations under supervision of Rail Safety Officer and rail protection officer;
- The drill rig will be established at the approved site investigation location;
- A non-core vertical auger will drill into soil profile including logging, regular insitu testing at 1.5m intervals;
- Core drill in rock by diamond core drilling to at least 3m into Class III bedrock, the cores will be stored in core boxes, photographed, and logged. Point Load Strength tests will be carried out at 1m intervals;
- Disturbed soil samples and selected length of cores will be bagged and wrapped in plastic for laboratory testing as required;
- The core boxes will be loaded on to the support vehicle and transported to the ADE soil/rock testing laboratory for further observations and testing;
- Soil/rock samples will be characterised in accordance with AS1726-2017 *Geotechnical Site Investigations*;
- Drilling fluid/water will be collected into a portable tank and disposed of off-site appropriately at facilities licensed to accept the waste material;
- Borehole locations will be surveyed to MGA (GDA1994MGA Zone 56) co-ordinates and Reduced Level (RL) to Australian Height Datum (AHD);
- On completion, all the boreholes will be reinstated by ADE using quick set grout;
- Excess spoil will be collected and disposed appropriately offsite.;
- No groundwater monitoring wells are envisaged.

Utilities - Potholes

- Prior to NDD commencement, all pothole locations will be scanned for buried services and then NDD holes be carried out at targeted location;
- The NDD truck will mobilise to a nearby access point of the corridor or outside of corridor by subcontractor, and then drive to the pothole location under

supervision of ADE field engineer and rail protection officer or extended hoses will be utilised to reach targeted locations. No high-rail movement is envisaged;

- Pothole locations will be surveyed to MGA (GDA1994MGA Zone 56) co-ordinates and RL to AHD;
- The maximum depth of excavation will be 2.5m using NDD excavation techniques, however, services located at a depth greater than 2.5m will be interpolated from the existing information and or mapping from nearby pits or manholes;
- On completion, all potholes will be reinstated by ADE;

Excess spoil will be collected and disposed appropriately offsite. The following equipment will be used for the track slab utilities and geotechnical investigations:

- Hand digging equipment (e.g. shovels, crowbar, trowel)
- Survey hand tools
- Concrete saw
- Plate compactor or whacker packer
- Vacuum truck
- 3t tipper truck
- 3.5 - 5t Excavator
- Supporting vehicles.
- Drilling Rig
- Hand-held Coring Equipment
- Generator
- Portable Set-up Drill Rig

2. Platform Investigations – Canterbury CSR trenches, Platform 2

- Both test locations will be surveyed and cleared for all services prior to commencement of intrusive investigation;
- CSR trenches are proposed at the back of the riser wall. These trenches are approximately 1.8m wide and 2m deep. If rock is encountered behind the riser wall, then excavation into the rock will be required.
- The test pit excavation will be carried out using vacuum excavation method. The test pits shall be approximately 0.3m wide (parallel to the platform wall), 1.5m long (perpendicular to the platform wall) and extend up to a minimum depth of 2m or refusal on rock;
- The excavation will be carried out in such a way that the platform footings are not undermined within first 0.75m from the edge of the footings. The test pit excavation shall be carried out such a way that the rear face of the riser wall is exposed, and the riser wall geometry can be recorded;
- The depth to the bedrock to be recorded at three locations within the test pit as a minimum to allow profiling the rockhead perpendicular to the riser wall;

Excess spoil will be collected and disposed appropriately offsite. The following equipment will be used for the platform excavation investigations at Canterbury:

- Hand digging equipment (e.g. shovels, crowbar, trowel)
- Survey hand tools
- Concrete saw
- Plate compactor or whacker packer
- Hi-Rail Vacuum truck
- 3t tipper truck
- Supporting vehicles.

3. Platform Investigations – Marrickville Slit Trenches, Platform 2

- The Traffic Control Plan will be set-up at Marrickville Station (refer to TCP provided in Appendix 8);
- Prior to NDD commencement, all slit trench locations will be scanned for services and then NDD holes be carried out at targeted locations (in accordance with locations included in Appendix 1);
- The NDD team will break through the asphalt layer using saw cutting at all pothole locations;

- NDD excavation will then begin. The operator will follow service location markings and perform NDD on top of the subject underground services. When needed, the vacuum truck operator will connect additional hose attachments to reach the entire length of platform and cover all seven trenches;
- Trench locations will be surveyed to MGA (GDA1994MGA Zone 56) co-ordinates and RL to AHD. The surveyor will collect the below information:
    - Distance from platform coping to front edge of concrete casing
    - Depth of top of concrete casing
    - Width of concrete
    - Other services within trench (depth and type);
- All slit trenches will be reinstated with well compacted DGB20 material and finished with cold mix bitumen; and
- Excess spoil will be collected and taken to the ADE compound. The soils will be assessed for contamination by a qualified ADE Environmental Consultant and will be disposed off-site appropriately, at facilities licensed to accept the waste material.

The following equipment will be used for the platform excavation investigations at Marrickville:

- Hand digging equipment (e.g. shovels, crowbar, trowel)
- Survey hand tools
- Concrete saw
- Plate compactor or whacker packer
- Vacuum truck
- 3t tipper truck
- Supporting vehicles.

<u>4. HV cable test pit – Campsie SSB</u>

- Prior to NDD commencement, all test-pit locations will be scanned for buried services and then NDD holes be carried out at targeted location;
- The NDD truck will mobilise to a nearby access point of the corridor or outside of corridor by subcontractor, the truck will then drive to the pothole location under supervision of the ADE field engineer and rail protection officer or extended hoses will be utilised to reach targeted locations;
- Pothole locations will be surveyed to MGA (GDA1994MGA Zone 56) co-ordinates and RL to AHD;
- The maximum depth of excavation will be 2.5m using NDD excavation techniques, however, services located at a depth greater than 2.5m will be interpolated from the existing information and or mapping from nearby pits or manholes;
- On completion, all potholes will be reinstated by ADE; and

Excess spoil will be collected and disposed appropriately offsite.

The following equipment will be used for the platform excavation investigations at Campsie:

- Hand digging equipment (e.g. shovels, crowbar, trowel)
- Survey hand tools
- Concrete saw
- Plate compactor/whacker packer
- Vacuum truck
- 3t tipper truck
- Supporting vehicles.

<u>Working Hours</u>

The proposed works will be undertaken during and outside of standard construction hours, over the course of possession weekend 17 (October 24 and 25, 2020).

Standard working hours are defined as being *Monday to Friday between 7am and 6pm and Saturday between 8am and 6pm*.

Works planned during OOHW periods are assessed as part of a separate form (SMCSWSWM-OOHW14), which should be read in conjunction with this minor works approval.

Planned Commencement Date	The proposed works are scheduled for commencement on ***24 October 2020.***
Local Sensitivities: Describe the presence (if any) of local sensitive environmental areas and community receptors	Local environmental areas and sensitive receivers are presented in Appendix 1. **Noise and Air** • Noise and Vibration impacts for all works scheduled outside of regular working hours have been assessed as part of a separate Out-of-Hours Works (OOHW) form accompanying this minor works application (SMCSWSWM-OOHW14). • There are a number of residential properties located within close proximity to the corridor as identified in Appendix 1. Residual air quality impacts from survey works are expected to be minor in the presence of mitigation measures as outlined in the Environmental Risk Assessment within Appendix 1. **Contamination and Acid Sulphate Soils** • Metron T2M prepared a high-level review summary of previous ground contamination, potential acid sulphate soils and hazardous material investigative works that have been undertaken and reported on by others and made available to Metron T2M by Sydney Metro (Metron T2M, 23.09.2019). Data obtained indicates the likely presence of a number of Contaminants of Potential Concern (COPCs) associated with the use of the land as a railway over the last 70 years. COPCs throughout the rail corridor include: o Asbestos o Petroleum Hydrocarbons o Heavy Metals o Solvents o Herbicides. The Rail corridor between Sydenham and Punchbowl has been identified as having a medium to high risk of contamination. Although none of the areas identified in the Environmental Control Maps (Appendix 1) occur within known, recorded areas of contamination identified during previous surveys and investigations, all excavation works will be undertaken with care and in accordance with the unexpected find protocol (Appendix 2), should any suspected contaminated material be encountered. There is potential acid sulphate soil risk throughout the rail corridor (refer to Appendix 1), including the track slab works area proposed at Canterbury and Marrickville. The Unexpected Finds procedure (Appendix 2) will be followed should potential acid sulphate soils be encountered. Any acid sulphate soils that are identified would be managed in accordance with the Acid Sulphate Soil Manual (Acid Sulphate Soil Management Advisory Committee, 1998) and the Waste Classification Guidelines – Part 4: Acid Sulphate Soils (EPA, 2014). If any accidental spill occurs this will be managed in accordance with the contractor spill response procedure, (Appendix 2). All site vehicles must contain spill kits prior to the commencement of works. **Built Heritage (refer to Table 2 of the HIA, Appendix 5)** 1. Track Slab investigations – All Stations (Excl. Wiley Park and Bankstown) • The rail formation (including ballast, timber sleepers and rail beams) is considered an element of little heritage significance. The proposed works, including boreholes located outside of the rail formation area, will not involve any impacts to platform coping or any other element of heritage significance in proximity to the proposed working areas. Given all working areas will be reinstated to pre-existing conditions, the proposed track slab investigation works, including boreholes will result in a neutral direct impact and neutral visual impact to the significance of each Railway Station group associated with the works. 2. Platform Investigations – Canterbury test pits • Canterbury Station platform excavations are located away from on-platform buildings, platform coping edges and other elements of heritage significant fabric (such as sandstone cuttings, brick overbridge retaining walls and stair and ramp elements). These works will result in a neutral direct impact to significant heritage fabric. So long as reinstated surfaces are made good to

match existing surfaces, the proposed works would result in a negligible adverse visual heritage impact at Canterbury Station.

3. Platform Investigations – Marrickville Slit Trenches

- Marrickville Station platforms are listed as elements of exceptional heritage significance, however, the existing platform asphalt is a modern introduction and has been regraded over time. The proposed trenches will require the removal of the existing modern asphalt fabric, which would result in a neutral direct impact to the platform and the station overall. The proposed trenches will not immediately abut any heritage significant buildings along platform 2, resulting in a neutral direct impact to the station platform buildings. Overall, the proposed works will result in a negligible direct impact to the heritage significance of Marrickville Station. So long as reinstated surfaces are made good to match existing surfaces, the proposed works would not result in any adverse visual heritage impacts at Marrickville Station.

4. HV Cable test pit – Campsie SSB

- The SSB site for Campsie is located outside of all state and local heritage curtilages, and there is no significant heritage fabric located in the area of work. Following completion of the NDD service location works, the excavation area would be backfilled and made good. These works would result in a nil adverse direct and visual impact to the significance of Campsie Station.

Archaeological Heritage (refer to pp. 6-20 of the HIA, Appendix 5)

The ARD prepared for the SPIR for the project provides a detailed archaeological assessment for all stations on the T3 Bankstown Line. Significant archaeological remains were only identified at Marrickville, Canterbury, Belmore and Lakemba Stations in the ARD. As there are no predicted significant archaeological remains located at Dulwich Hill, Hurlstone Park, Campsie and Punchbowl Stations, no further discussions regarding archaeological impact assessment has been prepared for proposed ground disturbing works at these stations.

1. Track Slab Investigations – All Stations (Excl. Wiley Park and Bankstown)

- Former structures or artefact-bearing deposits are not predicted in the rail corridor or areas proposed for geotechnical boreholes as this area has been operating as an active railway line since the line was first constructed in the 1890s. It is not considered likely that ephemeral archaeological features would remain within the heavily modified rail formation. Overall, the track slab geotechnical and utilities investigations would have a nil - negligible impact to any archaeological resources in the area. However, since the proposed works at Marrickville, Canterbury, Belmore and Lakemba stations are taking place within State Heritage Curtilage (or an area of predicted significant archaeological remains in the case of Lakemba), a program of archaeological monitoring must be conducted, in accordance with provisions approved in the archaeological assessment and research design report for the project.

2. Platform Investigations – Canterbury

- The proposed test pit locations along platform 2 at Canterbury are not anticipated to occur within proximity to subsurface structural and artefactual remains. Impacts to archaeological remains are therefore considered negligible. However as the works are located within AMZ 2, management recommendations, as stated in the Environmental Risk Assessment (ERA - Appendix 1), including archaeological monitoring in accordance with the AMS outlined in the HIA (Appendix 5) will be undertaken.

3. Platform Investigations – Marrickville

- The proposed trench locations are identified to be located within areas containing Moderate to high potential for locally significant remains related to phase 2 (1890-1920) of Marrickville Station Railway infrastructure. As there are no identified former structures in this location, the impact to archaeological resources from the trenching at Marrickville Platform 2 is considered nil to negligible. As the proposed works are located with AMZ 1, management recommendations, as stated in the Environmental Risk Assessment (ERA - Appendix 1), include archaeological monitoring and salvage, as required, in accordance with the AMS outlined in the HIA provided in Appendix 5.

	Biodiversity • A number of areas of threatened ecological communities, habitat for threatened species and threatened plant species (*Acacia pubescens*) have been identified throughout the rail corridor. All nominated working areas, as outlined in the Environmental Control Maps in Appendix 1, are outside of these ecologically significant areas. As the works are taking place primarily within and directly adjacent to the ballasted track area and platforms, no impacts to ecologically significant vegetation or habitat is predicted to occur. Furthermore, the works will not require the removal or trimming of any vegetation along within or outside of the corridor. Slit trenching activities at Marrickville station would be undertaken along the platform and would be within close proximity to the drip line of street trees positioned behind the platform. The risk of impact to tree health and integrity of the trees through encroachment of tree roots is however considered minor, given the depth of trenches and non-destructive digging methods. In accordance with the mitigation measures listed in the Appendix 1 ERA, all slit trench would be undertaken outside of the drip line of trees where possible and work crews are to be mindful when working within close proximity of trees to avoid impacting tree roots during NDD activities. **Erosion, Sedimentation and Water Quality** • Works will occur in the vicinity of local stormwater systems. There is a low erosion and sedimentation risk associated with the proposed survey work, particularly during activities involving ground disturbance and excavation of subsurface material. Excavator excavated spoil will be temporarily stockpiled onsite prior to being used as backfill. NDD and borehole spoil will be collected in tanks and removed from site. Stockpiled material will be stored out of drainage channels and contained during inclement weather. Further, any excavated areas left for any extended period of time will be covered to avoid exposure to surface runoff.

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.).	Environmental Control Maps (Appendix 1) showing the local sensitivities discussed in Part 2 will be provided to the survey teams to ensure impacts are avoided. The mitigation measures developed as part of the environmental risk assessment (provided in the Environmental Risk Assessment - Appendix 1) will be provided to survey teams as part of the pre-survey induction. Works will also be undertaken in accordance with the: – *Sydney Metro Unexpected Find Process (v2.0)* – *The Unexpected Finds Procedures for contamination and heritage (Appendix 2).* – *The Sydney Metro Sydenham to Campsie monthly notifications for October 2020, provided (Appendix 3).* – *Heritage Impact Assessment Report (Appendix 5) and Addendum HIA Assessment (Appendix 6).*

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?	At least 24 hours prior to the proposed works commencing (following approval), the Environmental Minor Works Approval Team will undertake a pre-works briefing with the PC Representative and Site Supervisor, to ensure the site team is correctly prepared to carry out works in accordance with approval. Briefing to include, as a minimum:
	• Confirmation of site approval boundaries
	• Works scope
	• Key environmental constraints and mitigation measures for each aspect, including
	  • Noise and Vibration
	  • Air Quality
	  • Heritage

	• Ecology • Soil and Water • Roles and responsibilities of all site members Prior to commencing any works on site, on the day of the proposed works 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, and ECRs relevant to each location. A copy of all induction records will be provided to Sydney Metro upon request.

Part 5: Community Consultation

What community consultation has been undertaken already?	The Sydney Metro October 2020 monthly notifications for Sydenham to Bankstown alignment include reference to the activities proposed (included in Appendix 3). Consultation with Sydney Trains regarding the proposed work methodology was undertaken and endorsed by Sydney Trains via the WE17 Sydney Trains Notification Letter, included within Appendix 3.
What community consultation is planned to be undertaken?	All further works beyond October 2020 will be included within subsequent monthly notifications and additional targeted notifications, as required by the Sydney Metro OCCS. In accordance with the Sydney Metro OCCS, 7 days notification will be given to the community prior to works starting.
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:	Luke Palmer	**Position:**	Project Manager	**Phone:**	[redacted]
	Ben Fethers		Environmental Manager		[redacted]
	Deeppal Dhillon		Communications Manager		[redacted]

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:	Ben Fethers		
Signature:		**Date:**	19.10.2020

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:			
Name:	May Li Foong	Fil Cerone	Jo Heltborg
Date:	20/10/20	23 Oct 2020	20/10/20
Comments:			*Supporting letter attached as Appendix 4 if necessary.*
Conditions:	As per part 5		*Supporting letter attached as Appendix 4 if necessary.*

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

Appendix 1: Environmental Risk Assessment and Environmental Control Maps

Aspect	Potential environmental impact	Initial risk rating			Control measures	Residual risk rating		
		Consequence	Likelihood	Risk		Consequence	Likelihood	Risk
Air quality and noise emissions	Noise and air quality impacts on nearby sensitive receivers.	5	4	Low	• Any stockpiles are to be covered during windy weather • Visual observation of dust emissions by PC representative will trigger dust suppression mitigation strategies, including wetting of the excavation area • Site equipment is to be turned off when not in use • Induction and pre-start briefing to include noise mitigation and "good neighbour" approach • The engines of plant and equipment will only be turned on when moving the plant into place as required and repositioning i.e. no idling. • Avoid the coincidence of noisy plant working simultaneously close together and adjacent to sensitive receivers where possible. • Surveyors are not to shout, slam doors, drop objects or make any other unnecessary noise. • Surveyors are to be mindful of local residents when leaving and entering the site. • Non-tonal reversing alarms would be used. • Plant will be orientated, where possible, to minimise noise impacts to receivers (e.g. exhaust pointing away from receivers). • Where feasible and reasonable, the offset distance	5	5	Low

Aspect	Potential environmental impact	Initial risk rating			Control measures	Residual risk rating		
		Consequence	Likelihood	Risk		Consequence	Likelihood	Risk
					between noisy plant items and nearby noise sensitive receivers would be as great as possible. A program of operator attended noise monitoring will be undertaken at sensitive receivers expected to experience noise exceedances above 20 dBa of established NMLs at Hurlstone Park, Canterbury, Campsie and Lakemba (refer to findings of OOHW14 application). The purpose of the monitoring would be to validate the existing RLB/NMLs by enabling characterisation of the sound profile and identifying exceedances of validated RBL's resulting directly from construction activities. Real time data is then able to be used to inform onsite noise mitigation. Which may include enforcement of respite periods to reduce each 15-minute period below the prescribed RBL. All instrumentation will be programmed to record statistical noise level indices in 15 minute or lower intervals which may include the LAmax, LA1, LA10, LA90, LAmin and the LAeq.			
Mobilisation of contamination	Local contamination and health risk to surveyors	4	4	Moderate	• Surveyors will be vigilant for hazardous materials (e.g. asbestos, hydrocarbons, lead,	4	5	Low

Aspect	Potential environmental impact	Initial risk rating			Control measures	Residual risk rating		
		Consequence	Likelihood	Risk		Consequence	Likelihood	Risk
					benzo(a)pyrene, acid sulphate soils) that may be uncovered during investigations. • Unexpected finds procedure (Appendix 2) will be followed. Reference to this procedure will be included within the contractor induction material. • If acid sulphate soils are encountered, they would be managed in accordance with the Acid Sulphate Soil Manual (Acid Sulphate Soil Management Advisory Committee, 1998) and the Waste Classification Guidelines – Part 4: Acid Sulphate Soils (EPA, 2014). Add into mitigation measures? • No refuelling will occur in the work area. • Spill kits will be kept near to work areas at all times. Trained staff are to be present at all times in case of a spill.			
Work in heritage areas	Potential impacts to heritage may occur as a result of investigation works.	3	4	Moderate	During excavation works at all stations, in accordance with the HIA provided in Appendix 5 (and Addendum HIA provided in Appendix 6) the following recommendations are provided to ensure that inadvertent impacts to significant fabric and archaeological remains occurs: • All excavation is to be conducted within the areas outlined within the environmental sensitivity maps provided in this Minor Works	4	5	Low

Aspect	Potential environmental impact	Initial risk rating			Control measures	Residual risk rating		
		Consequence	Likelihood	Risk		Consequence	Likelihood	Risk
					Approval, HIA and Addendum HIA. • A heritage induction should be given to all investigation crews and the location and heritage significance of significant fabric and archaeological remains should be made aware to crews prior to work commencing in any given area. • Excavation works on platforms at Canterbury, Campsie and Marrickville Stations should be conducted as far as reasonably possible away from significant fabric (such as platform coping, sandstone cuttings, brick retaining walls, steel trellises or station platform buildings). Should excavation occur near to these elements of significant fabric, fabric should be protected from splash excavation material during the works. This would ensure that outer surfaces are kept clean during works. • Borehole excavation on hardstand surfaces must involve hand tools (power saw cutters or the like) to remove the hardstand prior to excavating with a borehole rig. This original hardstand should be reinstated following excavation and made good to provide a seamless appearance in the hardstand. • Geotechnical and service investigation within and outside			

Aspect	Potential environmental impact	Initial risk rating			Control measures	Residual risk rating		
		Consequence	Likelihood	Risk		Consequence	Likelihood	Risk
					the rail formation at all stations should be conducted at least 0.5 m from the brick platform retaining walls, to avoid inadvertent damage to these high significance elements. Where works are located in within 1.0 m of the walls, care should be taken to ensure that the brickwork is protected from splash from excavation, or made good and cleaned following works. • Following the completion of excavation works, all areas of investigation should be made good to restore the platform and ground surfaces to their original appearance. This would include: ▪ Cleaning all asphalt, concrete and brick surfaces that may have been dirtied during works ▪ Ensuring that asphalt surfaces are reinstated following the completion of backfilling so that they match surrounding asphalt surfaces. • In the event that significant and intact remains not identified in the project ARD are encountered during works, all excavation works would cease, the remains protected, and further assessment undertaken. Additional consultation with Heritage NSW may be required and additional archaeological			

Aspect	Potential environmental impact	Initial risk rating			Control measures	Residual risk rating		
		Consequence	Likelihood	Risk		Consequence	Likelihood	Risk
					management undertaken prior to works being able to proceed. In addition, during excavation works at Marrickville, Canterbury, Belmore and Lakemba Stations), the following additional archaeological controls are recommended: • A program of archaeological monitoring must be conducted, in accordance with provisions approved in the archaeological assessment and research design report for the project, for ground disturbing works at Marrickville, Canterbury, Belmore and Lakemba Stations (including boreholes at Marrickville and Belmore). • During archaeological monitoring, should significant remains be identified, these remains should be archaeologically recorded and protected. The proposed investigation location must be relocated, under the supervision of the monitoring archaeologist, to ensure that no impacts occur to the archaeological resource.			
Work in biodiversity areas	No impact to biodiversity. Invasive works will not be undertaken in designated biodiversity areas. No vegetation will be impacted by the survey work.	4	5	Low	• All excavation works are to be undertaken within areas nominated in environmental sensitivity maps (i.e. outside of areas containing EEC vegetation). All ancillary machinery/equipment and spoil/stockpiles must not be kept in close proximity to	4	6	Low

Aspect	Potential environmental impact	Initial risk rating			Control measures	Residual risk rating		
		Consequence	Likelihood	Risk		Consequence	Likelihood	Risk
					ecologically sensitive areas, namely patches of EEC vegetation. • The northern borehole excavation area at Belmore Station is located within proximity to the landscaped gardens on the corner of Burwood Road and Redman Parade. Work crews are to avoid establishing equipment or material within the grassed area and must ensure that the grass and landscaped elements of the garden are not modified or damaged in any way during works. • All machinery and heavy plant and equipment is to be parked within existing cleared areas and outside of the drip line of mature trees where possible. • No vegetation clearing is to be undertaken • All slit trenching at Marrickville would be undertaken outside of the drip line of trees where possible and work crews are to be mindful when working within close proximity of trees to avoid impacting tree roots during NDD activities. • Park vehicles in designated areas only			
Erosion and sedimentation control	Runoff of excavated materials into the local stormwater system. Potential for escape of contaminated materials causing local contamination.	5	5	Low	• Use of vacuum truck will minimise need to stockpile material • Stockpiled material will be stored out of drainage channels	5	6	Low

Aspect	Potential environmental impact	Initial risk rating			Control measures	Residual risk rating		
		Consequence	Likelihood	Risk		Consequence	Likelihood	Risk
					and contained during inclement weather • Any excavated material that needs to be stockpiled to be placed on geofabric or a plastic sheet. • Any excavated areas left for any extended period of time will be covered to avoid exposure to surface runoff.			
Transport and access	Negative impact to local roads, parking and footpaths from closures or obstructions during survey work.	5	5	Low	• Personnel will park within the rail corridor where possible. • Personnel will minimise the number of vehicles used to travel to the site and avoid impeding pedestrian and vehicular traffic at all times. • Personnel will park legally and observe restrictions at all times • Pedestrian detours will be implemented by traffic control to minimise transport disruptions to pedestrians during works periods.	5	6	Low
Weeds	Contact and induced proliferation of priority weeds as listed under the Biosecurity Act 2015	5	5	Low	• Any priority weeds identified within the works area would be managed in accordance with the *Biosecurity Act 2015*. • Weeds of national environmental significance would be managed in accordance with the Weeds of National Significance Weed Management Guide.	5	6	Low
Service strike	Damage to services during excavation which cause an	4	4	Moderate	Prior to any ground disturbance works, a	4	5	Low

Aspect	Potential environmental impact	Initial risk rating			Control measures	Residual risk rating		
		Consequence	Likelihood	Risk		Consequence	Likelihood	Risk
	environmental incident				service locator will check each excavation site is clear of services and provide a permit to excavate: • Service locator and surveyor will check all excavation locations with DSS and locating equipment to identify areas clear of services • Where there is a clash of services and proposed excavation site the excavation site will be moved to a services-free area • Excavation area will be sprayed with spray paint by service locator once confirmed clear, approx. 1m square section			
Waste	Improper management of waste could result in an environmental incident	4	4	Moderate	• Induction of staff will include waste management practices, • Wastes (e.g. food scrap, empty fuel canisters) will be lawfully transported and disposed of. • All liquid and/or non-liquid waste generated on site shall be assessed and classified in accordance with Waste Classification Guidelines and managed appropriately according to its classification.	4	5	Low

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 eco . Extensive remediation required.	Irreversible large-scale environmental impact with loss of valued eco .
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/apprehensi on. 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: Very High – A – 31-36 High – B – 22-30 Medium – C – 11-21 Low – D – 1-10			CONSEQUENCE					
			Insignificant	Minor	Moderate	Major	Severe	Catastrophic
			C6	C5	C4	C3	C2	C1
LIKELIHOOD	Almost certain	L1	20	22	29	32	34	36
	Very Likely	L2	14	18	23	28	31	35
	Likely	L3	9	12	16	24	27	33
	Unlikely	L4	6	7	11	17	25	30
	Very Unlikely	L5	3	4	8	13	19	26
	Almost Unprecedented	L6	1	2	5	10	15	21

Environmental Control Maps

Southwest Metro Design Services
PCMW14: Environmental Sensitivities Map

- Corridor Boundary
- Rail Stations

Platform investigations - Marrickville
- Marrickville HV slit trench locations

Track slab investigations (geotech and utilities)
- Track slab geotechnical and utilities investigations
- Track slab geotechnical and utilities investigation - additional boreholes

Heritage
- S170 heritage
- Archaeological management zone
- State heritage
- Local heritage

Land uses
- Commercial
- Medical
- Outdoor passive
- Place of worship
- Residential

1 cm = 12 meters
GDA 1994 MGA Zone 56
Date: 19/10/2020

0 30 60
Meters

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PCMW14: Environmental Sensitivities Map

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Contamination AGJV (approx. location)
- General solid waste
- General slid waste w asbestos
- Restricted solid waste

GHD 2017 Contamination (approx. location)
- General solid waste
- General solid waste w asbestos
- Hazardous waste
- Restricted solid waste
- Not completed

Acid Sulfate Soil
- Potential Acid Sulfate Soil

Vegetation
- Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest (ME004, Moderate/good)
- Degraded Turpentine - Grey Ironbark open forest on shale (ME041, Moderate/good-poor)
- Turpentine - Grey Ironbark open forest on shale (ME041, Moderate/good-medium)
- Exotic grassland
- Exotic scrub or forest
- Planted native vegetation

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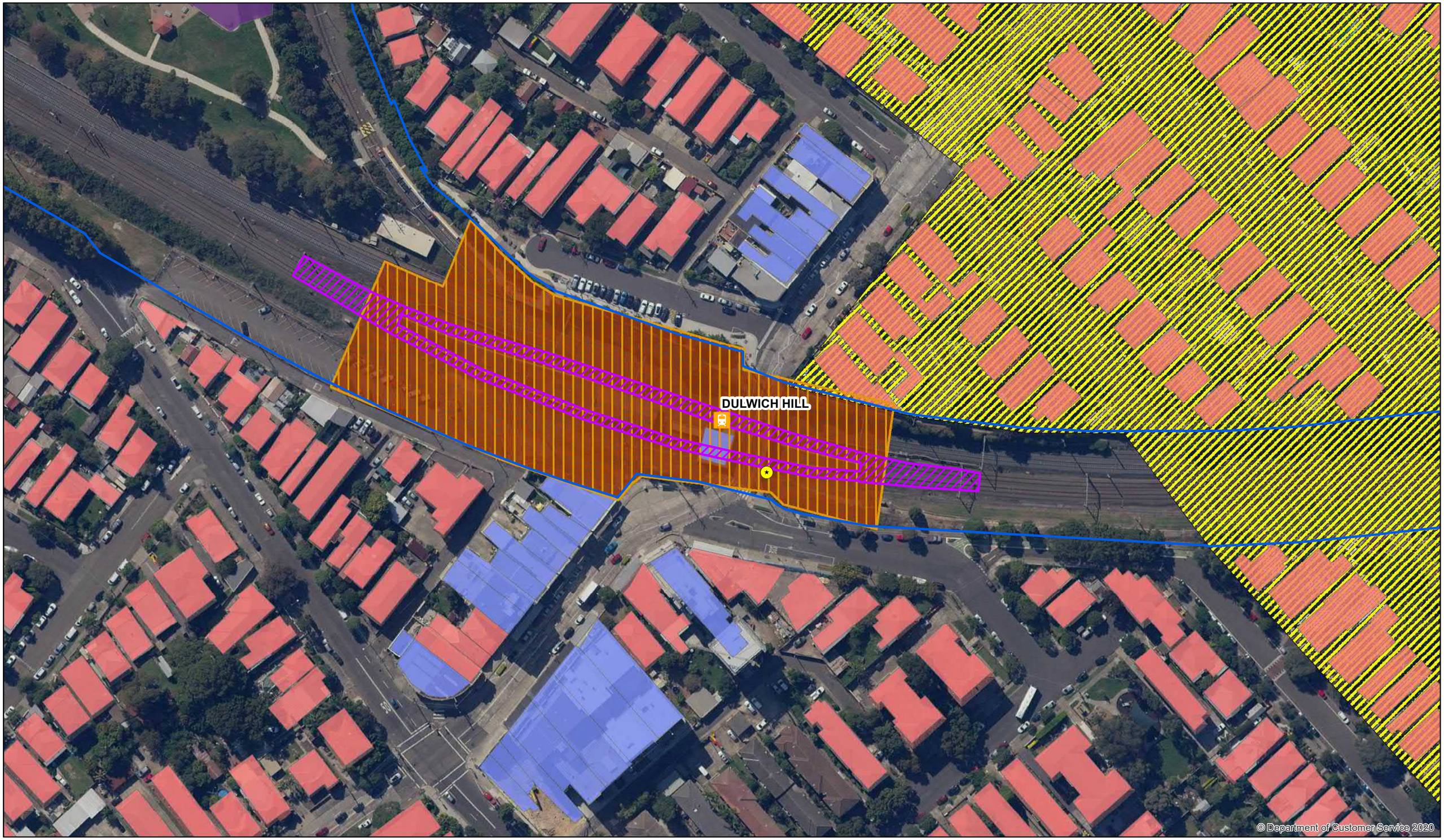

Southwest Metro Design Services
PCMW14: Environmental Sensitivities Map

Corridor Boundary
Rail Stations

Track slab investigations (geotech and utilities)
Track slab geotechnical and utilities investigations
Track slab geotechnical and utilities investigation - additional boreholes

Heritage
S170 heritage
Local heritage

Land uses
Commercial
Outdoor active
Residential

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Meters

Southwest Metro Design Services
PCMW14: Environmental Sensitivities Map

- Corridor Boundary
- Rail Stations

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- General solid waste
- General slid waste w asbestos
- Restricted solid waste

GHD 2017 Contamination (approx. location)

- General solid waste
- General solid waste w asbestos
- Hazardous waste
- Restricted solid waste
- Not completed

Vegetation

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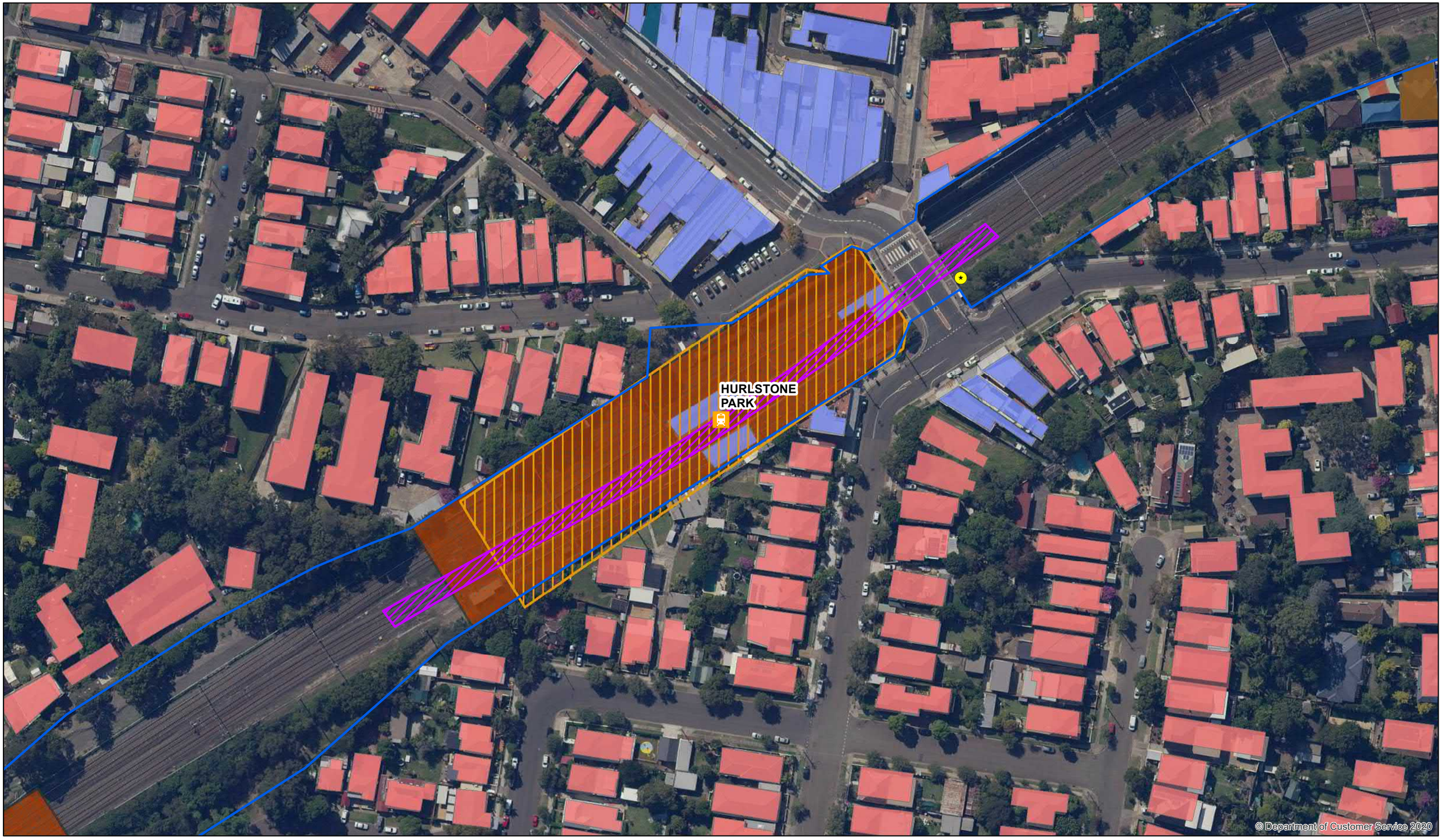

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PCMW14: Environmental Sensitivities Map

Corridor Boundary
Rail Stations

Track slab investigations (geotech and utilities)
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Heritage
S170 heritage
Local heritage

Land uses
Childcare
Commercial
Medical
Residential

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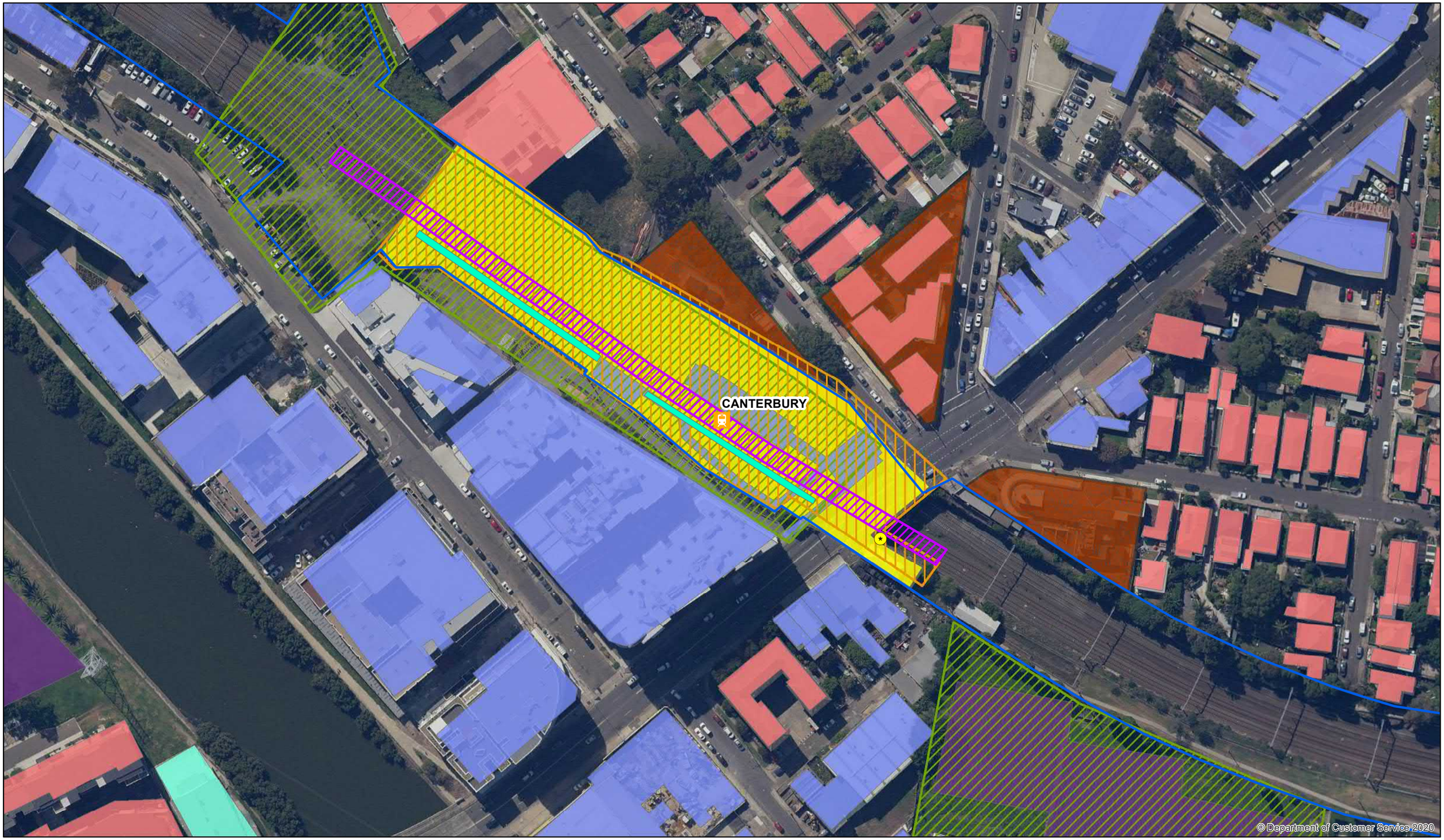

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PCMW14: Environmental Sensitivities Map

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Platform subsurface material investigations - Canterbury

- Platform excavations - Canterbury subsurface material investigation and MASW

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- Track slab geotechnical and utilities investigations
- Track slab geotechnical and utilities investigation - additional boreholes

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- State heritage
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Land uses

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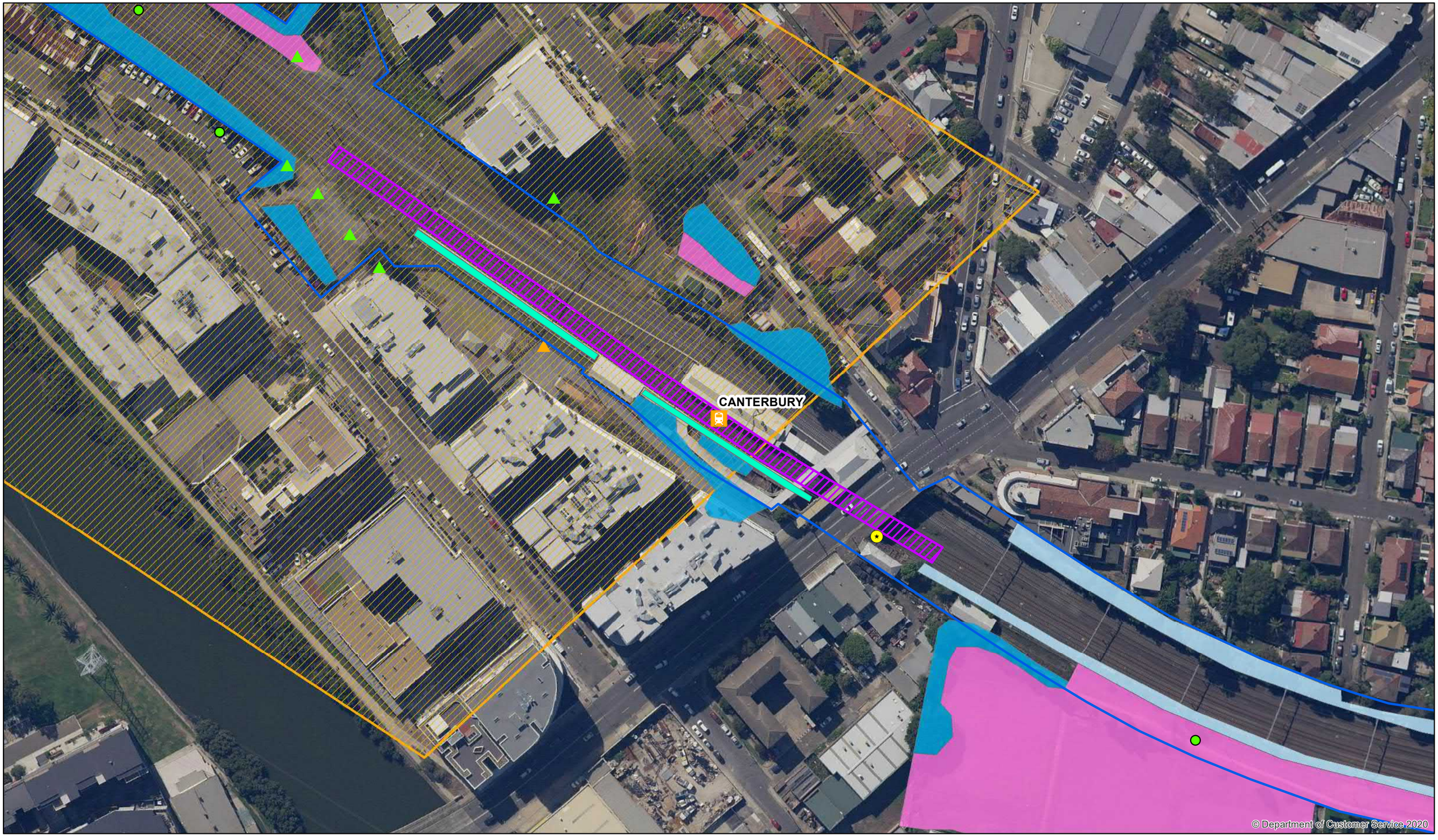

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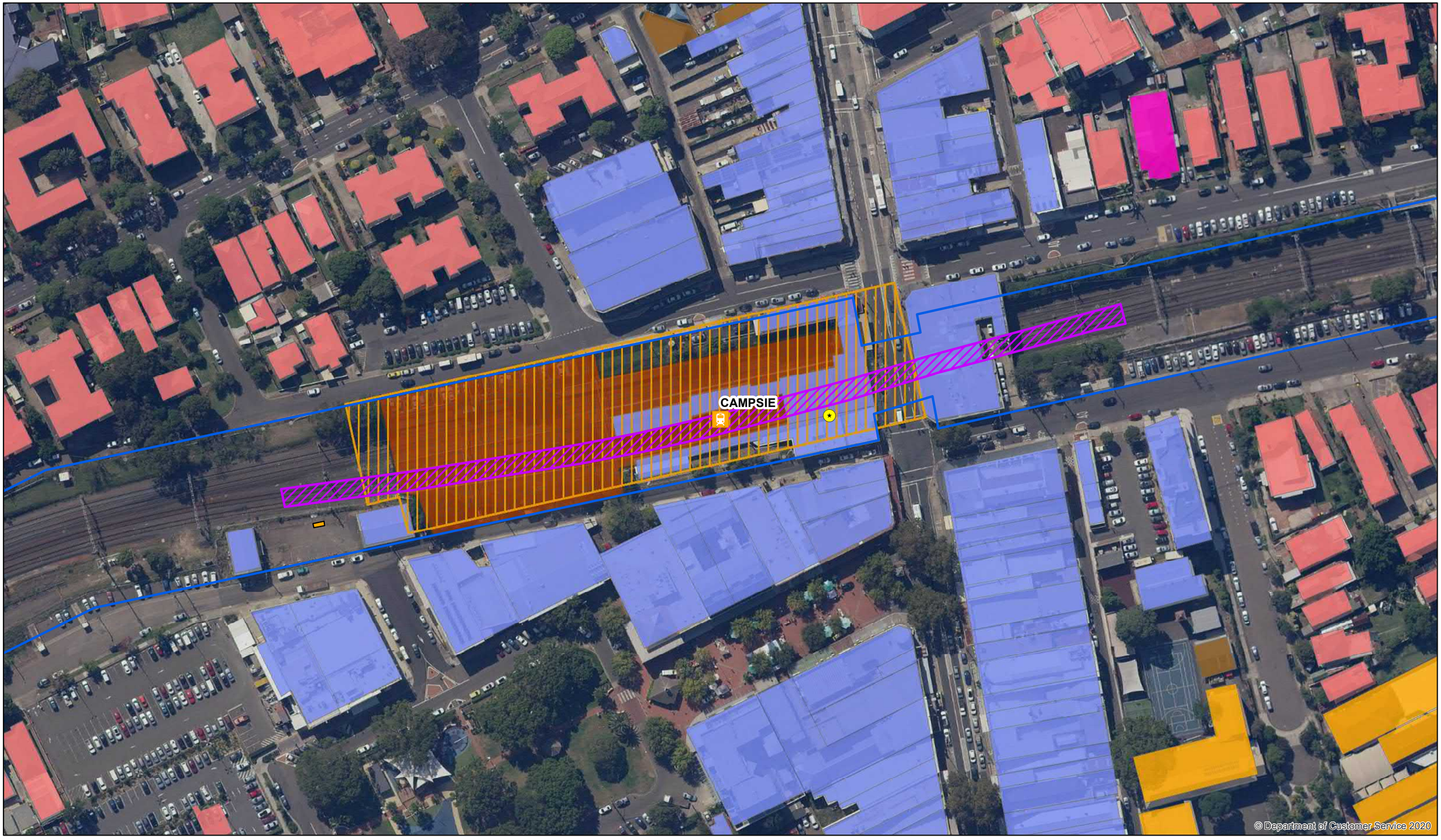

Southwest Metro Design Services

PCMW14: Environmental Sensitivities Map

Corridor Boundary

Rail Stations

SSB test pits - Campsie

Test pit to survey HV cables

Track slab investigations (geotech and utilities)

Track slab geotechnical and utilities investigations

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Heritage

S170 heritage

Local heritage

Land uses

Childcare

Commercial

Education

Medical

Place of worship

Residential

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PCMW14: Environmental Sensitivities Map

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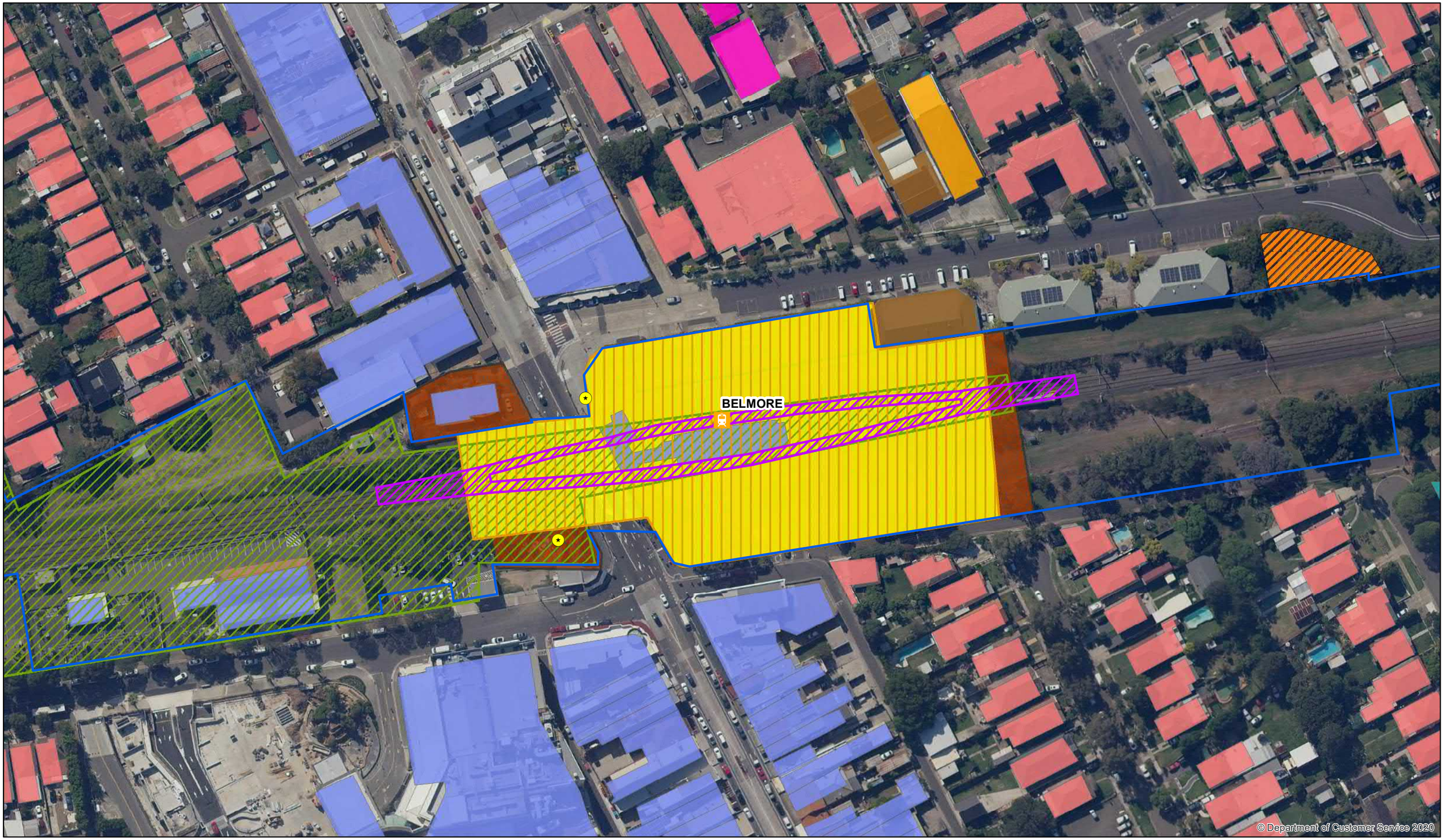

Southwest Metro Design Services
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- Track slab geotechnical and utilities investigations
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Heritage

- S170 heritage
- Archaeological management zone
- Potential archaeological deposit
- State heritage
- Local heritage

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- Education
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- Outdoor passive
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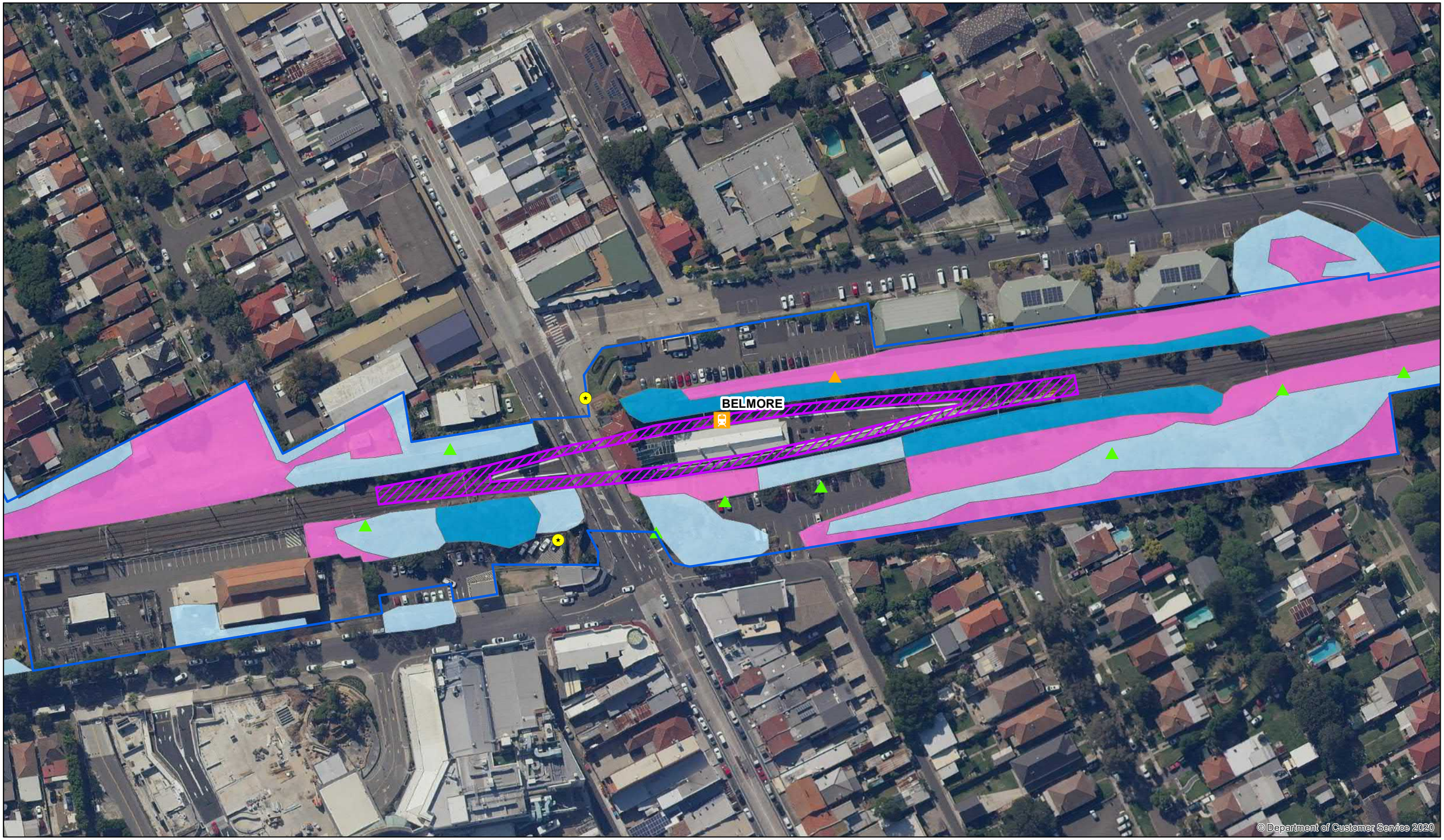

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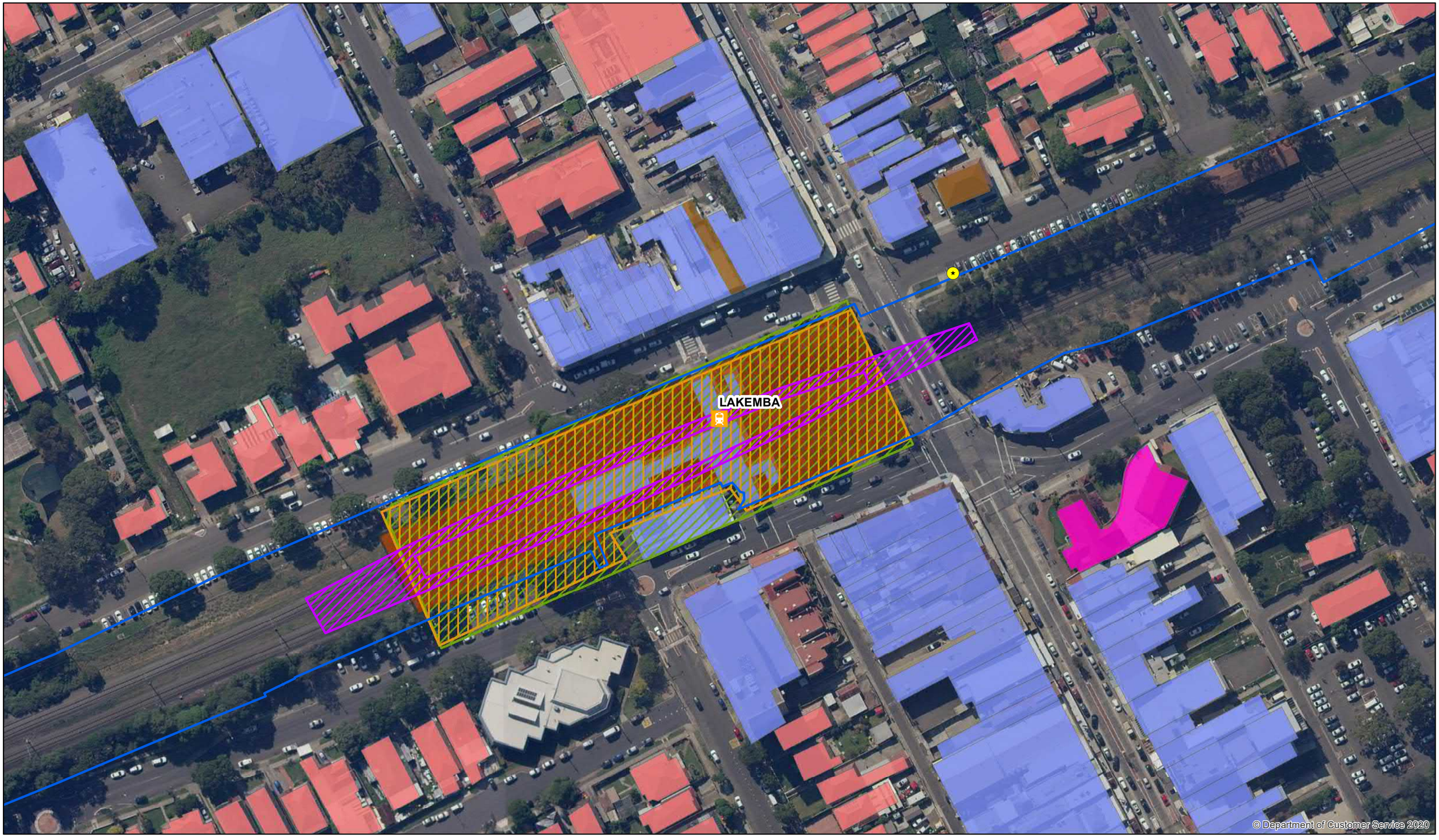

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Heritage

- S170 heritage
- Archaeological management zone
- Local heritage

Land uses

- Childcare
- Commercial
- Education
- Medical
- Place of worship
- Residential

1 cm = 12 meters
GDA 1994 MGA Zone 56
Date: 19/10/2020

0 30 60
Meters

Southwest Metro Design Services
PCMW14: Environmental Sensitivities Map

Corridor Boundary
Rail Stations

Track slab investigations (geotech and utilities)
Track slab geotechnical and utilities investigations
Track slab geotechnical and utilities investigation - additional boreholes

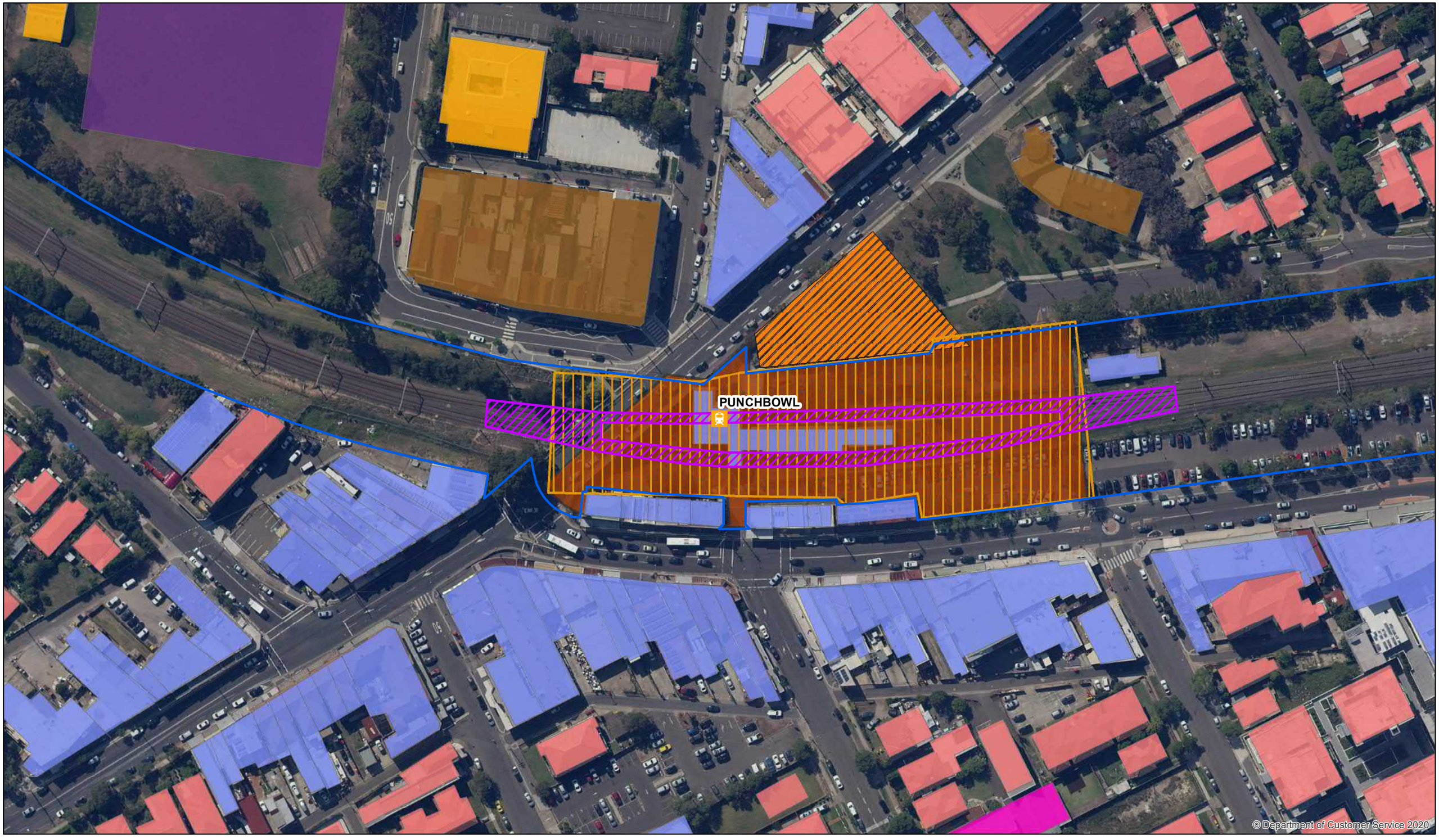
Contamination AGJV (approx. location)
General solid waste
General slid waste w asbestos
Restricted solid waste

GHD 2017 Contamination (approx. location)
General solid waste
General solid waste w asbestos
Hazardous waste
Restricted solid waste
Not completed

Vegetation
Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest (ME004, Moderate/good)
Degraded Turpentine - Grey Ironbark open forest on shale (ME041, Moderate/good-poor)
Turpentine - Grey Ironbark open forest on shale (ME041, Moderate/good-medium)
Exotic grassland
Exotic scrub or forest
Planted native vegetation

1 cm = 12 meters
GDA 1994 MGA Zone 56
Date: 19/10/2020

0 30 60
Meters



Southwest Metro Design Services
PCMW14: Environmental Sensitivities Map

Corridor Boundary
Rail Stations
Track slab investigations (geotech and utilities)
Track slab geotechnical and utilities investigations
Heritage
S170 heritage
Potential archaeological deposit
Local heritage
Land uses
Childcare
Commercial
Education
Outdoor active
Place of worship
Residential

1 cm = 12 meters
GDA 1994 MGA Zone 56
Date: 19/10/2020

0 30 60
Meters

Southwest Metro Design Services
PCMW14: Environmental Sensitivities Map

- Corridor Boundary
- Rail Stations

Track slab investigations (geotech and utilities)
- Track slab geotechnical and utilities investigations

Contamination AGJV (approx. location)
- General solid waste

- General slid waste w asbestos
- Restricted solid waste

GHD 2017 Contamination (approx. location)
- General solid waste
- General solid waste w asbestos
- Hazardous waste

- Restricted solid waste
- Not completed
- Acacia pubescens
- Acacia pubescens patches

Vegetation
- Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest (ME004, Moderate/good)
- Degraded Turpentine - Grey Ironbark open forest on shale (ME041, Moderate/good-poor)
- Turpentine - Grey Ironbark open forest on shale (ME041, Moderate/good-medium)
- Exotic grassland
- Exotic scrub or forest
- Planted native vegetation

1 cm = 12 meters
GDA 1994 MGA Zone 56
Date: 19/10/2020

0 30 60
Meters

Appendix 2: Environmental Management Documentation

Unexpected Finds - Contamination

In the case that an environmental consultant is not available for oversight, workers will be vigilant for hazardous materials that may be uncovered during investigations. Unexpected finds include, but are not limited to, odour, visual contamination, acid sulfate soils, deleterious material inclusions, asbestos containing material, Underground Storage Tanks (USTs) or any other suspect materials. Any unexpected finds will be reported to the Contractor's on-site manager immediately. Additionally, the site owner/occupier should be informed as soon as practical following an unexpected find.

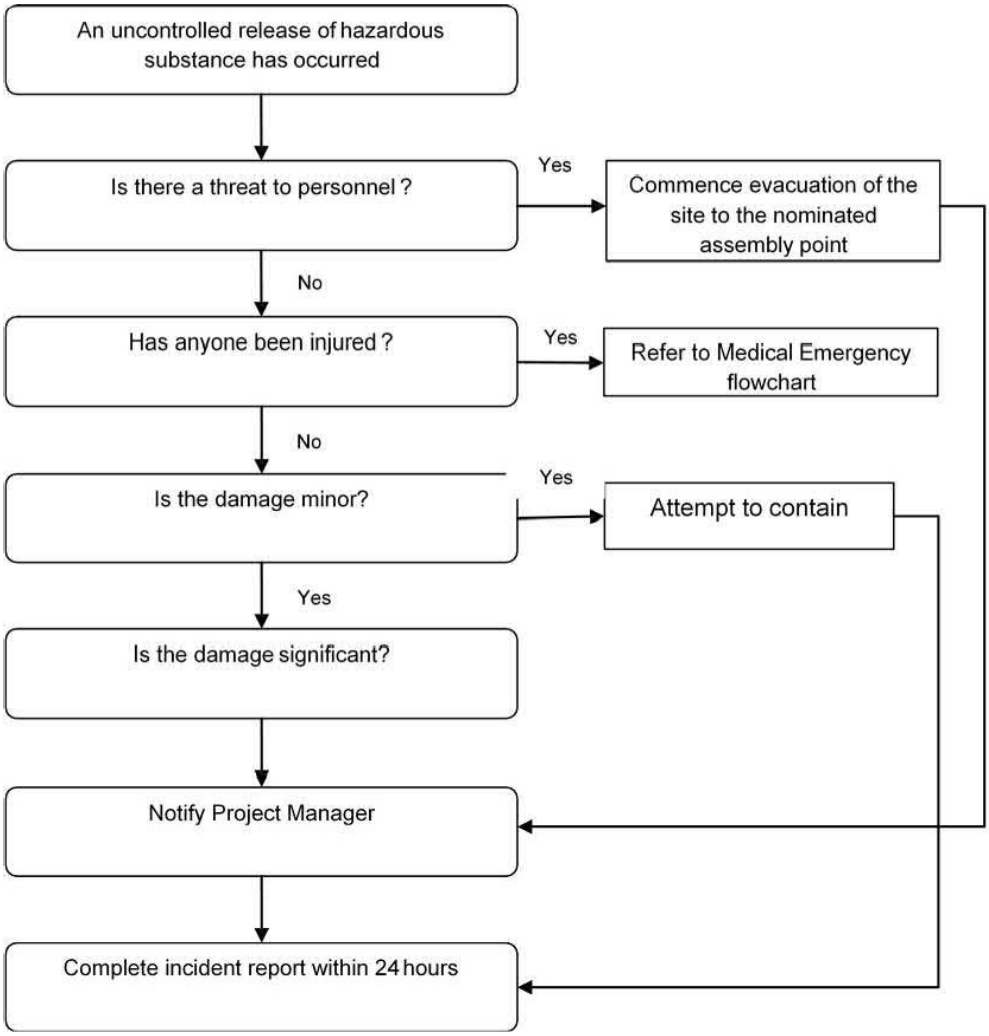
If hazardous materials are uncovered / discovered during excavations the Contractor shall:

- Cease all work in that vicinity (and fence the area if appropriate)
- Remove workers from the vicinity
- An experienced environmental consultant / occupational hygienist should be contacted to assess the potential risks associated with the Unexpected Finds and provide appropriate management options
- Investigate the nature of the risk of the materials, determine the appropriate response and document the actions in accordance with contractual obligations.
- In the event of a serious unexpected find, which could cause harm to human health and/or the environment, TfNSW and the NSW EPA may need to be informed.

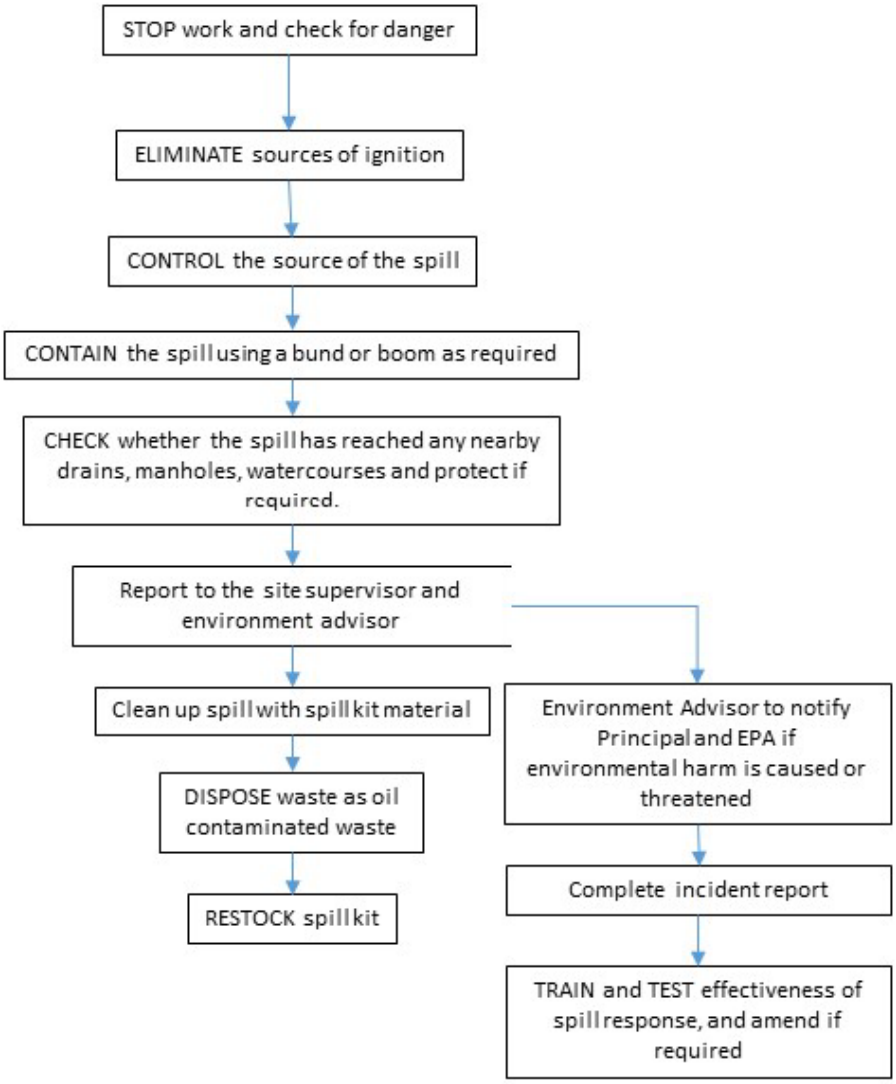
Unexpected Finds – Heritage

The risks posed by the removal works to Aboriginal or European heritage are expected to be minimal. However, in the event potential heritage items are encountered during soil sampling works, the Sydney Metro Unexpected Heritage Finds Procedure will be implemented. The following actions are to be implemented by the site team in the instance of a potential unexpected heritage find:

- Stop work, protect item, establish a ‘no-go zone’ around the item/area and inform the site supervisor.
- Site supervisor to contact and engage an archaeologist or Aboriginal Heritage Consultant (Duncan Jones, Artefact, [redacted] and await further instruction. No works are to be undertaken within ‘no-go zone’ until advice received.
- Preliminary assessment and recording of the find under advice of archaeologist or Aboriginal Heritage Consultant.
- The Contract Environmental Manager to notify Sydney Metro Environment and Planning Manager and the ER of any unexpected finds.


An uncontrolled release of hazardous substance has occurred
Is there a threat to personnel ?
Yes
Commence evacuation of the site to the nominated assembly point
No
Has anyone been injured ?
Yes
Refer to Medical Emergency flowchart
No
Is the damage minor?
Yes
Attempt to contain
Yes
Is the damage significant?
Notify Project Manager
Complete incident report within 24 hours

Example Emergency Spill Response Procedure



Appendix 3: Community Notification

Sydney Trains

Central to Cabramatta track maintenance

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What we're doing

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How this affects you

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- **Work will take place around the clock from 10.30pm Friday 23 October until 2am Monday 26 October.**
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City & Southwest

Notification - Bankstown Line metro upgrade

□□tober 2020

Sydney Metro is Australia's biggest public transport project.

Services started in May 2019 in the city's North West with a tr□□□e□er□o□ □ □□te□ □t□e □e□□□Metro r□l□□ll be e□te□ded □to t□e □□□ □□d be□o□d to □□□□□to□□ □□ 202□□□□ere □ll be □e□ □□□ □etro r□l□□□ t□to□□ □□dergro□□d □t M□rt□□ □l□□e□□tt □treet □□d □□r□g□roo □□d □e□ □etro □l□tor□ □□t □e□tr□l□

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Sydney Metro will continue to undertake work across its projects in accordance with current Government advice, and will continue to implement physical distancing and travel and hygiene measures to protect employees and members of the community. Continuing with these works is critical to ensuring project continuity, and the project team will continue to review and assess activities in line with any further updates.

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Detail of day work (along rail corridor from Sydenham to Dulwich Hill)
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Out-of-hours work

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Date / time	Detail of work
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Date / time	Detail of work (along the rail corridor from Sydenham to Dulwich Hill)
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Keeping you informed

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southwestmetro@transport.nsw.gov.au

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City & Southwest

Notification - Bankstown Line metro upgrade

□□tober 2020

Sydney Metro is Australia's biggest public transport project.

Services started in May 2019 in the city's North West with a tr□□□e□er□o□ □ □□te□ □t□e □e□□□Metro r□l□□ll be e□te□ded □to t□e □□□ □□d be□o□d to □□□□□to□□ □□ 202□□□□ere □ll be □e□ □□□ □etro r□l□□□ t□to□□ □□dergro□□d □t M□rt□□ □l□□e□□tt □treet □□d □□r□g□roo □□d □e□ □etro □l□tor□ □□t □e□tr□l□

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Sydney Metro will continue to undertake work across its projects in accordance with current Government advice, and will continue to implement physical distancing and travel and hygiene measures to protect employees and members of the community. Continuing with these works is critical to ensuring project continuity, and the project team will continue to review and assess activities in line with any further updates.

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Detail of day work (along rail corridor from Hurlstone Park to Canterbury)

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Lane closure at Wairoa Street, Canterbury:

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Out-of-hours work

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Date / time	Detail of work (along the rail corridor from Hurlstone Park to Canterbury)
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Keeping you informed

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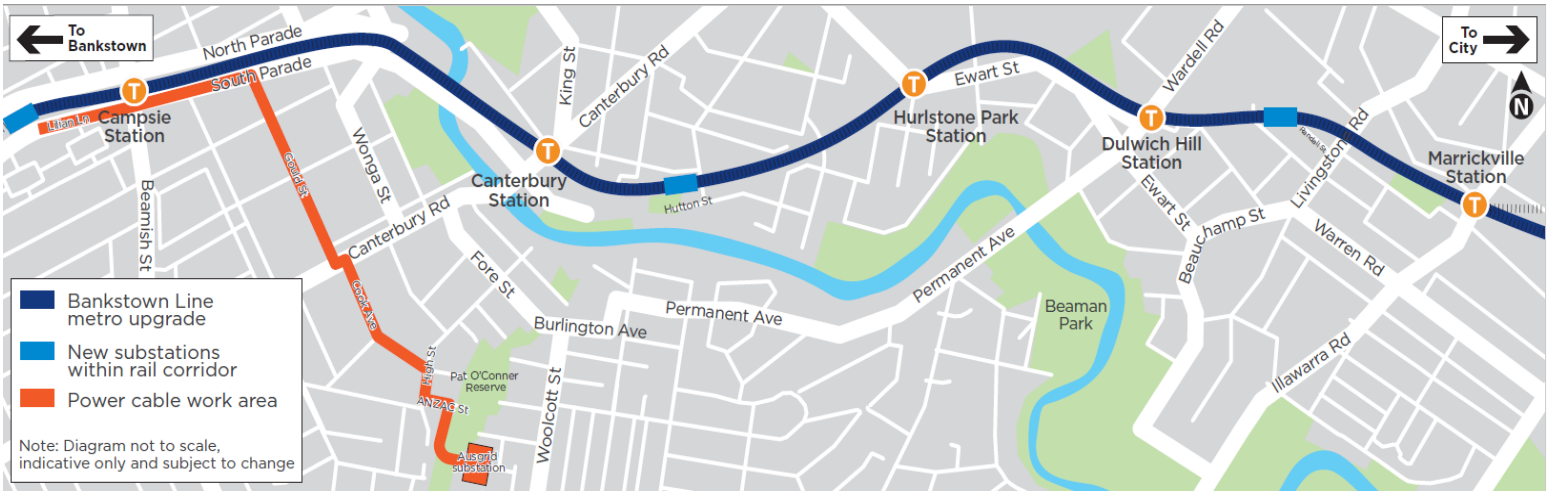

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City & Southwest

Notification - Bankstown Line metro upgrade

□□tober 2020

Sydney Metro is Australia's biggest public transport project.

Services started in May 2019 in the city's North West with a train e□er□□o□r minu□es in t□e pe□k. Metro r□l□□ll be e□te□ded □to t□e CBD an□ d be□o□d to Banks□own in 2024. □□ere □ll be new CBD □etro r□l□□□ □t□to□□ □□dergro□□d □t M□rt□ □l□□e, □tt □treet □□d □□r□g□roo □□d □e□ □etro □l□tor□ □□t □e□tr□l.

In 2024, Sy□dney □ll □□□e 31 □etro r□l□□□ □t□to□□ and a 66 km □t□□d□lo□e □etro r□l□□□ sys□em – t□e b□gge□t urban r□l□ro□e□t in Aus□ralian □□□tor. □□ere □ll be □lt□ □te capac□ty □or a □etro train e□er□t□o minu□es in each d□re□t□o □□der t□e Sy□dney □t□ □e□tre. Th□e □□gr□de o□ t□e T3 Banks□own □□□e to □etro □t□□d□rd bet□ee□ Sy□denham an□d Banks□own re□e□□ed planni□g □□□ro□□l o□ 19 □e□e□ber 2018.

Sydney Metro will continue to undertake work across its projects in accordance with current Government advice, and will continue to implement physical distancing and travel and hygiene measures to protect employees and members of the community. Continuing with these works is critical to ensuring project continuity, and the project team will continue to review and assess activities in line with any further updates.

In □□tober, e□rl□□or□ □ll □o□t□□□e □lo□g t□e T3 Banks□own Lin□e (□e□t□er and □te □o□d□to□□ □er□ □tt□g). Acc□ess to t□e r□l□orridor □ll be via e□□t□g □orridor/□ede□tr□□ acc□ess g□te□. Day □or□ □ll be d□r□g **project standard construction hours Monday to Friday 7am-6pm and Saturday 8am-6pm.**

Detail of day work

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- □□□t□ll□t□o□ o□ele□tr□□l □o□d□t□□t **Duke Street footbridge**, Camps□e. This □□□l□de□ **closure of the footbridge between 8-22 October 2020 and temporary removal of several car spaces along South Parade** (a t□rgeted □ot□□□t□o□ □ll be □e□t to re□de□t□)
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- □ or□□or **power supply cable installation along Lilian Lane and Lilian Street**. □□t□□te□ □ll □□□l□de:
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- Ea□ly □or□□or t□e **Campsie substation site, near Lillian Street, west of Lillian Lane** in □re□□r□to□ □or □o□tr□□to□. This □ll □□□l□de □r□e□ □□d e□□□□□to□ □or, □eget□t□o□ mana□gem□nt and □te e□t□bl□□□□e□t inc□uding □□t□ll□t□o□ o□□or□ □□□l□t□e, □erb□g □□d e□□□g.

Out-of-hours work

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Date / time	Location	Detail of work
Four shifts bet□ee□ **Monday 12 October** □□d **Friday 23 October** fro□ **8pm to 5am**	□□□ □□e □□b□t□to□ □te□□e□r □ll□□□ □treet□ □e□t o□□ll□□□ □□□e □e□r □□□ □□e □t□to□	• □ole del□□er□ • □□t□g e□□□□□e□t □□to □□□e • □□□t□ll□to□ □□d re□o□□l o□te□ □or□ge□er□tor
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□□tober 2020

Sydney Metro is Australia's biggest public transport project.

Services started in May 2019 in the city's North West with a train every four minutes in the peak. Metro rail will be extended □to t□e □□□ □□d be□o□d to □□□□□to□□ □□ 202□□□□ere □ill be □e□ □□□□ □etro r□l□□□ □t□to□□ □□dergro□□d □t M□rt□ □l□□e□□tt □treet □□d □□r□g□roo □□d □e□ □etro □l□tor□ □□t □e□tr□□

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Sydney Metro will continue to undertake work across its projects in accordance with current Government advice, and will continue to implement physical distancing and travel and hygiene measures to protect employees and members of the community. Continuing with these works is critical to ensuring project continuity, and the project team will continue to review and assess activities in line with any further updates.

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Day work

□ or□ □□ll be □□rr□ed o□t d□r□g **project standard construction hours Monday to Friday 7am - 6pm and Saturday 8am - 6pm.**

Location	Detail
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Out-of-hours work

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Date / time	Detail of work (along the rail corridor from Sydenham to Campsie)
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Keeping you informed

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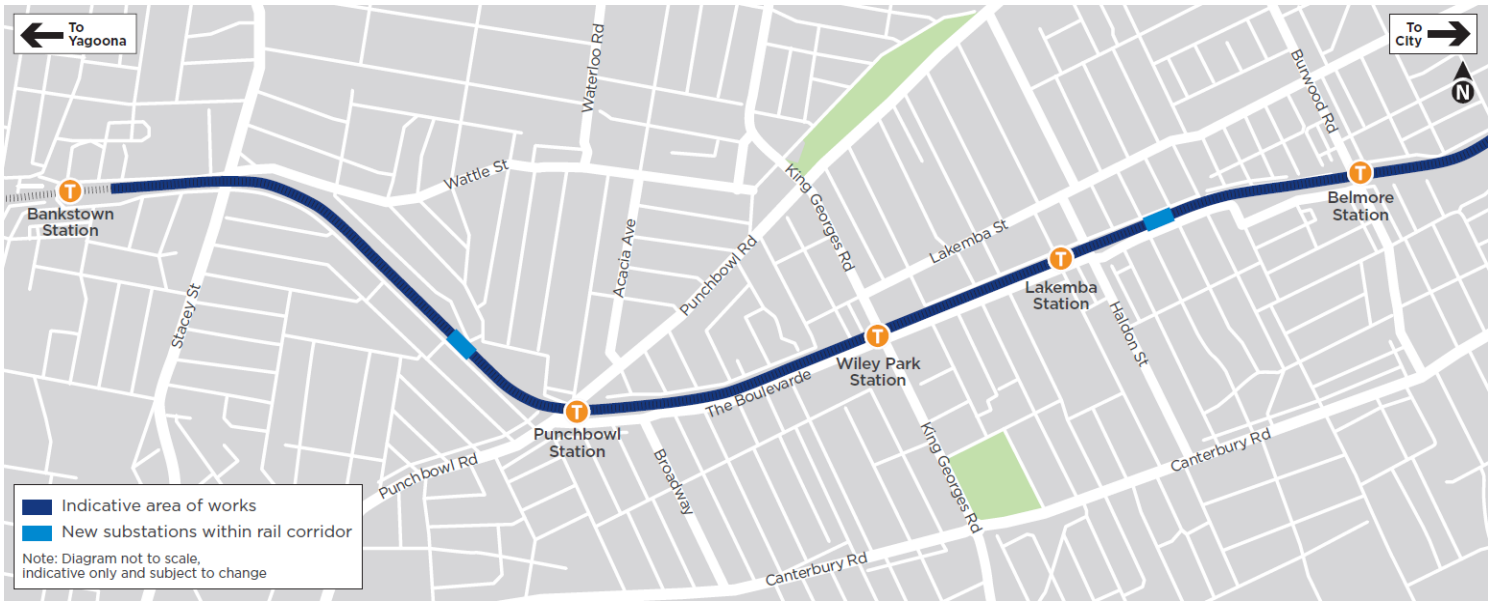

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Appendix 4: Environmental Representative Supporting Letter

Appendix 5: Heritage Impact Assessment

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Re: Sydney Metro City and Southwest Design – Heritage Impact Assessment (HIA) for investigative excavation works

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(b) investigations including investigative drilling and excavation.

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- *Sydney Metro City & Southwest – Sydenham to Bankstown Non-Aboriginal Heritage Impact Assessment* □□rte□□□t 201□□
- *Sydney Metro City & Southwest – Sydenham to Bankstown Historical Archaeological Assessment & Research Design* □□□□□□rte□□t 201□□

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Table 1. Heritage listings within the project area

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Physical heritage impacts

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Visual heritage impacts

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Figure 1. Proposed trench locations and heritage curtilages at Marrickville Station

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Physical heritage impacts

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Visual heritage impacts

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Table 2. Heritage impact assessment for track slab investigations

Item	Direct impacts	Visual impacts
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Item	Direct impacts	Visual impacts
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Hurlstone Park Railway Station Group	□□e □ro□o□ed □or□□ □t Hⅈrl□to□e □□r□ □□l□□□ □t□t□o□ □o□d □□□ol□e t□e e□□□□□t□o□ o□10 □ □□□□□e e□□□□□ted te□t □t□□1 bore□ole□□□d 10 □□□□ □t□ □t□□□ t□e b□ll□□ted r□l□orr□dor o□□l□tor□ 1 □□d 2□□□e□e □or□□ □o□d □ot re□□lt □□ dⅈre□t □□ □□□t□to t□e □l□tor□ □o□□g□ □l□tor□ b□ld□g□or □□□□ □dd□tio□□l r□l□ □□r□□tr□□t□re o□□er□t□ge □g□□□□□□□e□	□□e □ro□o□ed □□e□tg□t□e □or□□ □or t□e □o□□ble tr□□□ □l□b □t□□□ t□e r□l□orr□dor □o□d re□□lt □□te□ □or□r□d□t□rb□□□e to t□e b□ll□□ted r□l□tr□□□□Ho□e□er□t □□ □□□□□□ed t□□t t□e □□r□□□e □o□d be re□□□t□ted to t□ □re□e□□t□g □o□d□tio□ □ollo□□g □o□ □let□o□ o□□or□□ □□d t□ere□ore □o□d □ot re□□lt □□ □□□□ □er□ □□e□t □□□□□l □□ □□□t□□ □□er□ll□t□e □ro□o□ed □or□□ □o□d re□□lt □□ □ **neutral** □□□□□l □□ □□□t to t□e □g□□□□□□□e o□t□e Hⅈrl□to□e □□r□ □□l□□□ □t□t□o□ □ro□□□
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Lakemba Railway Station Group	□□e □ro□o□ed □or□□ □t □□□e□b□ □□l□□□ □t□t□o□ □o□d □□□ol□e □ □ □□□□□□e	□□e □ro□o□ed □□e□tg□t□e □or□□ □or t□e □o□□ble tr□□□ □l□b □t□□□ t□e r□l□orr□dor

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Table 3: Archaeological impact assessment for investigations at Marrickville Station

Investigation area	Potential archaeological remains	Archaeological impact assessment	AMZ and proposed management
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Investigation area	Potential archaeological remains	Archaeological impact assessment	AMZ and proposed management
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HV4 – lo□□ted □lo□g t□e □e□ter□ □de o□□l□tor□ 2□ to t□e e□□t o□t□e □or□er □□r□el□ o□□□e □□d □e□t o□ t□e □l□tor□ 2 b□ld□□g	Moder□te to □g□ □ote□t□l □or lo□□ll□ □g□□□□□t re□ □□□□ rel□ted to □□□□e 2 □1□□0 – 1□20□o□ M□rr□□□□lle □t□t□o□ r□il□ □□□ □□n□tr□□t□re □□□□ □□ □□l□ert□□□er□□ □□ □er□□e □t□□□t□litie□ □□□□ □□ □ood□t□□e □e□er or □er□□ □□ □□□e□□br□□ dr□□□ge □t□ □□d □ol□ted □rte□□t de□o□t□□□	□□□□H□ te□t tre□□□ □□lo□□ted □t□□□ t□e □□□□□□lted □l□tor□ □o □□o□□ □g□□□□□t □tr□□t□r□ re□ □□□□ □re □red□□ted to be □□t□□□ lo□□t□o□□ □ □ile t□□□ □□lo□□ted □t□□□ □□ □re□o□ □oder□te to □g□ □r□□□eolog□□□l □ote□t□□l□t □□ □ot □o□□dered l□el□t□□t □ol□ted □rte□□t de□o□t□ □o□ld be □re□e□t □t□□□ t□e e□□t□□g regr□ded □l□tor□ □ □□t□ere □re □o de□t□□ed □or□er □tr□□t□re□ □□ t□□□lo□□t□o□□t□e □□ □□□t to □r□□□eolog□□□l re□o□r□e□ro□ H□□ □□ □o□□dered □□	□M□ 1 – □re□□r□t□o□ o□ □□ □M□□□□t □r□□□eolog□□□l □o□tor□□g □□d □□l□□ge □□ re□□□red□
HV5 – lo□□ted □lo□g t□e e□□ter□ □de o□□l□tor□ 2□ to t□e e□□t o□t□e □l□tor□ 2 b□ld□□g	Moder□te to □g□ □ote□t□l □or lo□□ll□ □g□□□□□t re□ □□□□ rel□ted to □□□□e 2 □1□□0 – 1□20□o□ M□rr□□□□lle □t□t□o□ r□il□ □□□ □□n□tr□□t□re □□□□ □□ □□l□ert□□□er□□ □□ □er□□e □t□□□t□litie□ □□□□ □□ □ood□t□□e □e□er or □er□□ □□ □□□e□□br□□ dr□□□ge □t□ □□d □ol□ted □rte□□t de□o□t□□□	□□□□H□ te□t tre□□□ □□lo□□ted □t□□□ t□e □□□□□□lted □l□tor□ □o □□o□□ □g□□□□□t □tr□□t□r□ re□ □□□□ □re □red□□ted to be □□t□□□ lo□□t□o□□ □ □ile t□□□ □□lo□□ted □t□□□ □□ □re□o□ □oder□te to □g□ □r□□□eolog□□□l □ote□t□□l□t □□ □ot □o□□dered l□el□t□□t □ol□ted □rte□□t de□o□t□ □o□ld be □re□e□t □t□□□ t□e e□□t□□g regr□ded □l□tor□ □ □□t□ere □re □o de□t□□ed □or□er □tr□□t□re□ □□ t□□□lo□□t□o□□t□e □□ □□□t to □r□□□eolog□□□l re□o□r□e□ro□ H□□ □□ □o□□dered □□	□M□ 1 – □re□□r□t□o□ o□ □□ □M□□□□t □r□□□eolog□□□l □o□tor□□g □□d □□l□□ge □□ re□□□red□

Investigation area	Potential archaeological remains	Archaeological impact assessment	AMZ and proposed management
HV6 – lo□□ted □lo□g t□e e□□ter□ □de o□□l□tor□ 2□ to t□e e□□t o□t□e □l□tor□ 2 b□ld□g □□d e□□t o□H□□	Moder□te to □g□ □ote□t□l □or lo□□ll□ □g□□□□□□t re□ □□□□ rel□ted to □□□□e 2 □1□□0 – 1□20□o□ M□rr□□□□lle □t□t□o□ r□l□ □□□ □□n□tr□□t□re □□□□ □□ □□l□ert□□□er□□ □□ □er□□e □t□□□t□litie□ □□□□ □□ □ood□t□□e □e□er or □er□□ □□ □□□e□□br□□ dr□□□ge □t□ □□d □ol□ted □rte□□t de□o□t□□	□□□□H□ te□t tre□□□ □□lo□□ted □t□□□ t□e □□□□□□lted □l□tor□ □□o □□o□□ □g□□□□□□t □tr□□t□r□l re□ □□□□ □re □red□□ted to be □□t□□□ lo□□t□o□□ □ □□le t□□□ □□lo□□ted □t□□□ □□ □re□o□ □oder□te to □g□ □r□□□eolog□□□l □ote□t□□l□t □□ □ot □o□□dered l□el□t□□t □ol□ted □rte□□t de□o□t□ □o□ld be □re□e□t □t□□□ t□e e□□t□□g regr□ded □l□tor□ □ □□t□ere □re □o de□t□□ed □or□er □tr□□t□re□ □□ t□□□lo□□t□o□□t□e □□ □□□t to □r□□□eolog□□□l re□o□r□e□ro□ H□□ □□ □o□□dered □□l	□M□ 1 – □re□□r□t□o□ o□□□□ □M□□□□t□ □r□□□eolog□□□l □o□tor□□g □□d □□l□□ge □□ re□□□red□
HV7 – lo□□ted □lo□g t□e e□□ter□ □de o□□l□tor□ 2□ to t□e e□□t o□t□e □l□tor□ 2 b□ld□g □□d e□□t o□H□□	Moder□te to □g□ □ote□t□l □or lo□□ll□ □g□□□□□□t re□ □□□□ rel□ted to □□□□e 2 □1□□0 – 1□20□o□ M□rr□□□□lle □t□t□o□ r□l□ □□□ □□n□tr□□t□re □□□□ □□ □□l□ert□□□er□□ □□ □er□□e □t□□□t□litie□ □□□□ □□ □ood□t□□e □e□er or □er□□ □□ □□□e□□br□□ dr□□□ge □t□ □□d □ol□ted □rte□□t de□o□t□□	□□□□H□ te□t tre□□□ □□lo□□ted □t□□□ t□e □□□□□□lted □l□tor□ □□o □□o□□ □g□□□□□□t □tr□□t□r□l re□ □□□□ □re □red□□ted to be □□t□□□ lo□□t□o□□ □ □□le t□□□ □□lo□□ted □t□□□ □□ □re□o□ □oder□te to □g□ □r□□□eolog□□□l □ote□t□□l□t □□ □ot □o□□dered l□el□t□□t □ol□ted □rte□□t de□o□t□ □o□ld be □re□e□t □t□□□ t□e e□□t□□g regr□ded □l□tor□ □ □□t□ere □re □o de□t□□ed □or□er □tr□□t□re□ □□ t□□□lo□□t□o□□t□e □□ □□□t to □r□□□eolog□□□l re□o□r□e□ro□ H□□ □□ □o□□dered □□l	□M□ 1 – □re□□r□t□o□ o□□□□ □M□□□□t□ □r□□□eolog□□□l □o□tor□□g □□d □□l□□ge □□ re□□□red□
Track slab geotechnical investigations	Moder□te to □g□ □ote□t□l □or □r□□□eolog□□□l re□ □□□□ ro□ t□e e□rl□ □□□□□e o□ r□l□□□ □□n□tr□□t□re □o□ld □□□l□de □□l□ert□□□er□□ □□ □er□□e □t□□br□□ dr□□□ge □t□□ele□tr□□□l □o□d□t□ □□d □t□□□t□□□□□o□b□□e□□ □lee□er□ □□d r□l□tr□□□□ □□e□e re□ □□□□ □ □□be o□ lo□□l □g□□□□□□□□e□	□ll □or□□ □o□ld be □o□d□□ted □t□□□ t□e r□l□ □orr□dor □t M□rr□□□□lle □t□t□o□□□or□er □tr□□t□re□or □rte□□t□be□r□g de□o□t□ □re □ot □red□□ted □□ t□e r□l□orr□dor □□t□□□ re□ □□□□bee□ o□er□t□g □□ □□ □□t□e r□l□ □□l□e □□□□e t□e l□e □□□ □□t □o□□tr□□ted □□ t□e 1□□0□□ □□□□□□t□o□ □or□□ □o□ld be □o□d□□ted □□ □□□ ro□ □□o□□ □□b□□r□□e □er□□e □o□d□t□ □□d □□ □□□t□ to □□o□□ br□□□b□rrel dr□□□ □□d □□l□ert□ □□ □ot □□t□□□□ted□ □□t□ere □re □o □□o□□ □or□er □r□□□eolog□□□l re□o□r□e□ □□ t□e □e□□l□ □od□□ed r□l□ □or□ □t□o□□t□e □□ □□□t to □r□□□eolog□□□l re□o□r□e□ □□ □o□□dered □eglig□ble□	□M□ 1 – □re□□r□t□o□ o□□□□ □M□□□□t□ □r□□□eolog□□□l □o□tor□□g □□d □□l□□ge □□ re□□□red□

Figure 2. Location of HV testing trenches within Archaeological Management Zones at Marrickville Station

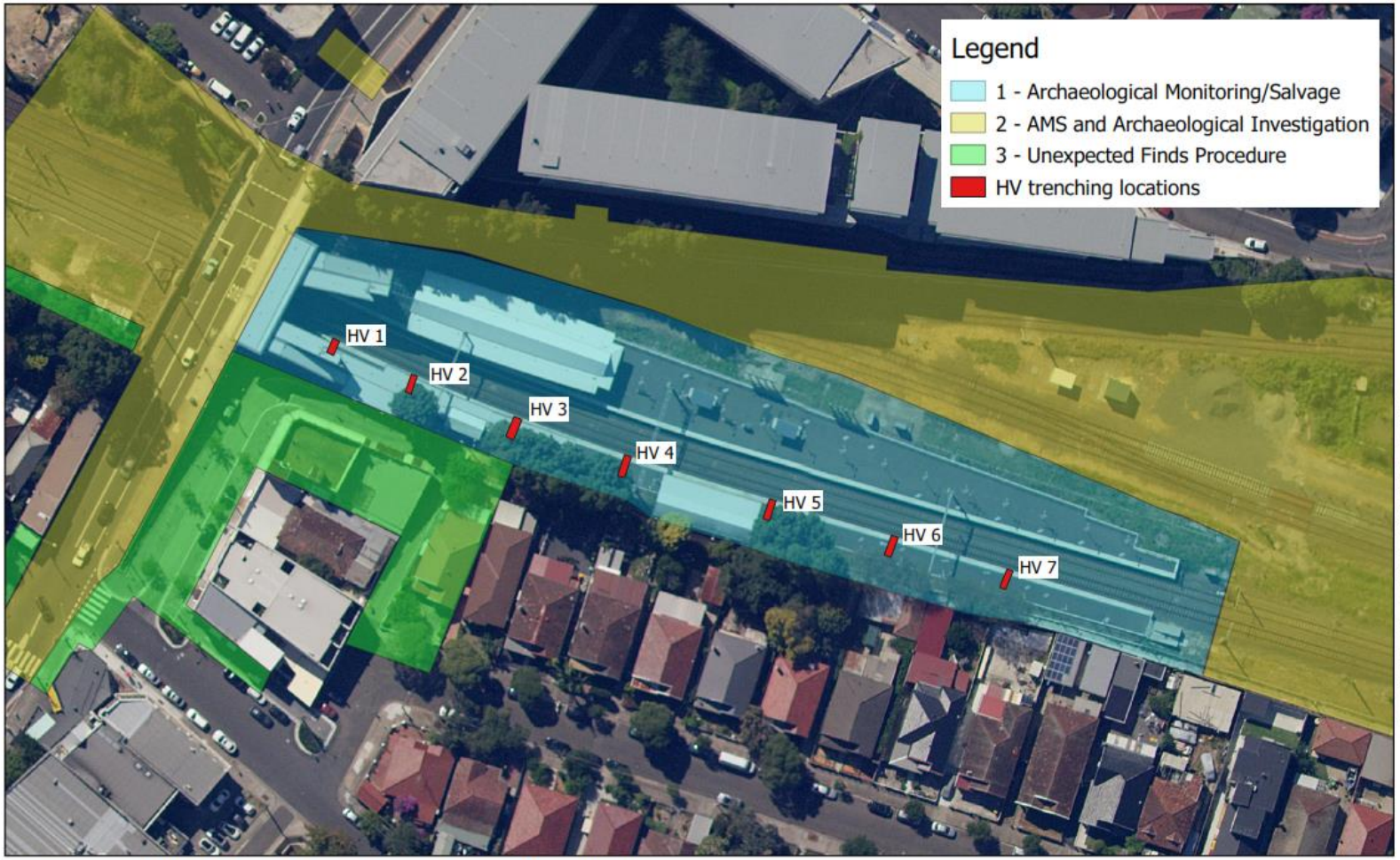

Figure 3. Marrickville proposed investigative works and Archaeological Management Zones

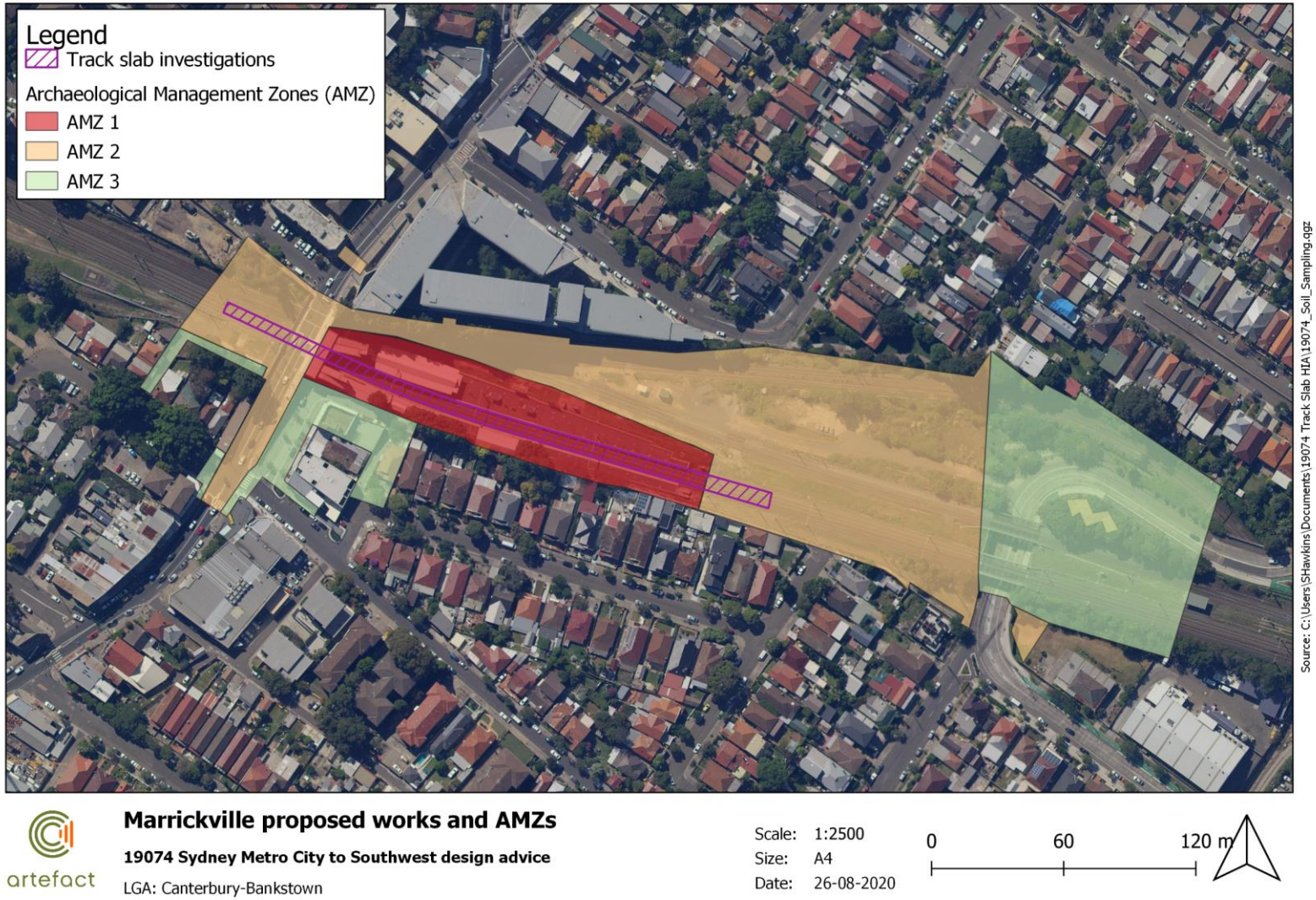

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Table 4. Archaeological impact assessment for investigations at Canterbury Station

Investigation area	Potential archaeological remains	Archaeological impact assessment	AMZ and proposed management
Track slab geotechnical investigations	Moder□te □ote□t□□l □or □r□□□eolog□□□l re□ □□□□ ro□ t□e e□rl□ □□□□e o□r□l□ □□ □□r□□tr□□t□re □o□ld □□□l□de □□l□ert□□□er□□ □□ □er□□□e □t□□ br□□□ dr□□□ge □t□□ ele□tr□□l □o□d□t□ □□d □t□□ t□□□□□o□ b□□e□□□lee□er□ □□d r□l tr□□□□□□e□e re□ □□□□ □ □□ be o□ □ote□t□□ll□lo□□l □g□□□□□□□e□	□ll □or□□ □o□ld be □o□d□□ted □t□□□ t□e r□l□ □orr□dor □t □□□terb□r□ □t□t□o□□□or□er □tr□□t□re□or □rte□□□t be□r□g de□o□t□ □re □ot □red□□ted □□ t□e r□l□ □orr□dor □□ t□□□ □re□ □□□□ bee□ o□er□t□g □□ □□ □□t□e r□l□ □□l□e □□□□e t□e l□e □ □□ □□t □o□□tr□□ted □□ t□e 1□□0□□ □□□□□□t□o□ □or□□ □o□ld be □o□d□□ted □□ □□ ro□ □□o□□ □□b□□r□□□e □er□□e □o□d□t□ □□d □□ □□□t□ to □□o□□ dr□□□ □□d □□l□ert□ □□ □ot □□t□□□□ted□ □□t□ere □re □o □□o□□ □or□er □r□□□eolog□□□l re□o□r□e□ □□ t□e □e□□□l□ □od□□ed r□l□or□ □t□o□□t□e □□ □□□t to □r□□□eolog□□□l re□o□r□e□ □□ □o□□dered □eg□g□ble□	□M□ 2 □re□□r□t□o□o□□□ □M□ □□d □r□□□eolog□□□l □□□e□t□g□t□o□

Investigation area	Potential archaeological remains	Archaeological impact assessment	AMZ and proposed management
Subsurface material test excavation (Platform 2)	Moder□te □ote□t□□l □or □r□□□eolog□□□l re□ □□□□ □ro□ t□e e□rl□ □□□□e o□r□l□ □□ □□r□□tr□□t□re □□ote□t□□ll□ □□□l□d□g □□l□ert□□□er□□e □t□□dr□□□□ge □t□□ele□tr□□□l □o□d□t□ □□d □t□□□□e□e re□ □□□□ □ □□be o□lo□□l □g□□□□□□□e□	□ob□□t □r□□□eolog□□□l re□ □□□□ □re □ot □□t□□□□ted to be lo□□ted belo□ t□e □l□tor□ 2 □□r□□□e□□t□ t□e e□□e□to□ o□□ote□t□l □ol□ted b□r□ed □ort□o□□ o□□□r□□tr□□t□re □□□□ □□boot□□r□□er□ □e□r t□e □l□tor□ 2 b□ld□g□ □l□tor□ e□□□□□to□ □or□□ □o□ld be lo□□ted □□ □□ ro□ □re□□o□ □□o□□ □er□□e□□□□□l□d□g t□e □□□ □□e br□□□ b□rrel dr□□□ belo□ □l□tor□ 2□ □□b□□r□□□e □tr□□t□r□l □□d □rte□□□t□□l re□ □□□□ □re □ot □□t□□□□ted to be lo□□ted □t□□□ t□e gro□□d d□□t□rb□□g □or□□□□□d t□e □□ □□□t□ to □r□□□eolog□□□l re□ □□□□ □o□ld be □egl□gible□	□M□ 2 □re□□r□t□o□o□□□ □M□ □□d □r□□□eolog□□□l □□□e□t□g□t□o□

Figure 4. Canterbury proposed works and AMZs

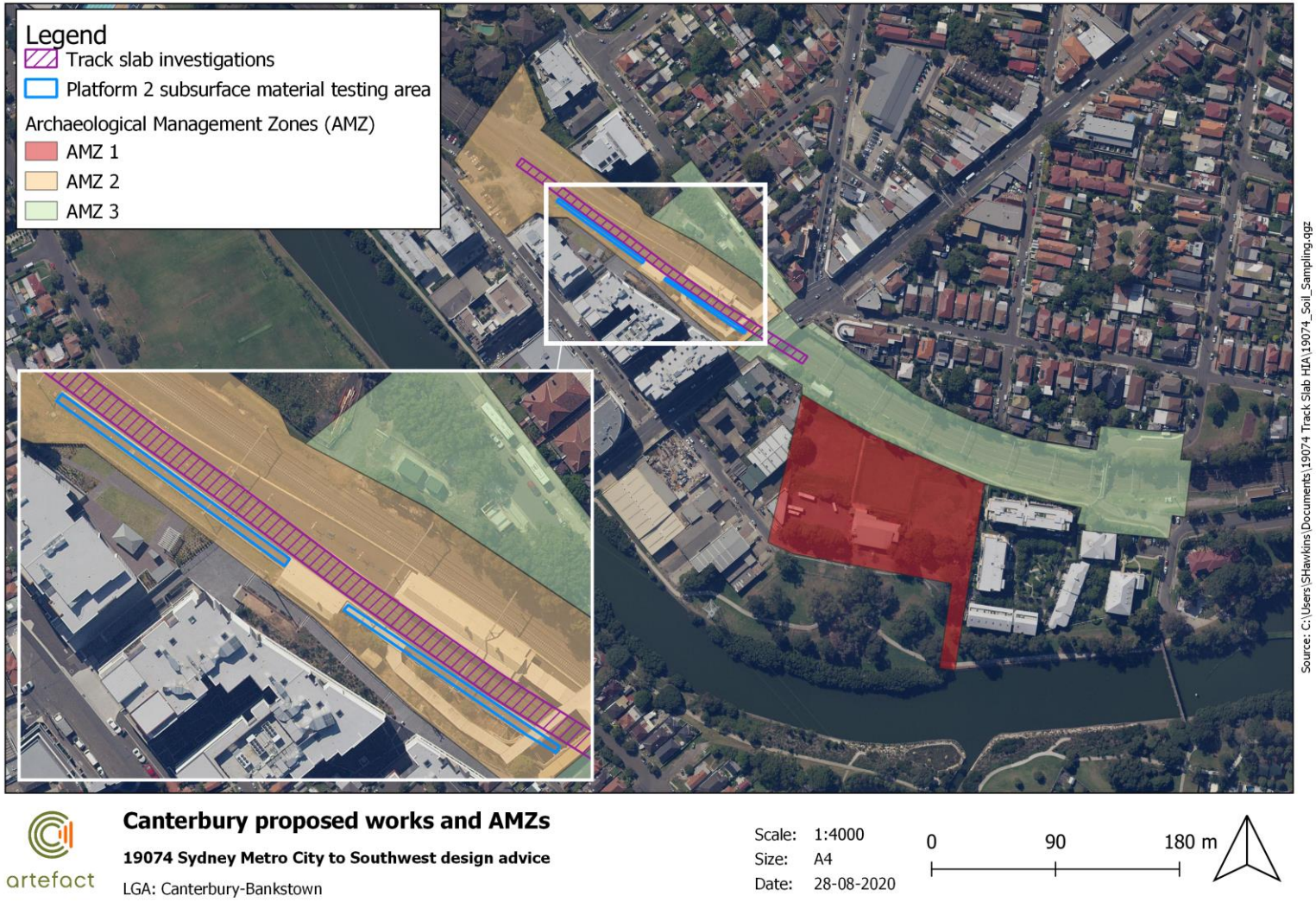

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Table 5. Archaeological impact assessment for investigations at Belmore Station

Investigation area	Potential archaeological remains	Archaeological impact assessment	AMZ and proposed management
Track slab geotechnical investigations (east of Burwood Road)	Moder□te □ote□t□□l □or □r□□□eolog□□□l re□ □□□□ □□□o□□ted □t□ □□gr□de□to t□e tr□□□ □t□to□□□□ l□□el□to re□□□ t□e t□re□□old o□lo□□l □g□□□□□□□e□	□e□□□t□e lo□□t□o□□ o□ t□e te□t □t□ □□d tr□□□ □ll □or□□ □o□ld be □o□d□□ted □t□□□□ t□e r□□l □orr□dor □t □□□terb□r□ □t□to□□□□or□er □tr□□t□re□or □rte□□□t be□r□□g de□o□t□ □re □ot □red□□ted □□ t□e r□□l □orr□dor □□ t□□□ □re□ □□□□bee□ o□er□t□□g □□ □□ □□t□e r□□l□□□ l□□e □□□□e t□e l□□e □□□□ □□t □o□□tr□□ted □□ t□e 1□□0□□ □□□□□□□t□o□ □or□□ □o□ld be □o□d□□ted □□ □□ □ro□ □□o□□ □□b□r□□□e □er□□e □o□d□t□ □□d □□ □□□t□ to □□o□□ dr□□□□ □□d □□l□ert□ □□ □ot □□t□□□□□ted□ □□t□ere □re □o □□o□□ □or□er □r□□□eolog□□□l re□o□r□e□ □□ t□e □e□□l□ □od□□ed r□l□or□ □to□□t□e □□ □□□t to □r□□□eolog□□□l re□o□r□e□ □□ □o□□dered □□l□	□M□ □– □e□□e□ted □□d□ □ro□ed□re
Track slab geotechnical investigations (west of Burwood Road)	□o□ to □oder□te □ote□t□□l □or e□rl□ □□r□□tr□□t□re re□ □□□□ □□□□□ □□ □er□□ □□ □□□e□□ □lee□er□□□o□d□t□ □□d dr□□□□ge □t□□□□o□ to □oder□te □ote□t□□l □or re□ □□□□ □□□o□□ted □t□ t□e □or□er □□ed □e□r □ortle□ □treet□□□e□e re□ □□□□ □ □□ be o□lo□□l □g□□□□□□□e□	□□ □or□□ □o□ld be □o□d□□ted □t□□□□ t□e r□□l □orr□dor □t □□□terb□r□ □t□to□□□□or□er □tr□□t□re□or □rte□□□t be□r□□g de□o□t□ □re □ot □red□□ted □□ t□e r□□l □orr□dor □□ t□□□ □re□ □□□□bee□ o□er□t□□g □□ □□ □□t□e r□□l□□□ l□□e □□□□e t□e l□□e □□□□ □□t □o□□tr□□ted □□ t□e 1□□0□□ □□□□□□□t□o□ □or□□ □o□ld be □o□d□□ted □□ □□ □ro□ □□o□□ □□b□r□□□e □er□□e □o□d□t□ □□d □□ □□□t□ to □□o□□ dr□□□□ □□d □□l□ert□ □□ □ot □□t□□□□□ted□ □□t□ere □re □o □□o□□ □or□er □r□□□eolog□□□l re□o□r□e□ □□ t□e □e□□l□ □od□□ed r□l□or□ □to□□t□e □□ □□□t to □r□□□eolog□□□l re□o□r□e□ □□ □o□□dered □eg□g□ble□	□M□ 2 □re□□r□t□o□ o□□□ □M□ □□d □r□□□eolog□□□l □□□e□tg□to□

Figure 5. Belmore proposed works and AMZs

artefact

Belmore proposed works and AMZs

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Table 6. Archaeological impact assessment for Lakemba Station

Investigation area	Potential archaeological remains	Archaeological impact assessment	AMZ and proposed management
Track slab geotechnical investigations	□o□ to □oder□te □ote□t□□l □or □r□□□eolog□□□l re□ □□□□ □□□o□□ted □t□ t□e □r□t t□□ber □l□□d □l□t□or□ □□d □□t□□l r□ll□□ □□ □□r□□tr□□t□re □□□□□ □□ br□□□ dr□□□□ge □t□□ □o□d□t□□□t□□□□□o□ b□□e□□ t□□ber □oot□□g□ □□d □o□t□ole□ □lee□er□ □□d r□ll□tr□□□□	□ote□t□□l □r□□□eolog□□□l re□ □□□□ □□□l□d□□g r□ll□□□ □□□r□□tr□□t□re □□d □or□er t□□ber □l□t□or□ □ □re □□do□□□e□ted □□d e□□□t lo□□t□o□□ o□t□e□e e□t□re□ □re □ot □□o□□□□t □□ □ot □o□□□dered l□□el□t□□□t e□□e□ er□l □r□□□eolog□□□l □e□t□re□ □o□ld re□ □□□ □t□□□ t□e □e□□□l□ □od□□ed r□ll□or□ □t□o□□ □or□er □tr□□t□re□o□□rte□□□t□be□r□□g de□o□t□ □re □ot □red□□ted □□ t□□□ □re□□	□M□ 2 □re□□r□t□o□ o□□□□ □M□ □□d □r□□□eolog□□□l □□□e□tg□t□o□
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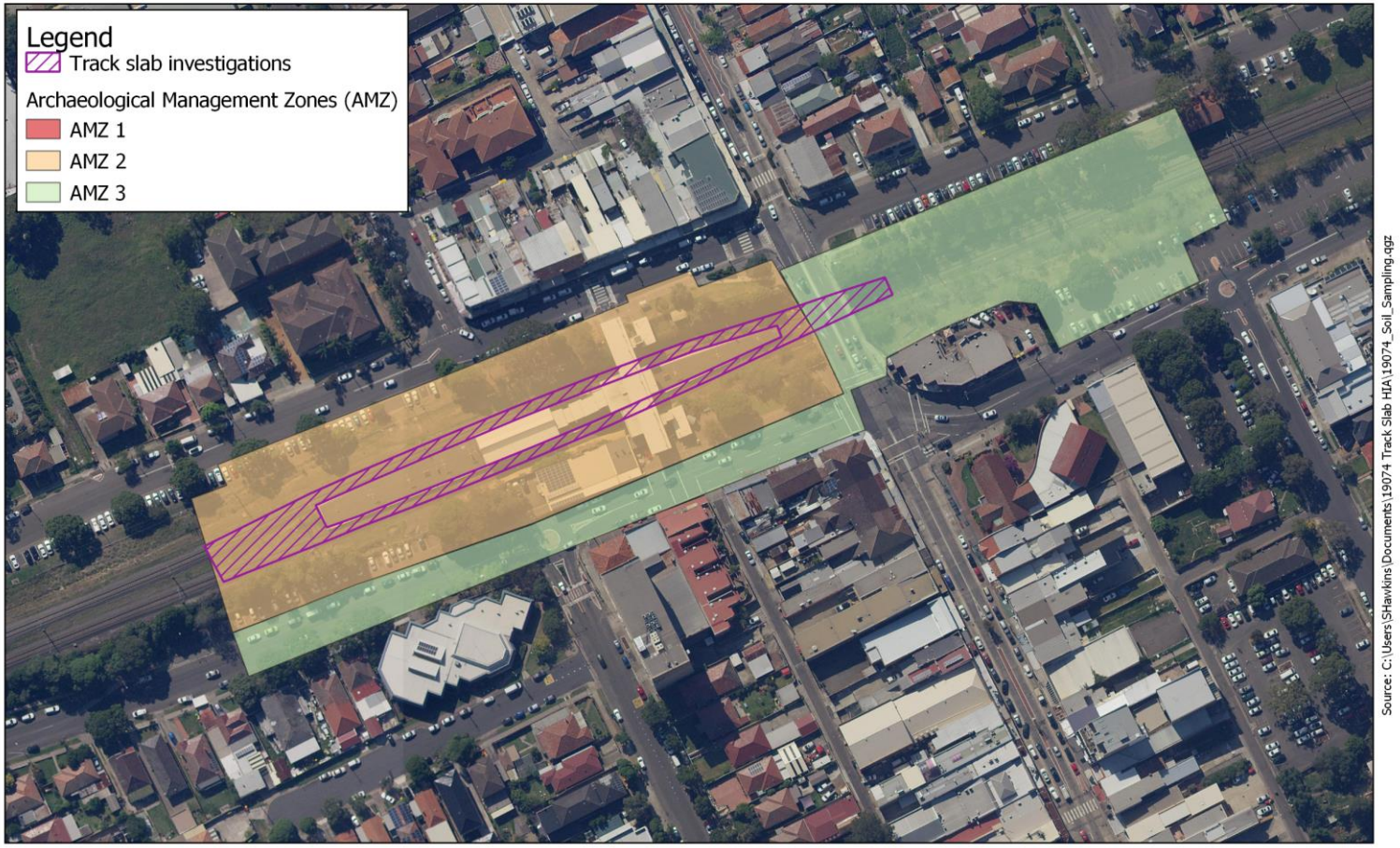
Figure 6. Lakemba proposed works and AMZs



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“An AMS would be prepared prior to construction works with the potential to impact archaeological resources.”[3]

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artefact

2 October 2020

Ben Fethers
Environmental Consultant
Metron T2M

Dear Mr Fethers,

Re: Sydney Metro City and Southwest Design – Heritage Impact Assessment (HIA) for investigative excavation works

The proposed Sydney Metro City and Southwest project (the project) involves upgrading the 10 existing stations from Marrickville to Bankstown (inclusive), and the 13 kilometre long section of the Sydney Trains T3 Bankstown Line between west of Sydenham Station and west of Bankstown Station, to improve accessibility for customers and enable conversion of the line to metro standards. The project would enable Sydney Metro to operate beyond Sydenham, to Bankstown.

As part of the preparation of the Environmental Impact Statement (EIS) and Submissions and Preferred Infrastructure Report (SPIR), Artefact Heritage (Artefact) prepared non-Aboriginal archaeological assessments which outlined areas of potential significant non-Aboriginal archaeological remains at several of the stations on the T3 Bankstown Line.

The Critical State Significant Infrastructure (CSSI) project was approved by the Minister for Planning on 12 December 2018 (SSI 8256). As part of the Revised Environmental Mitigation Measures (REMMs) for the project, NAH12 indicates that mitigation measures outlined in the non-Aboriginal archaeological assessments[1] for the project must be adhered to during design, investigation and construction works for the project.

Prior to the preparation of a Construction Environmental Management Plan the project determination designated specific investigation work as Low Impact Activities which are defined as activities which are not construction, but which include:

> *(b) investigations including investigative drilling and excavation.*

Where Low Impact Activities would occur within areas included within the curtilage of items listed on the State Heritage Register (SHR) or within areas of known or expected archaeological potential, consultation with Heritage NSW must be conducted prior to the Low Impact Activities being approved.

As part of investigative works for the project, Metron T2M are have proposed to conduct a range of investigative works for services location and geotechnical investigation at several stations. The following investigative works were assessed in a Heritage Impact Assessment (HIA) memo prepared by Artefact on 28 August 2020:

[1] Artefact 2018a. *Sydney Metro City & Southwest Sydenham to Bankstown Upgrade – Submissions and Preferred Infrastructure Report Non-Aboriginal Heritage Assessment.* Report to Transport for NSW; Artefact 2018b. *Sydney Metro City & Southwest Sydenham to Bankstown Upgrade – Historical Archaeological Assessment & Research Design.* Report to Transport for NSW.

- High voltage (HV) electricity service identification, involving slit trenching (approximately 1 m by 0.2 m in width and between 1.0 m and 1.5 m deep) on platform 2 at Marrickville station.
- Subsurface material investigations are proposed on platform 2 at Canterbury Station. Investigation would be conducted to identify the depth and variation of the rock profile below the platform surface to inform design for future works.
- Geotechnical investigations within the rail formation across a number of stations to determine subgrade conditions to inform future track slab installation methodologies.

As the investigative works involved works within the curtilage of SHR listed items, as well as in areas of predicted archaeological potential, the August 2020 HIA memo was provided to Heritage NSW for their consultation and comment.

Since the preparation and submission of the HIA memo to Heritage NSW in August, several new ancillary works have been proposed to be conducted. The following memo assesses adverse heritage impacts from additional scope of work proposed under the August 2020 HIA and provides supplementary recommendations for minimising heritage impacts from the updated scope of work.

This addendum HIA must be read in conjunction with heritage significance and archaeological assessment information provided in the August 2020 HIA for the minor work investigation.

Proposed additional works

- Additional borehole investigations proposed for investigating subsurface conditions near to rail overbridge structures. Boreholes would be 100 mm in diameter and would be excavated at Marrickville, Dulwich Hill, Hurlstone Park, Canterbury, Campsie, Belmore and Lakemba Stations.
- Non-destructive digging (NDD) excavation for service investigation of electrical conduits at Campsie Station.

Authorship

This report was prepared by Sarah Hawkins (Heritage Consultant) with management input and review from Duncan Jones (Principal).

Heritage and archaeological impact assessment

Additional geotechnical boreholes

Geotechnical boreholes would be excavated at a number of locations throughout the project route to inform investigations on subsurface conditions near rail overbridges. Boreholes would be up to 100 mm in diameter. Following the completion of borehole excavation, all borehole locations would be made good and original surfaces reinstated (see recommendations below).

A detailed discussion of potential impacts from borehole investigations is provided in Table 1 below. As all surfaces would be made good following borehole excavation, all boreholes would be result in nil to negligible adverse visual heritage impacts.

The locations of boreholes at stations where archaeological remains have been predicted (Marrickville, Canterbury, Belmore and Lakemba stations) are shown in Figure 1 to Figure 4.

Table 1. Heritage impact assessment for geotechnical boreholes

Item	Direct impacts	Archaeological impacts
Marrickville Railway Station Group	The proposed borehole would be excavated within the rail corridor to the west of the Illawarra Road overbridge. No significant fabric would be modified or impact by the proposed borehole investigation. There would be **nil** direct adverse impacts to the heritage significance of Marrickville Station from the proposed works.	There are no specific documented former structures located within this borehole area and the investigation works would result in **negligible** impacts to significant archaeological remains. The proposed borehole is located within an area designated as AMZ 2. Borehole excavations in this location should be archaeologically monitored in accordance with the methodology outlined in the August 2020 HIA AMS.
Dulwich Hill Railway Station Group	The proposed borehole would be excavated within the rail corridor to the east of the Wardell Road overbridge. No significant fabric would be modified or impact by the proposed borehole investigation. There would be **nil** direct adverse impacts to the heritage significance of Dulwich Hill Station from the proposed works.	There are no predicted archaeological remains at Dulwich Hill Station and the proposed works would result in **nil** impacts to archaeological remains.
Hurlstone Park Railway Station Group	The proposed borehole would be excavated within the rail corridor to the west of the Duntroon Street overbridge. No significant fabric would be modified or impact by the proposed borehole investigation. There would be **nil** direct adverse impacts to the heritage significance of Hurlstone Park Station from the proposed works.	There are no predicted archaeological remains at Hurlstone Park Station and the proposed works would result in **nil** impacts to archaeological remains.
Canterbury Railway Station Group	The proposed borehole would be excavated within the rail corridor to the east of the Canterbury Road overbridge. No significant fabric would be modified or impact by the proposed borehole investigation. There would be **nil** direct adverse impacts to the heritage significance of Canterbury Station from the proposed works.	The proposed borehole at Canterbury Station would be excavated within an area with no predicted archaeological remains. The proposed works would result in **nil** impacts to significant archaeological remains. The borehole is located within an area designated as AMZ 3 and would be managed under the Sydney Metro Unexpected Finds Procedure. No archaeological monitoring would be required.

Item	Direct impacts	Archaeological impacts
Campsie Railway Station Group	The proposed borehole at Campsie Station would be located within the platform on platform 2, approximately 5 m to the west of the Beamish Street overbridge. The borehole would be located at least 1 m away from the brick retaining wall of the platform coping and would not impact any significant fabric. The proposed works would result in a **nil** direct impact to the heritage significance of Campsie Station	There are no predicted archaeological remains at Campsie Station and the proposed works would result in **nil** impacts to archaeological remains.
Belmore Railway Station Group	Two boreholes are proposed at Belmore Station. The first borehole is located on the corner of Burwood Road and Redman Parade, located within the concrete footpath to the east of the landscaped garden in that location. This borehole is located outside the SHR curtilage for the heritage item and would not impact significant fabric. The second borehole is located within a carpark to the south of the Burwood Road overbridge off Bridge Road. This borehole would be located within the SHR curtilage for the station, however no significant fabric would be impacted by the excavation. The proposed works would result in a **nil** impact to the heritage significance of Belmore Station.	The northern borehole is located in an area where no archaeological remains have been predicted and would result in a **nil** impact to significant archaeological remains. The southern borehole is located in an area where no specific former structures were located, within an area designated as AMZ 2 for potential former remains. The borehole excavation would result in **negligible** impacts to archaeological remains. The southern borehole is located within an area designated as AMZ 2 and should be archaeologically monitored in accordance with the AMS provisions outlined in the August 2020 HIA memo for the investigation works.
Lakemba Railway Station Group	Borehole excavation at Lakemba Station would be located in an area outside of the heritage curtilage of the item. The excavation would not impact significant fabric. The works would result in a **nil** impact to the heritage significance of Lakemba Station.	The borehole excavation is located in an area where no archaeological remains are predicted and outside of an area of required archaeological management for the project. The borehole would result in **nil** impacts to significant archaeological remains. The borehole excavation would be managed under the Sydney Metro Unexpected Finds Procedure.

Figure 1. Marrickville proposed investigative works and Archaeological Management Zones

Figure 2. Canterbury proposed works and AMZs

Figure 3. Belmore proposed works and AMZs

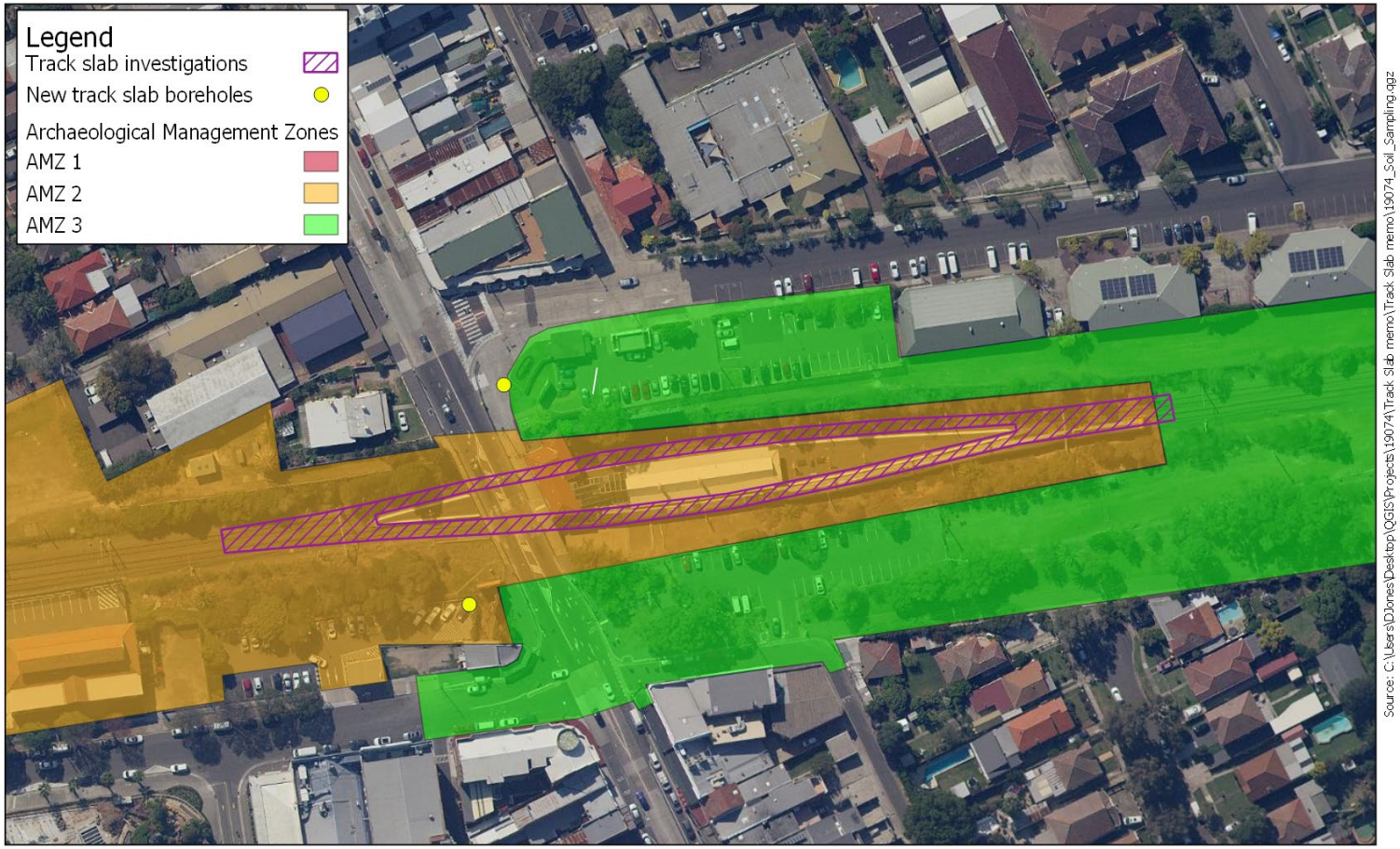
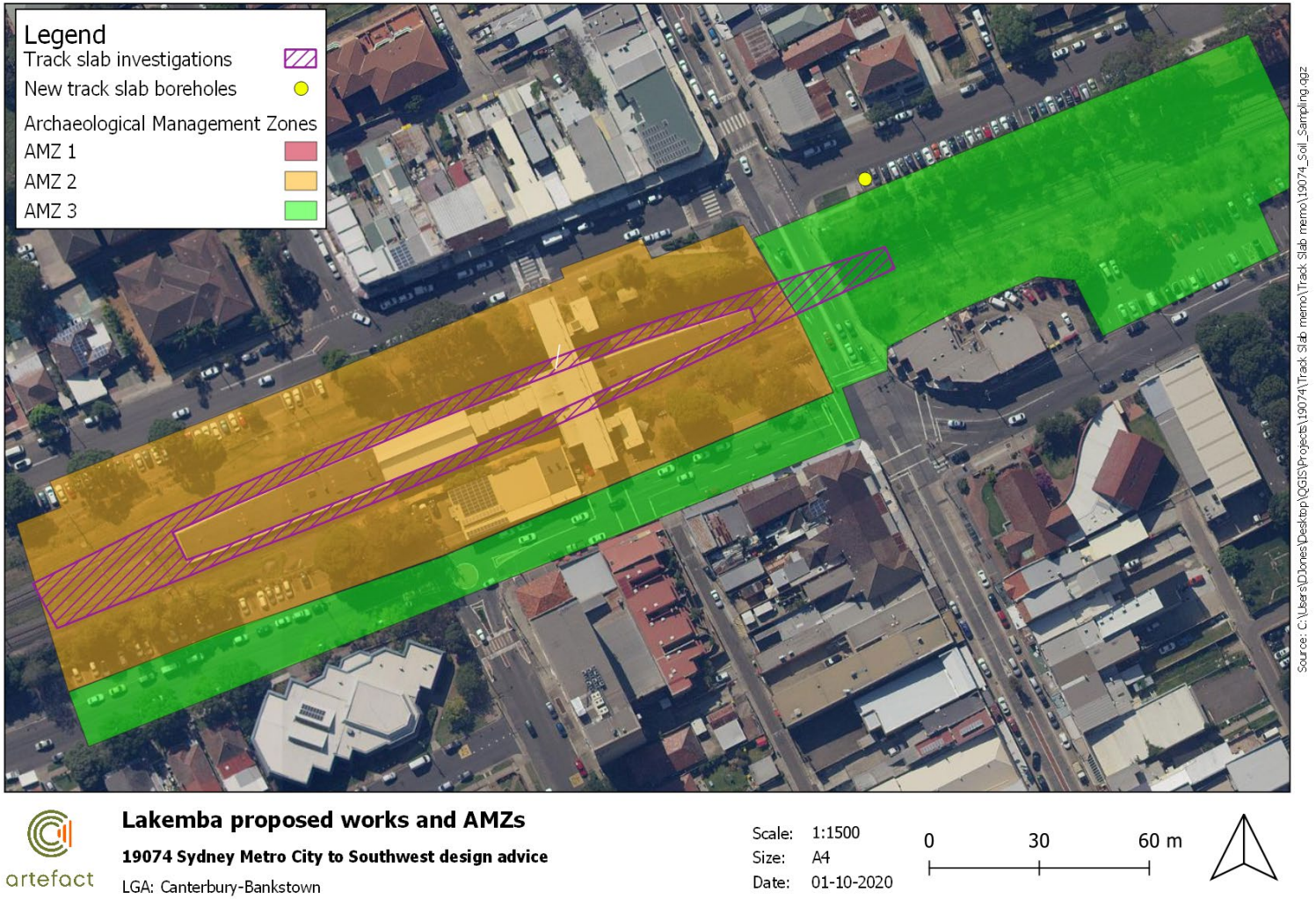


Figure 4. Lakemba proposed works and AMZs



Campsie Station service investigation

One NDD excavation area is proposed at Campsie Station, located within the Lilian Street Sydney Trains compound carpark, to the south of the railway corridor. This NDD work is located outside of all heritage curtilages for Campsie Station, and there is no significant heritage fabric located in the area of work. Following completion of the NDD service location works, the excavation area would be backfilled and made good. These works would result in a **nil** adverse direct and visual impact to the significance of Campsie Station.

There are no predicted significant archaeological remains at Campsie Station and the proposed NDD excavation works would result in a **nil** impact to significant archaeological remains. The NDD works would be managed under the Sydney Metro Unexpected Finds Procedure.

Conclusions and recommendations

Conclusions

The proposed additional geotechnical boreholes and NDD excavation work would not involve modifying or impacting any significant heritage fabric for the project. These works would result in **nil** direct and **nil to negligible** visual impacts to the heritage significance of listed items within the project area.

Two boreholes (the Marrickville Station borehole and the southern Belmore Station borehole) are located within areas designated as AMZ 2 within the SPIR ARD for the project. These boreholes should be archaeologically managed in accordance with the AMS prepared in the August 2020 HIA memo, and should be archaeologically monitored.

All other boreholes and NDD investigations assessed in this addendum HIA would be located in areas of either AMZ 3 (Unexpected Finds) or outside of the overall project area and should be managed under the Sydney Metro Unexpected Finds Procedure.

As these works would not increase the degree of adverse heritage impact assessed in the August 2020 HIA memo and are of the same scope of work (geotechnical investigation and service location), no further formal consultation with Heritage NSW would be required for the works to proceed. This addendum memo should be supplied to Heritage NSW for their records.

Recommendations

The additional works should be managed in accordance with all provisions and recommendations outlined in the August 2020 HIA for the overall investigative works program. The following additional recommendations are provided for the works:

- Excavation on platforms at Campsie Station should be conducted as far as reasonably possible away from significant fabric (such as platform coping, sandstone cuttings, brick retaining walls, steel trellises or station platform buildings). Should excavation occur near to these elements of significant fabric, fabric should be protected from splash excavation material during the works. This would ensure that outer surfaces are kept clean during works.
- Borehole excavation on hardstand surfaces must involve hand tools (power saw cutters or the like) to remove the hardstand prior to excavating with a borehole rig. This original

hardstand should be reinstated following excavation and made good to provide a seamless appearance in the hardstand.

- The northern borehole excavation area at Belmore Station is located within proximity to the landscaped gardens on the corner of Burwood Road and Redman Parade. Work crews are to avoid establishing equipment or material within the grassed area and must ensure that the grass and landscaped elements of the garden are not modified or damaged in any way during works.
- The program of archaeological monitoring outlined in the August 2020 HIA memo should be implemented for the borehole at Marrickville Station and for the southern borehole at Belmore Station. Archaeological monitoring at these locations must follow the provisions outlined in the AMS provided in the August 2020 HIA memo.

Appendix 6: Consultation with DPC Heritage

Fethers, Ben

From: Fethers, Ben
Sent: Friday, 16 October 2020 6:18 PM
To: Siobhan.Lavelle@environment.nsw.gov.au; heritagemailbox@environment.nsw.gov.au
Cc: Chris Dickson; Tim Solomon; Jonathan Steele; Samantha Craig; Patel, Ketan
Subject: FW: Sydney Metro City and Southwest - Sydenham to Bankstown Trains to Metro Upgrade - low impact investigation works at multiple stations
Attachments: SMC&SW service and geotechnical track slab testing addendum HIA.pdf

To whom it may concern,

Further to the previous correspondence regarding for investigative works for services location and geotechnical investigation at several stations, endorsed by your Department as being "low impact" (refer below), please find attached for your information an addendum to the original Heritage Impact Assessment (HIA). This addendum has been prepared to facilitate a minor amendment to realign several borehole locations.

As noted in the addendum HIA, the revised scope of work would not increase the degree of adverse heritage impact assessed in the August 2020 HIA memo, and are of the same scope of work (geotechnical investigation and service location) to that originally proposed and assessed.

The revised scope of works would be managed in accordance with all provisions and recommendations outlined in the August 2020 HIA for the overall investigative works program.

Due to the change in location of several boreholes (and proximities to areas to be protected) the following additional considerations are to be implemented during the works:

- Borehole excavation on hardstand surfaces must involve hand tools (power saw cutters or the like) to remove the hardstand prior to excavating with a borehole rig. This original hardstand should be reinstated following excavation and made good to provide a seamless appearance in the hardstand.
- The northern borehole excavation area at Belmore Station is located within proximity to the landscaped gardens on the corner of Burwood Road and Redman Parade. Work crews are to avoid establishing equipment or material within the grassed area and must ensure that the grass and landscaped elements of the garden are not modified or damaged in any way during works.
- The program of archaeological monitoring outlined in the August 2020 HIA memo should be implemented for the borehole at Marrickville Station and for the southern borehole at Belmore Station. Archaeological monitoring at these locations must follow the provisions outlined in the AMS provided in the August 2020 HIA memo.

The proposed works are planned to be undertaken over the weekend 24 and 25 October 2020. Please do not hesitate to contact me should you like to discuss further.

Regards,

Ben Fethers | Environmental Consultant | ben.fethers@arcadis.com
Arcadis | Level 16/580 George Street, Sydney | NSW 2000| Australia
T. +[redacted]
M. +[redacted]
www.arcadis.com

ARCADIS Design & Consultancy for natural and built assets

From: Siobhan Lavelle <Siobhan.Lavelle@environment.nsw.gov.au>
Sent: Tuesday, 15 September 2020 6:54 PM
To: Steele, Jonathan S <Jonathan.Steele@mottmac.com>
Cc: Cath Snelgrove <Cath.Snelgrove@transport.nsw.gov.au>; Tim Solomon <Tim.Solomon@transport.nsw.gov.au>; Duncan Jones <duncan.jones@artefact.net.au>; Saunders, Matt <Matt.Saunders@arcadis.com>; Fethers, Ben <Ben.Fethers@arcadis.com>
Subject: RE: Sydney Metro City and Southwest - Sydenham to Bankstown Trains to Metro Upgrade - low impact investigation works at multiple stations

OUR REF: DOC20/730459

Dear Mr Steele,

Thank you for your email dated 28 August 2020, regarding this project. Heritage NSW understands that the CSSI Project (SSI 8256, Sydenham to Bankstown) determined some activities as 'low impact' such as investigative drilling and excavation. Where Low Impact Activities would occur within areas included within the curtilage of items listed on the State Heritage Register (SHR) or within areas of known or expected archaeological potential, consultation with Heritage NSW must be conducted prior to the Low Impact Activities being approved.

A memo prepared by Artefact Heritage dated 28 August 2020 has described a range of activities proposed by Metron T2M at several locations for investigative works for services location and geotechnical investigation at several stations.

Proposed works are:

- High voltage (HV) electricity service identification, involving slit trenching (approximately 1 m by 0.2 m in width and between 1.0 m and 1.5 m deep) on platform 2 at Marrickville station. Excavation would be conducted in order to expose the concrete cover of the existing HV line. Testing would be conducted by either manual excavation or using high pressure water and vacuum suction (vacuum truck) non-destructive digging.
- Subsurface material investigations are proposed on platform 2 at Canterbury Station. Investigation would be conducted to identify the depth and variation of the rock profile below the platform surface to inform design for future works. Excavation work would be conducted by vacuum truck, involving a total of 10 excavation trenches of up to 0.5 m by 2.0 m in size. Excavation would conducted to the depth of any subsurface rock or to 2.0 m in depth.
- Geotechnical investigations within the rail formation to determine subgrade conditions to inform future track slab installation methodologies. Vacuum truck excavation to identify services would also be conducted. Investigation would be conducted at Marrickville, Dulwich Hill, Hurlstone Park, Canterbury, Campsie, Belmore, Lakemba and Punchbowl Stations. Works would consist of machine excavation, vacuum truck excavation and borehole excavation within the rail formation only.

Works would occur within the following listed heritage items:

- SHR – Marrickville Railway Station Group (SHR1186), Canterbury Railway Station Group(SHR1109)

- Local/S170 listed – Dulwich Hill, Hurlstone Park, Campsie, Belmore, Lakemba and Punchbowl (all Railway Station Groups)

Artefact Heritage advise p.3-4 that the works are unlikely to impact significant heritage fabric, and any works in the vicinity of the platform copings would be done using hand tools and/or vacuum truck excavation. More specific detail is provided in Table 2 of the Memo (p.6)

The Memo includes an archaeological Work Methods Statement (p.21) which advises that:
Proposed works at Marrickville, Belmore, Canterbury, and Lakemba have low risk and possibility to impact unexpected or poorly documented archaeological remains in archaeologically sensitive areas. As such, ground disturbance works at these stations should be archaeologically monitored.

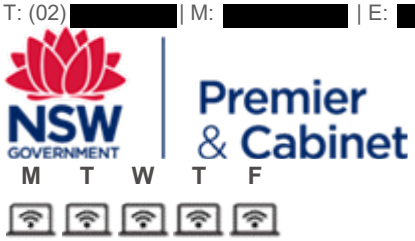
Review of the Memo provided by Artefact Heritage indicates it has completed adequate assessment and provides satisfactory recommendations for the proposed works, including an archaeological methodology and recommendations for 'make good' works.

I advise that Heritage NSW (on behalf of the Heritage Council of NSW) has **no objection to these works.**

Regards,

Siobhan

Dr Siobhán Lavelle OAM | **Senior Team Leader, Specialist Services**
Heritage NSW, Community Engagement, Department of Premier and Cabinet
Level 6, 10 Valentine Avenue, Parramatta Locked Bag 5020 Parramatta 2124
T: (02) [redacted] | M: [redacted] | E: [redacted]



Please lodge all Applications to Heritagemailbox@environment.nsw.gov.au Otherwise they will not be processed.

I acknowledge and respect the Traditional Custodians and Ancestors of the land I work across.

Heritage NSW and coronavirus (COVID-19)
Heritage NSW has taken steps to protect the safety, health and wellbeing of our staff, communities and customers. Whilst our offices remain open, we have put in place flexible working arrangements for our teams across NSW and continue to adapt our working arrangements as necessary. Face-to-face meetings and field work/site visits with our customers are subject to rules on gatherings and social distancing measures. We thank you for your patience and understanding at this time.

From: Jonathan Steele <Jonathan.Steele@mottmac.com>
Sent: Friday, 28 August 2020 3:23 PM
To: OEH HD Heritage Mailbox <HERITAGEMailbox@environment.nsw.gov.au>
Cc: Cath Snelgrove <Cath.Snelgrove@transport.nsw.gov.au>; Tim Solomon <Tim.Solomon@transport.nsw.gov.au>; Duncan Jones <duncan.jones@artefact.net.au>; Saunders, Matt <Matt.Saunders@arcadis.com>; Fethers, Ben <Ben.Fethers@arcadis.com>
Subject: Sydney Metro City and Southwest - Sydenham to Bankstown Trains to Metro Upgrade - low impact investigation works at multiple stations

To whom it may concern,

Metron T2M is proposing to undertake investigation works for the Southwest Metro Design Services Project, which is part of the Sydney Metro City and Southwest – Sydenham to Bankstown trains to metro upgrade; Infrastructure Approval SSI-8256. The proposed works are considered low impact activities under the instrument of approval. As some of the works are taking place within the heritage curtilage of State Heritage registered stations (Marrickville, Canterbury and Belmore), and works at Lakemba would take place in an area of predicted significant archaeological remains, Heritage NSW are being consulted for confirmation that these works can be considered low impact activities.

Please find a heritage impact assessment report attached which assess the impacts associated with the proposed works for Heritage NSW's review and approval.

We look forward to hearing from you in this regard. We respectfully request that we receive your reply by 18 September to allow us to achieve our site-mobilisation deadline.

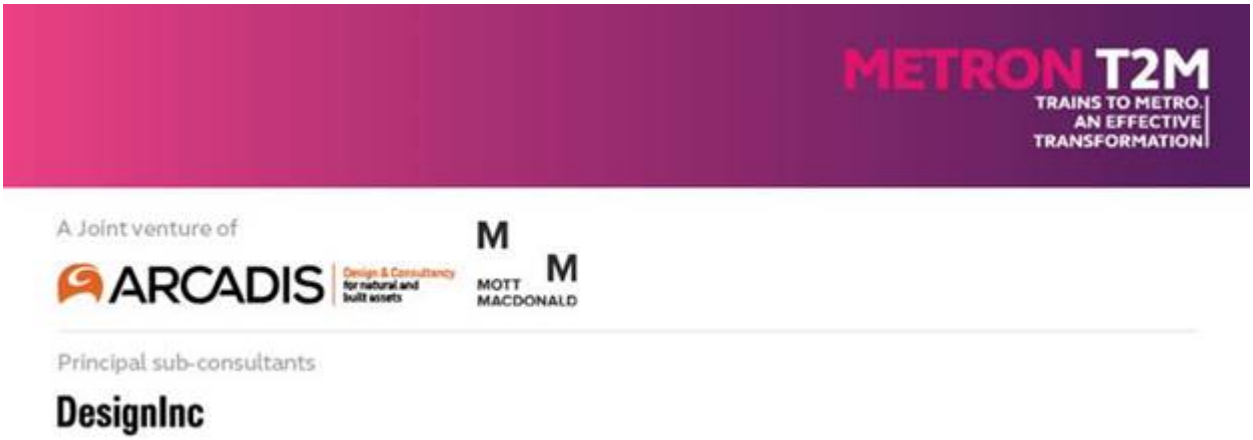
Please do not hesitate to contact me should you have any questions or if any item requires discussion.

Kind regards

Jonny

Jonny Steele
MSc BSc (Hons) MIEMA CEnv
Principal Environmental Consultant

D +[redacted] T +61 [redacted] M +61 [redacted]
F +[redacted]
[redacted]



Appendix 7: Consultation with DPIE

Planning, Industry & Environment

Fil Cerone
Director of Sustainability, Environment & Planning
City & Southwest
Sydney Metro

Level 43, 680 George Street
Sydney, NSW, 2000

07/10/2020

Dear Fil

Sydney Metro: Sydenham to Bankstown (SSI 8256)
Investigation excavation works inside Heritage Curtilages at Marrickville, Canterbury, Belmore and Lakemba Stations

I refer to your submission dated 23 September 2020 requesting the Planning Secretary's determination that proposed investigation excavation works at Marrickville, Canterbury, Belmore and Lakemba Stations, are not classed as 'construction' under the Definitions in Table 1 of the project approval and can proceed as low impact work, subject to the implementation of the mitigation measures detailed in the attached Heritage Impact Assessment (HIA) (dated 28 August 2020).

I note that investigation excavation works are proposed within the curtilage of items listed on the State Heritage Register (SHR) at Marrickville, Canterbury and Belmore Stations, and also within an area at Lakemba Station identified within the City and Southwest Sydenham to Bankstown Archaeological Assessment and Research Design Report (Artefact 2018) as being archaeologically sensitive.

As outlined in your letter and the HIA, I understand that the proposed works would result in nil to negligible impacts to heritage significant fabric and would not likely result in adverse impacts to heritage significant archaeological remains.

I also understand that several mitigation measures, outlined in the HIA and your Environmental Risk Assessment, will be developed and implemented to mitigate potential impacts in this area, including an Archaeology Method Statement.

I note that the HIA has been reviewed by Heritage NSW, who has advised that the assessment by Artefact Heritage is adequate and provides satisfactory recommendations for the proposed works. As such, Heritage NSW has advised that it has no objection to the proposed works.

As nominee of the Planning Secretary, I am satisfied that the proposed investigation excavation works are not classed as 'construction' under the Definitions in Table 1 of the project approval and can proceed as low impact works in accordance with the planning approval.

You must ensure that the management and mitigation measures identified in your Environmental Risk Assessment and HIA are implemented.

If you have any questions, please contact Jennie Yuan at jennie.yuan@planning.nsw.gov.au or 02 8289 6747.

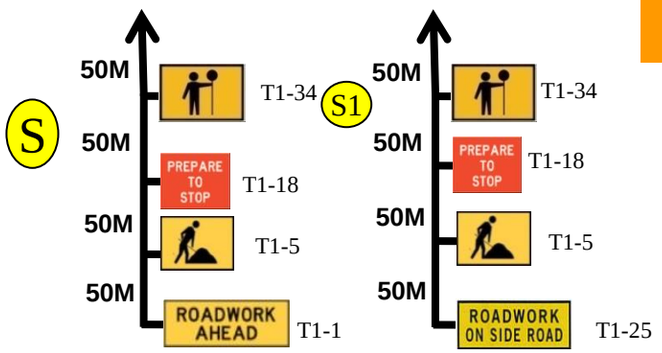
Yours sincerely

Jake Shackleton
A/Director
Infrastructure Management

As nominee of the Planning Secretary

Appendix 8: Traffic Control Plan

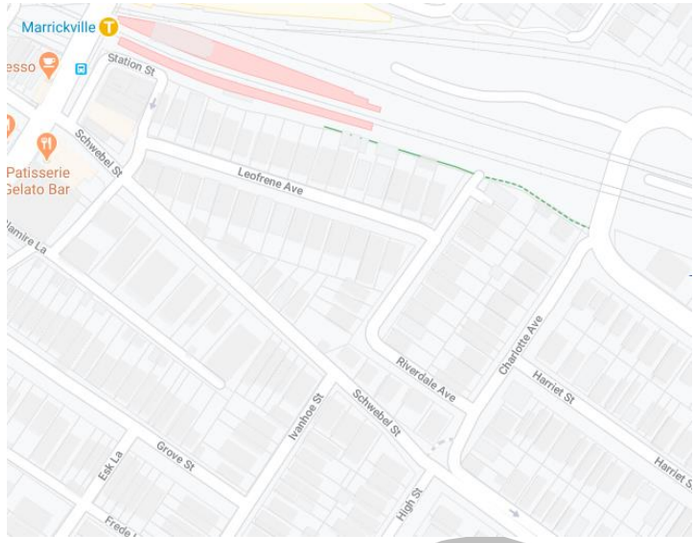
TCP/PMP – STATION ST AND RIVERDALE AVE MARRICKVILLE



Sign Size "Class A"

Traffic Controllers tasks include:
Minimising the risk by guiding people safely around the work place, maintaining the control measures by checking all barricades are in place & signs are visible, reviewing & revising control measures as per WHS Regulations 2011 Chapter 3 Part 3.1

WORKS TO BE UNDERTAKEN : SERVICE LOCATING



GENERAL NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH AS1742.3 & TCAWS 2010
2. ALL TRAFFIC CONTROL DIAGRAMS TO BE READ CONJUNCTION WITH THE TCAWS 2010.
3. NON- APPLICABLE EXISTING SIGNAGE SHALL BE COVERED E.G.. SPEEDS SIGNS DUE TO THE TEMPORARY SPEED ZONE.
4. ALL SIGNAGE DISTANCE SHALL COMPLY WITH AS 1742.3 & TCAWS 2010
5. IN ACCORDANCE WITH TCAWS 2010 TRAFFIC CONTROLLERS TO ASSIST PEDESTRIANS WITH MOVEMENT THROUGH & AROUND THE WORKSITE.
6. SIGNAGE SHALL BE PLACED ON THE SIDE OF THE ROAD ADJACENT TO THE TRAFFIC FLOW,
7. REMOVAL OF TRAFFIC CONTROL SIGNS AND DEVICES SHOULD BE UNDERTAKEN IN THE REVERSE ORDER OF ERECTION, PROGRESSING FROM THE WORK AREA OUT TOWARD THE APPROACHES.

RECOMMENDED TAPER LENGTH

APPROXIMATE SPEED OF TRAFFIC KM/H	TRAFFIC CONTROL AT BEGINNING OF TAPER	LATERAL SHIFT TAPER	MERGE TAPER
45 OR LESS	15	0	15
46 - 55	15	15	30
56 - 65	30	30	60
66 - 75	N/A	70	115
76 - 85	N/A	80	130
86 - 95	N/A	90	145
96 - 105	N/A	100	160
> 105	N/A	110	180

DIMENSON "D"

SPEED OF TRAFFIC KM/H	DIMINESON D=M AS.1742.3	DIMINESON D=M TCAWS
45 OR LESS	15m	15m
46 - 55	15m	50m
56 - 65	45m	60m
GREATER THAN 65 KM/H	EQUAL TO POSTED SPEED	

TOLERANCES

POSITIONING OF SIGNS
MINIMUM 10% LESS THAN THE DISTANCE OR LENGTHS GIVEN
MAXIMUM 25% MORE THAN THE DISTANCE OR LENGTHS GIVEN
SPACING OF DELINEATING DEVICES
MAXIMUM 10% MORE THAN THE SPACING GIVEN
NO MINIMUM

LANE WIDTHS

THE MIN LANE WIDTH TO BE PROVIDED THROUGH OR PAST THE WORKSITE SHALL BE 3.0m (3.5m DESIRABLE)

QUEUE MANAGEMENT PLAN

AT ALL TIMES DURING THE COURSE OF THE WORK TRAFFIC QUEUES SHALL BE MONITORED TO ENSURE THAT TRAFFIC DOES NOT EXCEED BEYOND THE LIMITS OF ADVANCED WARNING SIGNS

VEHICLE MOVEMENT PLAN

ALL WORK VEHICLES TO ENTER AND EXIT WORKSITE UNDER THE DIRECTION OF TRAFFIC CONTROLLER WITH THE TRAFFIC FLOW ON DESIGNATED UHF CHANNEL

All signage to be used in conjunction with this traffic control plan is to be in accordance with the Australian Standard AS/NZ 1742.3 of 2002 and the RTA Traffic Control at worksites Manual

1. Traffic Volume	*M*	*6. Ped. Diverted*	*Y*	*11. No of TC's on site*	*2*	**Road Type : COUNCIL**	**Road Km/Hr : 50**
2. Ped. Volume	*M*	*7. Path to Re-open*	*Y*	*12. Pedestrian Ramps*	*N*	**TMP Type : PED MANAGEMENT**	**Road Width: -**
3. Bollards & Danger Tape	*N*	*8. Parking Opposite work zone*	*Y*	*13. Bus Stop*	*N*	**Work Type : SERVICE LOCATING**	**Client : ASTREA**
4. Water Barriers	*N*	*9. Clearway*	*N*	*14. Bus Lane*	*N*	**Date : 02/10/2020**	**TCP No :102MOD**
5. TCP Overnight	*N*	*10. Duration. of work Days*		*15. RMS Approval*	*N*	**Prep by – ABDUL KRAYEM– 0051939014 – EXP 28/02/2022**	

SAF GROUP TRAFFIC CONTROL

(02) 95971381
Plan Not To Scale