15 April 2020

Attn: Erica van den Honert
Director – Infrastructure Management
NSW Department of Planning, Industry & Environment
Locked Bag 5022
Parramatta NSW 2124

Dear Erica,

Sydney Metro, SSI-8256, Request for determination from the Secretary – Low Impact Activities including utilities and sanitary pipe investigation works required inside State Heritage Curtilages and areas of archaeological potential at Marrickville, Canterbury, Belmore and Lakemba Stations.

Reference is made to Critical State Significant Infrastructure (SSI) Approval No. SSI 8256 which was approved by the Minister for Planning on 12 December 2018.

Sydney Metro proposes to undertake a number of investigation works, commencing 27 April 2020, to identify the locations of utility and sanitary pipe services to facilitate future works and inform design associated with the Sydenham to Bankstown Upgrade project.

The SSI 8256 approval instrument defines survey and investigation works as low impact, as part of the definition of "Construction". The definition of "Construction" also states the following:

However, where heritage items on the State heritage register, areas of known or expected archaeological potential, or threatened species or threatened ecological communities (within the meaning of the Biodiversity Conservation Act 2016) are affected by any low impact activity, that activity is construction, unless otherwise determined by the Planning Secretary, following consultation by the Proponent with OEH or DoI Fisheries (in the case of impact upon fish, aquatic invertebrates or marine vegetation).

The location of the proposed works are within the curtilage of Marrickville, Canterbury and Belmore Stations (which are State Heritage Register listed items) and in areas of archaeological potential at Marrickville, Canterbury, Belmore and Lakemba Stations (as determined in the Project's Archaeological Assessment and Research Design report). The approval therefore defines the work to be Construction, unless otherwise determined by the Planning Secretary, following consultation by the Proponent with NSW Heritage (formerly Office of Environment and Heritage).

Sydney Metro proposes to conduct site investigation works as "Low Impact Activities" subject to DPIE approval, within the curtilage of State Heritage Register listed items and/or areas of archaeological potential at Marrickville, Canterbury, Belmore and Lakemba

Stations.

Two Heritage Impact Assessments (HIA) were produced for the proposed scope of works and are both included in Appendix 1.

The utilities investigation HIA concluded that the proposed works would not likely result in adverse impacts to heritage significant fabric or archaeological remains, except at Canterbury station between Church Street and Hutton Street where the proposed potholing could potentially result in negligible impacts to archaeological remains of a c. 1842 structure associated with the Australasian Sugar Company Works (refer to page 20 of the document). Page 20 of the utilities investigation HIA identifies a number of mitigation measures to be implemented during the works, including the implementation of the Archaeological Method Statement (AMS) which is included on Page 18 of the HIA.

The sanitary pipe investigation HIA concluded that the proposed works would not likely result in adverse impacts to heritage significant fabric or archaeological remains (refer to page 14 of the document). Page 14 of the utilities investigation HIA identifies a number of mitigation measures to be implemented during the works, including the implementation of the Archaeological Method Statement (AMS) which is included on Page 13 of the HIA.

Further, the Aboriginal Cultural Heritage Assessment Report prepared for the project has not identified any areas of Aboriginal Heritage Significance in the vicinity of the proposed works.

The outline of the scope of works, methodology and corresponding mitigation measures are outlined in the attached HIA6 (Attachment 1).

The proposed scope of works has been reviewed by relevant Sydney Metro staff who have confirmed that the works will have minimal environmental impact.

Correspondence has been received from NSW Heritage on 2 April 2020 advising that the proposed mitigation measures were considered adequate and the proposed investigation works are considered acceptable. A copy of this correspondence is attached as Attachment 2.

An environmental risk assessment has been prepared to assess other potential environmental impacts associated with the proposed investigation activities. The environmental risk assessment will be reviewed by and endorsed by Sydney Metro as part of Sydney Metro's Pre-Construction Minor Works Approval process, and will be used for the management of environmental impacts during the works.

A copy of the environmental risk assessment is included as Attachment 3 for the Departments information.

Sydney Metro is therefore seeking determination from DPIE that the proposed investigation works as described are not classed as "Construction" and can proceed as "Low Impact Activities", subject to the implementation of the mitigation measures detailed in the attached HIAs (Appendix 1).

If you require any further information to assist your decision, please contact Ben Armstrong,

Senior Manager Environment on ben.armstrong2@transport.nsw.gov.au or 0404 831 197.

Yours sincerely,

Fil Cerone
Director of Sustainability, Environment & Planning
City & Southwest Metro
Transport for NSW

Attachment 1 – Heritage Impact Assessments for the proposed investigative activities

14 February 2020

Jonathan Steele
Senior Environmental Consultant
Mott MacDonald

Dear Mr Steele,

Re: Sydney Metro City and Southwest Design – Heritage impact assessment for utility service investigation

Project background

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. As part of the Revised Environmental Mitigation Measures (REMM) for the project, NAH12 indicates that mitigation measures outlined in the Non-Aboriginal archaeological assessments[1][2] for the project must be adhered to during design, investigation and construction works for the project.

As part of investigative works for the project, Metron T2M are proposing to conduct service location and assessments at a number of locations throughout the proposed project area. Potholing service investigation works at Marrickville, Lakemba and Canterbury Stations, as well as in the area between Church Street and Hutton Street in Canterbury, would be conducted in areas identified in SPIR assessments as archaeologically sensitive at these stations. Additional works would occur at Dulwich Hill Station but are not located in an archaeologically sensitive area. This memo provides an assessment of built heritage and archaeological impacts for the potholing and service location works and outlines management guidelines for conducting the works in these areas.

[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.
[2] Artefact 2018b. *Sydney Metro City & Southwest Sydenham to Bankstown Upgrade – Historical Archaeological Assessment & Research Design*. Report to Transport for NSW.

Proposed works

Mott MacDonald are proposing to undertake service location works through potholing service investigation works at Marrickville, Dulwich Hill, Canterbury, and Lakemba Stations, and between Church and Hutton Street in Canterbury.

Works would consist of non-destructive digging (NDD) excavation work, using high pressure water and vacuum suction (vacuum truck) excavation, as well as manual hand digging. Excavation works would be conducted to locate sanitary service pipes identified from Detailed Site Survey (DSS) plans for each station. Once sanitary pipes have been located during potholing excavation, some pipes may be opened to allow the insertion of drain cameras which would be extended into services to inspect their internal condition.

Previous assessments

This heritage assessment is based on historical and archaeological research provided in the previously prepared heritage reports for the Sydney Metro City and Southwest – Sydenham to Bankstown Project. The current assessment provides summaries of the historical and archaeological research prepared in these two reports but does not reproduce the historical context for these reports here. As such, this report should be read in conjunction with previously prepared heritage reports. Reports referenced in this assessment include:

- *Sydney Metro City & Southwest – Sydenham to Bankstown Non-Aboriginal Heritage Impact Assessment* (Artefact 2017)
- *Sydney Metro City & Southwest – Sydenham to Bankstown Historical Archaeological Assessment & Research Design* (Artefact 2018a)

This memo only assesses service location and assessment works that have been proposed to be conducted within the defined precinct boundaries of the Marrickville, Dulwich Hill, Canterbury and Lakemba Station sites for the Sydney Metro City and Southwest project.

Authorship

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

Built heritage impact assessment

Heritage listings

The proposed works would be undertaken with the curtilages of the following items listed on statutory heritage inventory registers:

Table 1: Heritage items

Item	Suburb	Significance	Listing
Marrickville Railway Station Group	Marrickville	State	• State Heritage Register (SHR 01186) • RailCorp s.170 heritage inventory register (SHI 4801091) • Marrickville LEP 2011 (I89)
Dulwich Hill Railway Station Group	Dulwich Hill	Local	• RailCorp s.170 heritage inventory register (SHI 4801909)
Canterbury Railway Station Group	Canterbury	State	• State Heritage Register (SHR 01109) • RailCorp s.170 heritage inventory register (SHI 4801100)
Lakemba Railway Station Group	Lakemba	Local	• RailCorp s.170 heritage inventory register (SHI 4801916) • Canterbury LEP 2012 (I143)

Direct (physical) impacts to heritage significant fabric

The proposed works would involve NDD and hand excavation at limited areas across the rail corridor and some station areas (potholing) to locate utility service pipes. Utility service pipes, once uncovered, would not be modified or impacted in any way.

The potholing locations at each station are located within platforms or within the rail corridor. No potholing works are anticipated to take place in areas which would require the removal or alteration of heritage significant fabric.

Table 2 summarises heritage significant fabric located in or near the area of works at each station and outlines any direct (physical) impacts to heritage significant fabric at each station.

Table 2: Summary of direct heritage impacts

Station and significance	Significant fabric near area of works	Discussion of direct (physical) heritage impacts	Summary of impact
Marrickville Station **State**	• Platform 2 (Exceptional) • Platform 2 Building (High) • Platform 2 Booking Office (Exceptional)	The proposed works at Marrickville Station are primarily located within the grassed area of the rail corridor and the pedestrian walkway directly adjacent to Platform 2. The proposed works would involve excavations in the grassed surface and the removal of the concrete/asphalt surface of the footpath for the assessment, recording and measurement of suspected pipes. However, although the works are located directly adjacent to Platform 2 (fabric of exceptional significance) and the Platform 2 Building (fabric of high significance), the rail corridor and walkway are not part of these elements and are not considered to be significant fabric. The works would not impact on any original brick coping or the surface of the platform itself, and the pipes are located behind the Platform 2 Building and the investigation would stop before the Platform 2 Booking Office. Overall, it is not expected that the proposed works would impact significant fabric associated with the heritage item.	Neutral
Dulwich Hill Station **Local**	• Overbridge (Moderate)	The Overbridge was identified as being fabric of moderate significance. The proposed potholing works would involve the removal of the concrete surface of the pedestrian footpath on the Overbridge in two locations for the assessment, recording, and measurement of an Ausgrid Electrical cable along the eastern side of the bridge. While the Overbridge is considered moderately significant fabric, this significant element is associated with the brick abutments and concrete deck; existing wearing surfaces and any subsurface fill materials are not heritage significant fabric and the works would not physically impact the heritage significance of this element.	Negligible
Canterbury Station **State**	• Overbridge (High)	The c.1917 Overbridge was identified as being fabric of high significance. The proposed potholing works would involve the removal of the asphalt surface of the Overbridge in two locations for the assessment, recording, and measurement of an Ausgrid Electrical cable along the southern pedestrian footpath of the bridge. While the Overbridge is considered high significance fabric, asphalt surfaces and subsurface road fill materials are not heritage significant fabric and the works would not physically impact the heritage significance of this element. It is not expected that the proposed works would impact any original brick or concrete decking, girders, or the parapet walls.	Negligible

Lakemba Station **Local**	•	Not applicable	The proposed works are located along the embankment to the south of the rail corridor. The embankment is not part of the listed heritage curtilage and as a result the proposed works would primarily be located outside of the heritage curtilage of Lakemba Station. Furthermore, the rail corridor is not considered to significant fabric and the proposed works would not extend to Platform 1. As a result, it is not expected that the works would impact any significant fabric associated with the heritage item.	Neutral

Indirect (visual) impacts to heritage significance

It is expected that the proposed works would replace the removed asphalt, concrete, and grassed surfaces at all stations to their pre-existing condition following the completion of works. So long as reinstated surfaces are made good to match existing surfaces, the proposed works would not result in any adverse indirect (visual) heritage impacts at any station.

Archaeological impact assessment

Scope of assessment

The Archaeological Assessment and Research Design report (ARD) prepared for the Submissions and Preferred Infrastructure Report (SPIR) for the project provided a detailed archaeological assessment for the Metro South West line. This report identified significant archaeological remains at Canterbury, Belmore, Marrickville and Lakemba Stations, as well as near the rail corridor footbridge between Church Street and Hutton Street in the wider Canterbury Station precinct. The following archaeological impact assessment is provided only for these stations and areas. Utility investigations being undertaken at other locations have not been assessed for archaeological impacts as no remains have been predicted at these other locations.

The full historical background and land use phases for each railway station can be found within the SPIR ARD report. Information provided here has been derived from this report.

Marrickville Station

Potential archaeological remains at Marrickville Station

The ARD has previously predicted archaeological remains of local significance to be present at Marrickville Station. A summary of the relevant archaeological potential and significance of predicted remains is provided in Table 3, and the location and of these archaeological resources for significant phases is provided in Figure 1.

The ARD identified the area of the proposed potholing works as having moderate to high potential to contain archaeological remains of local significance. In particular the location of the proposed potholing is situated in the former location of the coal loading and storing facilities within the rail corridor. It was assessed that there was low potential for archaeological remains associated with these to be present, and it was assessed that the archaeological remains were unlikely to reach the threshold of local significance. The proposed potholing is also located adjacent to Platform 2 which could contain evidence such as earlier platform alignments or footings. It was assessed that there was moderate to high potential for archaeological remains associated with earlier platform infrastructure to be present, and these remains would likely reach the threshold of local significance. However, the proposed potholing works are situated within the rail corridor and walkway adjacent to

Platform 2 and do not extend into the platform. Therefore, as the proposed works do not extend into the platform it is not expected that evidence of earlier platform infrastructure would be present within the area of proposed works.

Table 3: Summary of areas with potential for significant archaeological remains for Marrickville Station[3]

Phase	Archaeological Resource	Potential	Significance
1 (1788-1850s)	• Archaeological features associated with land clearance such as tree boles, evidence of dairy farming and market gardening including fence line postholes, former shed postholes, brick or paved yard surfaces, field drains, isolated artefact scatters.	Nil to Low	Unlikely to reach threshold for Local significance
2 (1850s – 1890s)	• Archaeological features associated with farming such as fence or shed postholes, field drains and isolated artefacts, drains or culverts associated with the former creek.	Nil to Low	Unlikely to reach threshold for Local significance
3 (1890s – 1920s)	• Archaeological remains associated with the early phase of railway infrastructure such as culverts, ceramic service pits, utilities such as woodstave sewer or ceramic pipes; brick drainage pits, electrical conduits and pits, stanchion bases, sleepers and rail track. • Identified remains of original stone copings, earlier alignment of platforms, footscrapers, buried services, original lever set, footings of former platform stairs, platform brick dwarf walls, and building footings. • Moderate potential for footings of former platform canopies. • Low potential for former level crossing at the current Illawarra Road overbridge. • Archaeological remains of the former Earlwood tram line that ran across Illawarra Road overbridge such as tram tracks and associated infrastructure.	Moderate to High	Local
	• Low potential for footings of former coal loading and storage facilities. • Low potential for archaeological remains of the former sleeper bridge such as bridge footings.	Low	Unlikely to reach threshold for Local significance
4 (1930s – Present)	• Archaeological remains associated with upgrades such as utilities and drainage. • Footings associated with the commuter car parking structure and the Illawarra Road footbridge. • Footings of signalling huts and boxes.	Moderate to High	Unlikely to reach threshold for Local significance

[3] Artefact 2018a: Table 3-4.

Archaeological management strategy for works at Marrickville Station

The ARD has assessed potential impacts to archaeological resources at Marrickville Station from the main works required for renovations to Marrickville Station for the Sydney Metro City & Southwest Project. The archaeological management policies for these works are outlined in Table 4 and the location of the archaeological management zones are illustrated in Figure 2.

Table 4: Summary of archaeological management requirements at Marrickville Station Catchment[4]

Phase	Potential Archaeology	Management Zone	Mitigation
1 (1788-1850s)	Nil to low potential for archaeological features associated with land clearance such as tree boles, evidence of dairy farming and market gardening including fence line postholes, former shed postholes, brick or paved yard surfaces, field drains, isolated artefact scatters. Unlikely to reach the threshold for local significance.	3	Unexpected Finds Procedure
2 (1850s – 1890s)	Nil to low potential for archaeological features associated with farming such as fence or shed postholes, field drains and isolated artefacts, drains or culverts associated with the former creek. Unlikely to reach the threshold for local significance.	3	Unexpected Finds Procedure
3 (1890s – 1920s)	Moderate to high potential for potentially local significant archaeological remains associated with the early phase of railway infrastructure such as culverts, ceramic service pits, brick drainage pits, electrical conduits and pits, stanchion bases, sleepers and rail track. Identified remains of original stone copings, earlier alignment of platforms, footscrapers, buried services, original lever set, footings of former platform stairs, platform brick dwarf walls, and building footings. Moderate potential for footings of former platform canopies Low potential for former level crossing at the current Illawarra Road overbridge. Moderate potential for archaeological remains of the former Earlwood tram line that ran across Illawarra Road overbridge such as tram tracks and associated infrastructure	1	• AMS • Salvage Excavation
	Low potential for footings of former coal loading and storage facilities. Low potential for archaeological remains of the former sleeper bridge such as bridge footings.	3	Unexpected Finds Procedure

[4] Artefact 2018a: Table 3-5.

Phase	Potential Archaeology	Management Zone	Mitigation
4 (1930s – Present)	Moderate to high potential for archaeological remains associated with upgrades such as utilities and drainage, footings of signalling huts and boxes, and footings associated with the commuter car parking structure and the Illawarra Road footbridge. Unlikely to reach the threshold for local significance.	3	Unexpected Finds Procedure

Figure 1. Areas of archaeological potential at Marrickville Station, location of potholing shown as a red dashed line / red arrow

Figure 2: Marrickville Station Catchment archaeological management zones, location of potholing shown as a blue dashed line / blue arrow

Marrickville Station archaeological impact assessment

The proposed potholing works are located on the southern edge of the rail corridor at Marrickville Station, and would be conducted to identify the location and integrity of an existing sewer line in this location. Potholing in this area would be conducted at approximately every 20 metres over a length of ground approximately 160 metres in extent.

Significant archaeological remains in this potholing area are largely associated with physical remains of former infrastructure, identified in the 1918 railway plan for Marrickville Station. It is possible that services that are being sought may be remnant utility services identified on early historical plans and may themselves be of significance.

The proposed potholing would not involve penetrating into services at any point and is being conducted to confirm locations previously identified on Detailed Site Survey (DSS) plans. As such, the works would likely result in negligible impacts to significant archaeological remains.

It is illustrated in Figure 2 that the location of the proposed works is mapped within Management Zone (MZ) 1 and MZ 2. Further archaeological management of these works would be required.

Canterbury Station

Potential archaeological remains at Canterbury Station

The ARD has previously predicted archaeological remains of State and local significance to be present at Canterbury Station. A summary of the relevant archaeological potential and significance of predicted remains is provided in Table 5, and the location and of these archaeological resources for significant phases is provided in Figure 3.

The proposed potholing works at Canterbury Station would be restricted to the Canterbury Road overbridge. The ARD report identified the area of the overbridge as having nil to low potential to contain archaeological remains and no specific archaeological features were identified in the proposed location of the potholes. The area of archaeological potential associated with the 1843 plan is situated below the overbridge and does not extend to the overbridge itself (Figure 3). As a result, it is not expected that significant archaeological remains would be located in the location of the proposed works.

Table 5: Summary of areas with potential for significant archaeological remains for Canterbury Station[5]

Phase	Archaeological Resource	Potential	Significance
1 (1788-1841)	• Archaeological features associated with land clearance such as tree boles, evidence of estate farming activities such as fence line postholes, former shed postholes, field drains, isolated artefact scatters.	Nil to Low	Unlikely to reach threshold for Local significance
2 (1841 – 1855)	• Archaeological remains of outbuildings, landscape modifications, fence lines, drains and other structural remains associated with the Australasian Sugar Company works. • Archaeological remains of the outbuildings such as footings, timber slabs remnants, underfloor	Moderate to High	Potentially State

[5] Artefact 2018a: Table 4-3.

Phase	Archaeological Resource	Potential	Significance
	deposits, post holes, artefact deposits, cess pits, wells, cisterns, fencelines, and yard surfaces. • Evidence of small scale mining activities. • Archaeological evidence of farming includes fence line postholes, former shed postholes, brick or paved yard surfaces, field drains, isolated artefact scatters. • Archaeological remains of early residential cottages including wells, cisterns and refuse pits.		
3 (1855 – 1895)	• Archaeological remains of early residential cottages including wells, cisterns and refuse pits. • Archaeological remains of outbuildings, landscape modifications, fence lines, drains and other structural remains associated with the Blackett and Co Canterbury Engineering Works.	Moderate to High	Potentially Local
4 (1895 – 1943)	• Archaeological remains and evidence of early railway construction including rails, refuse pits, drains and timber sleepers. • Archaeological remains of former platform structures. • Archaeological remains of the former race platform and retaining wall. • Archaeological remains of the storage sidings for the Canterbury Racecourse special trains and the shunting of the local goods sidings. • Archaeological remains of early infrastructure such as culverts, tanks, drains (brick, stone or concrete), electrical conduits and pits, sleepers, signalling equipment and rail track. • Archaeological remains associated with the early phase of minor railway buildings (such as toilets) prior to track realignment such as postholes, brick footings, former floor surfaces, and early infrastructure such as ceramic service pipes, brick drainage pits, electrical conduits and pits, stanchion bases, sleepers and rail track. • It is unlikely that artefact-bearing deposits associated with the early station accumulated or survived subsequent development and upgrades.	Moderate	Potentially Local
5 (1943 – Present)	• Archaeological remains associated with upgrades such as utilities and drainage.	Moderate to High	Unlikely to reach threshold for Local significance

Archaeological management strategy for works at Canterbury Station

The ARD has assessed potential impacts to archaeological resources at Canterbury Station from the main works required for renovations to Canterbury Station for the Sydney Metro City & Southwest Project. The archaeological management policies for these works are outlined in Table 6 and the location of the archaeological management zones are illustrated in Figure 4.

Table 6: Summary of archaeological management requirements at Canterbury Station Catchment[6]

Phase	Potential Archaeology	Management Zone	Mitigation
1 (1788-1841)	Nil to low potential for archaeological features associated with land clearance such as tree boles, evidence of estate farming activities such as fence line postholes, former shed postholes, field drains, isolated artefact scatters. Unlikely to reach the threshold for local significance.	3	Unexpected Finds Procedure
2 (1841 – 1855s)	Moderate to high potential for potentially State significant archaeological remains of outbuildings, landscape modifications, fence lines, drains and other structural remains associated with the Australasian Sugar Company works. Archaeological remains of the outbuildings such as footings, timber slabs remnants, underfloor deposits, post holes, artefact deposits, cess pits, wells, cisterns, fencelines, and yard surfaces. Evidence of small scale mining activities, archaeological evidence of farming includes fence line postholes, former shed postholes, brick or paved yard surfaces, field drains, isolated artefact scatters. Archaeological remains of early residential cottages including wells, cisterns and refuse pits.	1	• AMS • Salvage Excavation
3 (1855 – 1895)	Moderate to high potential for potentially locally significant archaeological remains of early residential cottages including wells, cisterns and refuse pits. Archaeological remains of outbuildings, landscape modifications, fence lines, drains and other structural remains associated with the Blackett and Co Canterbury Engineering Works.	1	• AMS • Salvage Excavation
4 (1895 – 1943)	Moderate potential for locally significant archaeological remains and evidence of early railway construction including rails, refuse pits, drains and timber sleepers. Archaeological remains of former platform structures. Archaeological remains of the former race platform and retaining wall. Archaeological remains of the storage sidings for the Canterbury Racecourse special trains and the shunting of the local goods sidings. Archaeological remains of early infrastructure such as culverts, tanks, drains (brick, stone or concrete), electrical conduits and pits, sleepers, signalling equipment and rail track.	1	• AMS • Salvage Excavation

[6] Artefact 2018a: Table 4-4.

Phase	Potential Archaeology	Management Zone	Mitigation
	Archaeological remains associated with the early phase of minor railway buildings (such as toilets) prior to track realignment such as postholes, brick footings, former floor surfaces, and early infrastructure such as ceramic service pipes, brick drainage pits, electrical conduits and pits, stanchion bases, sleepers and rail track. It is unlikely that artefact-bearing deposits associated with the early station accumulated or survived subsequent development and upgrades.		
5 (1943 – Present)	Moderate to high potential for archaeological remains associated with upgrades such as utilities and drainage. Unlikely to reach the threshold for local significance.	3	Unexpected Finds Procedure

Figure 3. Archaeological Potential at Canterbury Station, location of potholing shown as red circles / red arrows. The location of the potholing between Church Street and Dutton Street (assessed separately below) is shown as a yellow line / yellow arrow

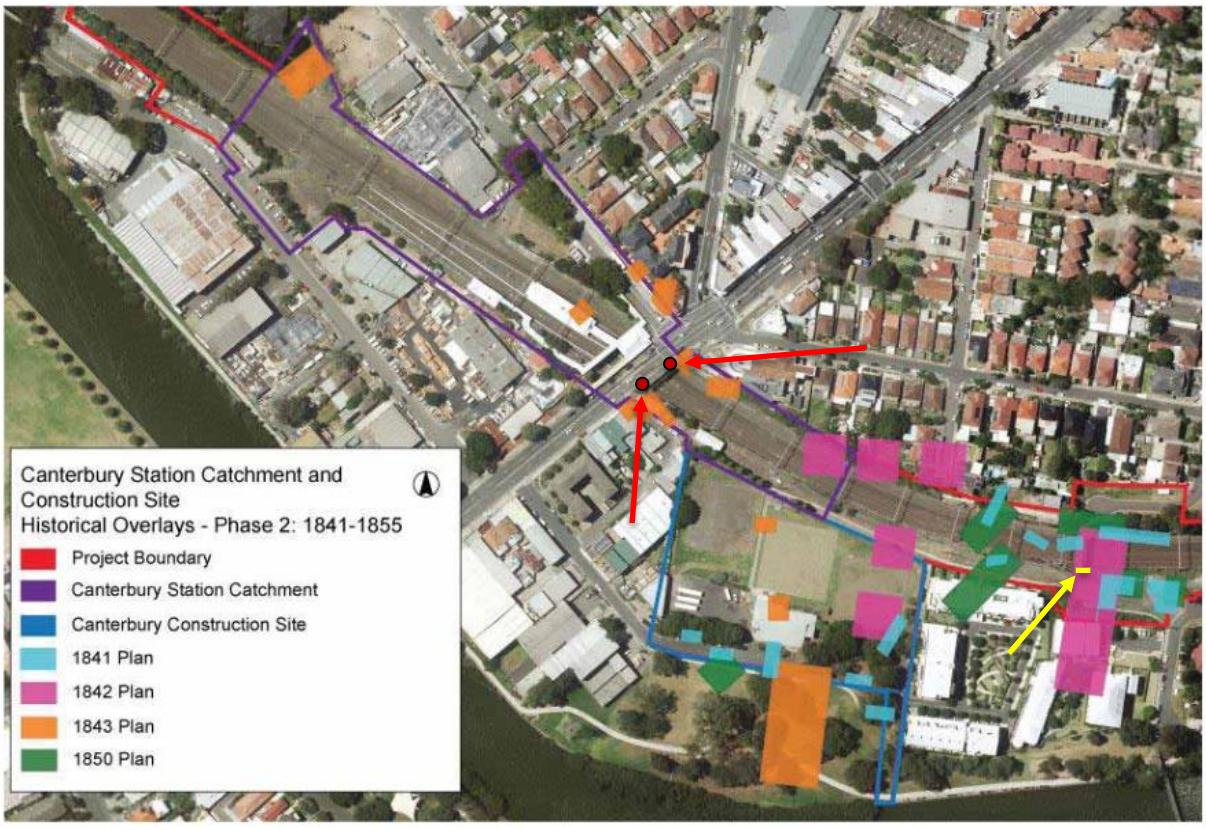
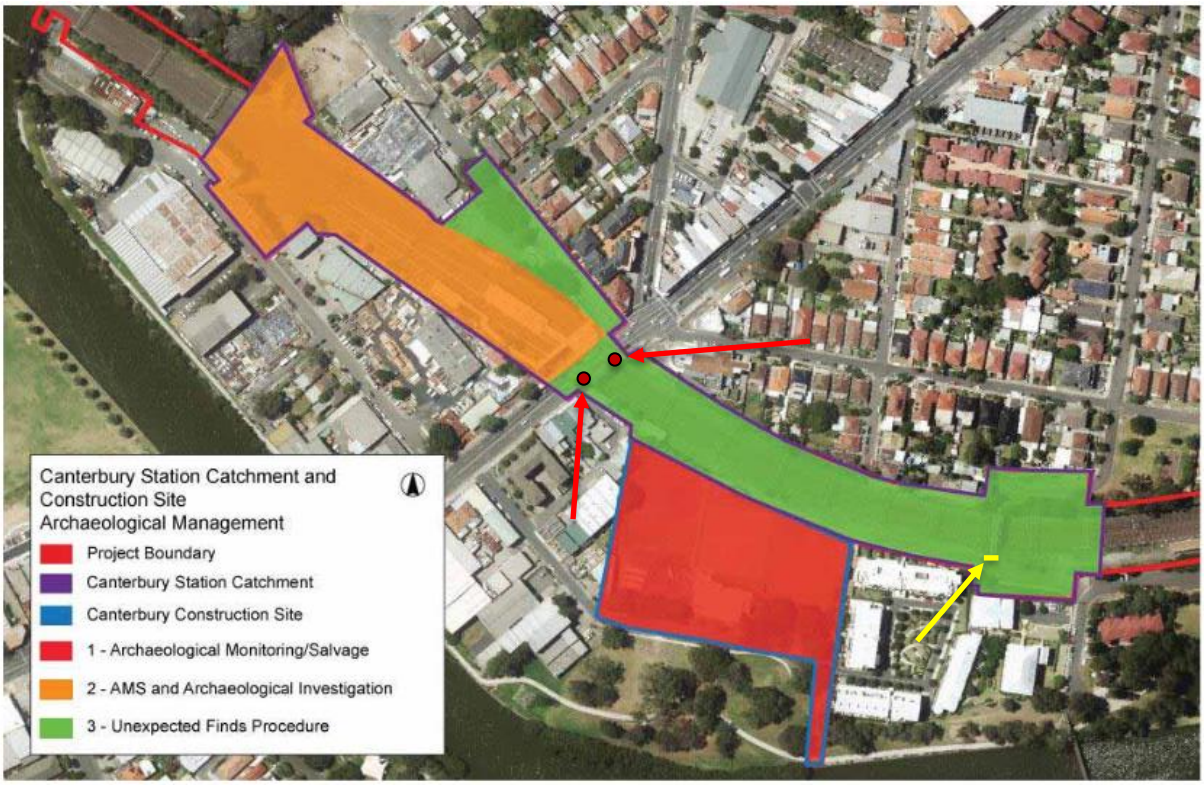


Figure 4: Canterbury Station Catchment archaeological management zones, location of potholing shown as red circles / red arrows. The location of the potholing between Church Street and Dutton Street (assessed separately below) is shown as a yellow line / yellow arrow



Canterbury Station archaeological impact assessment

The proposed potholing would be limited to the Canterbury Road overbridge. This area has been assessed as having nil to low potential to contain archaeological remains associated with pre-rail structures and occupation. However, the investigation locations are situated on the current Canterbury Road overbridge over the rail corridor, in an area where all archaeological remains would have been removed during the construction of the railway line in the 1890s.

As the investigation locations would be situated within the footpath of the current Canterbury Road overbridge, they would be located in modern fabric elevated several metres above the disturbed ground of the active rail corridor. As such, the archaeological zone mapping provided in Figure 4 above provides the archaeological potential for remains located *underground*.

The potholing works on the Canterbury Road bridge therefore would result in neutral impacts to significant remains. Per the ARD the location of the proposed works is within MZ 3 (Figure 4).

Canterbury Station Precinct between Church Street and Hutton Street

Potential archaeological remains at Canterbury Station Precinct between Church and Hutton Streets

The ARD has previously predicted archaeological remains of State and local significance to be present at Canterbury Station. A summary of the relevant archaeological potential and significance of predicted remains is provided in Table 5, and the location and of these archaeological resources for significant phases is provided in Figure 4.

The proposed potholing works at Canterbury Station between Church Street and Hutton Street are situated within the former footprint of a c.1842 structure associated with the Australasian Sugar

Company works (Phase 2). The ARD identified that there was moderate to high potential for archaeological remains associated with Phase 2, including evidence of former structures, outbuildings, footings, postholes, deeper subsurface features (cesspits or wells), and artefact deposits, to be present in some locations at Canterbury Station. The ARD also identified that archaeological remains associated with Phase 2 could potentially reach the threshold of State significance. However, due to the expected disturbances associated with the construction of the railway corridor, it was assessed that the potential for intact remains associated with Phase 2 to be present near the rail corridor at Canterbury Station, including the location of the proposed potholing between Church Street and Hutton Street, was low.

However, as the proposed potholing is located on top of the embankment adjacent to the rail corridor rather than within the rail corridor itself, there may be slightly higher potential for significant archaeological remains to have survived in that location.

Archaeological management strategy for works at Canterbury Station between Church and Hutton Streets

The ARD has assessed potential impacts to archaeological resources at Canterbury Station from the main works required for renovations to Canterbury Station for the Sydney Metro City & Southwest Project. The archaeological management policies for these works are outlined in Table 6 and the location of the archaeological management zones are illustrated in Figure 4.

Canterbury Station, between Church and Hutton Streets, archaeological impact assessment

The proposed potholing between Church Street and Hutton Street is situated within the former footprint of a c.1842 structure associated with the Australasian Sugar Company works (Phase 2), and intact archaeological remains associated with this former structure could potentially reach the threshold of State significance. However, the proposed potholing is located in the area of lower archaeological potential due to the expected impacts associated with the construction of the rail corridor. Furthermore, the potholing works would be located in areas where existing Ausgrid Electrical cables are suspected to be located, and as such, archaeological deposits or features are more likely to have been disturbed and/or removed in these localised areas. In addition, the ground disturbance caused by the potholing works would be limited in size and the use of a vacuum truck and manual excavation would further reduce the risk of archaeological impacts to archaeological remains even if they were predicted to be located within this area.

Overall, there is generally low potential that the proposed works between Church Street and Hutton Street is likely to result in negligible impacts to significant archaeological resources at the Canterbury Station precinct.

Per the ARD the location of the proposed works is within MZ 3 (Figure 4).

Lakemba Station

Potential archaeological remains at Lakemba Station

The ARD has previously predicted archaeological remains of local significance to be present at Lakemba Railway Station. A summary of the relevant archaeological potential and significance of predicted remains is provided in Table 7, and the location and of these archaeological resources for significant phases is provided in Figure 5.

The ARD identified the area of the proposed potholing works as having low to moderate potential to contain archaeological remains of local significance. In particular the proposed potholing is situated in the vicinity of Platform 1, which could contain evidence of the first timber island platform and initial railway infrastructure such as timber footings and postholes, brick drainage pits, sleepers and rail track. However, the proposed potholing works would be limited to the embankment on the other side of the rail corridor from the platform and would not extend into the rail corridor or the platform

structure. The ARD did not identify any specific archaeological features within the embankment. Therefore, as the proposed works do not extend into the platform or rail corridor it is not expected that evidence of earlier platform or rail infrastructure would be present within the area of proposed works.

Table 7: Summary of areas with potential for significant archaeological remains for Lakemba Station[7]

Phase	Archaeological Resource	Potential	Significance
1 (1788-1880s)	• Initial land owners associated with moderately sized grants used for agricultural and pastoral purposes. • Archaeological features associated with low intensity land use such as timber getting, grazing and farming include tree boles, fence line postholes, field drains and isolated artefact scatters.	Nil to Low	Unlikely to reach threshold for Local significance
2 (1880 – 1909)	• Establishment of the Taylor House (Lakemba), stables and potential outbuildings. • Archaeological features associated with farming activities, domestic and agricultural structures, refuse pits and drains or culverts.	Low	Potentially Local
3 (1909 – 1919)	• Archaeological remains associated with the first timber island platform and initial railway infrastructure such as brick drainage pits, electrical conduits and pits, stanchion bases, timber footings and postholes, sleepers and rail track.	Low to Moderate	Potentially Local
4 (1919 – Present)	• Archaeological remains associated with station and rail corridor upgrades such as utilities and drainage.	Moderate	Unlikely to reach threshold for Local significance

Archaeological management strategy for works at Lakemba Station

The ARD has assessed potential impacts to archaeological resources at Lakemba Station from the main works required for renovations to Lakemba Station for the Sydney Metro City & Southwest Project. The archaeological management policies for these works are outlined in Table 8 and the location of the archaeological management zones are illustrated in Figure 6.

[7] Artefact 2018a: Table 6-3.

Table 8: Summary of archaeological management requirements at Lakemba Station Catchment[8]

Phase	Potential Archaeology	Management Zone	Mitigation
1 (1788-1880s)	Nil to low potential for archaeological remains associated with the initial land owners associated with moderately sized grants used for agricultural and pastoral purposes. Archaeological features associated with low intensity land use such as timber getting, grazing and farming include tree boles, fence line postholes, field drains and isolated artefact scatters. Unlikely to reach the threshold for local significance.	3	Unexpected Finds Procedure
2 (1880 – 1909)	Low potential for locally significant archaeological remains associated with the establishment of the Taylor House (Lakemba), stables and potential outbuildings. Archaeological features associated with farming activities, domestic and agricultural structures, refuse pits and drains or culverts.	3	• Unexpected Finds Procedure
3 (1909 – 1919)	Low to moderate potential for locally significant archaeological remains associated with the first timber island platform and initial railway infrastructure such as brick drainage pits, electrical conduits and pits, stanchion bases, timber footings and postholes, sleepers and rail track.	1	• AMS • Salvage Excavation
4 (1919 – Present)	Moderate potential for archaeological remains associated with station and rail corridor upgrades such as utilities and drainage. Unlikely to reach the threshold for local significance.	3	Unexpected Finds Procedure

Lakemba Station archaeological impact assessment

The proposed potholing would be limited to the embankment to the south of the rail corridor. This area is located on the opposite side of the rail corridor as the platform, which is the main area of archaeological potential, and no specific archaeological features were identified within the embankment. Furthermore, the potholing works would be located in areas where existing utility pipes are suspected to be located, and as such, archaeological deposits or features are more likely to have been disturbed and/or removed in these localised areas. In addition, the ground disturbance caused by the potholing works would be limited in size and the use of a vacuum truck and manual excavation would further reduce the risk of archaeological impacts to archaeological remains even if they were predicted to be located within this area.

Overall, it is expected that the proposed works would result in neutral impacts to significant archaeological resources at the Lakemba Station precinct.

It is illustrated in Figure 6 that the location of the proposed works is mapped within MZ 1, which requires further archaeological management. However, due to the specific degree of previous ground disturbance in this location, particularly with the presence of existing utility services, impacts to archaeological remains is not expected. However, due to the low potential for significant remains to be located in this area, further archaeological management is required.

[8] Artefact 2018a: Table 6-4.

Figure 5. Archaeological potential at Lakemba Station (pothole locations in red)

Figure 6: Lakemba Station Catchment archaeological management zones, location of potholing shown as red dashed lines / red arrows

Archaeological management and mitigation measures

While the proposed potholing works at Marrickville, Canterbury, and Lakemba Stations would be conducted in areas which have been designed as requiring the preparation of Archaeological Method Statement (AMS) reports, the predicted archaeological impacts associated with most of the proposed locations have been assessed as neutral to negligible. In accordance with the archaeological management methodology outlined in the Archaeological Research Design (ARD) for the project:

"An AMS would be prepared prior to construction works with the potential to impact archaeological resources".[9]

As the proposed potholing works have been assessed to not cause any impacts to significant archaeological resources identified in archaeological assessments previously prepared for the project, an AMS is not required to be prepared prior to the works taking place at Canterbury Station.

Works at Marrickville Station, Lakemba Station and in the Canterbury Station precinct between Church Street and Hutton Street, while they would not likely impact archaeological remains, would be taking place within an area of predicted archaeological sensitivity. While the degree of impact is considered negligible at most, as service location works would be taking place in areas where services are suspected of being located, the predicted archaeological sensitivity must be managed with an AMS in accordance with the environmental approvals for the project. As such, an AMS has been prepared for these works to take place in the section below.

Archaeological Method Statement

Archaeological monitoring

Due to the low level of risk that the proposed potholing at Marrickville and Lakemba Stations, as well as at the Canterbury Station precinct between Church Street and Hutton Street, have the low possibility of harming archaeological remains in archaeologically sensitive areas.

As such, ground disturbing works at Marrickville Station, Lakemba Station and within the Canterbury Station precinct between Church Street and Hutton Street should be archaeologically monitored.

Archaeological monitoring involves the nominated archaeologist/s being present during ground disturbance works which may impact on locally significant archaeological remains. If archaeological remains are encountered, works in the immediate area would cease until the archaeologist/s has adequately investigated and recorded the remains. Truncated and disturbed remains, which are not significant or do not have research potential, such as former rail infrastructure would be recorded.

As all potholing works would involve non-destructive (vacuum truck) excavation, and predicted remains are expected to be structural and not artefactual in nature, impacts to structural remains would not occur. No significant structural remains would be removed as part of the proposed works. Should structural remains be located within an excavation area at a level above where service identification works seek to excavate to, the potholing location would be horizontally moved to avoid significant structural remains, under the supervision of the monitoring archaeologist.

All subsurface remains would be archaeologically recorded. Archaeological recording would involve photographing the proposed works and writing a monitoring diary detailing the occurring works and any archaeological finds. Any archaeological remains would be photographed *in situ* and significant remains would be illustrated in plan form by the archaeologist.

[9] Artefact 2018b, p. 128.

In the event that significant and intact remains not identified in the ARD or this archaeological assessment are encountered during works, all excavation works would cease, the remains protected, further assessment undertaken, and DPC Heritage would be notified. If significant archaeological remains are identified which would be impacted by further potholing works, the potholing works may no longer be classified as low impact activities and further assessment and archaeological investigation would be required.

Should potential State significant archaeological remains, related to the former Canterbury sugar mill, be identified during potholing works between Church Street and Hutton Street, ground disturbing works must cease in this location. In the eventuality that ground disturbing works have identified State significant archaeological remains, works should not recommence in this area. Further archaeological assessment, investigation and approval would be required.

Archaeologists would not be required to monitor backfilling, reinstatement of asphalt and other ground surfaces, or any drain camera investigation works which do not involve any ground excavation.

Approval pathway

Low impact activities

The instrument of approval for the project was approved on 12 December 2018, and provides the following description of low impact activities in that document:[10]

> *(b) investigations including investigative drilling and excavation;*
>
> *(i) archaeological testing under the Code of practice for archaeological investigation of Aboriginal objects in NSW (DECCW, 2010) or archaeological monitoring undertaken in association with (a)-(h) above to ensure that there is no impact on heritage items*

The instrument of approval also states that:

> *However, where heritage items on the State heritage register, areas of known or expected archaeological potential, … are affected by any low impact activity, that activity is construction, unless otherwise determined by the Planning Secretary, following consultation by the Proponent with OEH (*Office of Environment and Heritage – now Department of Premier and Cabinet [DPC] Heritage*)….*

The potholing works are being conducted for service investigation for utility services. The proposed works would result in neutral adverse impacts to heritage significant fabric and neutral to negligible impacts to significant archaeological resources. As such, these works would be considered Low Impact environmental activities, and can be progressed in advance of the preparation of the overall Construction Environmental Management Plan (CEMP) for the project works.

As such, consultation should be conducted with DPC Heritage for the potholing works at the following State heritage registered stations, where works are also taking place within areas of identified non-Aboriginal archaeological potential:

[10] NSW Planning and Environment, 12 December 2018. *Infrastructure Approval for SSI 8256*. Accessed online at http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8256.

- Marrickville Station
- Canterbury Station.

DPC Heritage should also be consulted for potholing works at the Lakemba Station, as potholing works would take place within an area mapped in the ARD as MZ 1 and MZ 2.

Conclusions and recommendations

The proposed works would involve NDD potholing within the curtilages of eight heritage listed railway stations on the T3 Bankstown Line. These works would not result in adverse impacts to heritage significant fabric.

The proposed works would involve NDD potholing within four areas where the potential for State and locally significant archaeological remains have been identified. The proposed works would not likely result in adverse impacts to heritage significant archaeological remains, except at Canterbury Station between Church Street and Hutton Street where the proposed potholing could potentially result in negligible impacts to archaeological remains of a c. 1842 structure associated with the Australasian Sugar Company works (Phase 2). Stations where potholing works would be conducted within archaeologically sensitive areas are:

- Marrickville Station
- Canterbury Station (including between Church Street and Hutton Street)
- Lakemba Station.

These works would be classified as low impact environmental activities under the instrument of approval for the project. As works at Marrickville and Canterbury Stations are taking place within the curtilage of heritage items listed on the State Heritage Register, and works at Lakemba Station would take place in an area mapped in the ARD as MZ 1, DPC Heritage should be consulted to confirm that these works would be considered low impact environmental activities.

Following confirmation that the works are approved as low impact activities, the following recommendations must be followed during the potholing works to help minimise the risk of inadvertent impacts to significant fabric or archaeological remains:

- A program of archaeological monitoring must be conducted during potholing works at:
  - Marrickville Station
  - Lakemba Station
  - Footbridge works between Church Street and Hutton Street in the Canterbury Station precinct
- Archaeological monitoring would adhere to the AMS methodology provided in this document as well as relevant guidelines outlined the ARD for the project
- Significant fabric (such as platform coping or station platform buildings) near to areas of potholing should be protected from splash excavation material during the works. This would ensure that outer surfaces are kept clean during works.
- Following the completion of potholing works, all areas of investigation should be made good to restore the platform 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
- Potholing locations should not be moved from proposed locations outlined in this document. Should potholing locations be changed, this assessment may need to be revised and consultation with DPC Heritage may need to be repeated prior to works proceeding.
- Potholing works would be undertaken in accordance with the Sydney Metro Unexpected Finds Procedure.
- In the event that significant and intact remains not identified in the ARD or this archaeological assessment are encountered during works, all excavation works would cease, the remains would be protected, further assessment would be undertaken, and DPC Heritage would be notified.
  - If significant archaeological remains are identified which would be impacted by further potholing works, the potholing works may no longer be classified as low impact activities and further assessment, approval, and archaeological investigation would be required.

Please do not hesitate to contact me should you require clarification on any of the information contained in this letter.

Regards,

Jayden van Beek
Senior Heritage Consultant

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13 December 2019

Jonathan Steele
Senior Environmental Consultant
Mott MacDonald

Dear Mr Steele,

Re: Sydney Metro City and Southwest Design – Heritage impact assessment for soil resistivity testing, Marrickville and Canterbury Stations

Project background

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. As part of the Revised Environmental Mitigation Measures (REMM) for the project, NAH12 indicates that mitigation measures outlined in the Non-Aboriginal archaeological assessments[1][2] for the project must be adhered to during design, investigation and construction works for the project.

As part of investigative works for the project, Mott MacDonald are proposing to conduct service location and assessments at a number of locations throughout the proposed project area. Potholing service investigation works at Marrickville, Canterbury, Belmore and Lakemba Stations would be conducted in areas identified in SPIR assessments as archaeologically sensitive at these stations. This memo provides an assessment of built heritage and archaeological impacts for the potholing and service location works and outlines management guidelines for conducting the works in these areas.

[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.
[2] Artefact 2018b. *Sydney Metro City & Southwest Sydenham to Bankstown Upgrade – Historical Archaeological Assessment & Research Design*. Report to Transport for NSW.

Proposed works

Mott MacDonald are proposing to undertake service location works through potholing service investigation works at Marrickville, Dulwich Hill, Hurlstone Park, Canterbury, Campsie, Belmore, Lakemba, Wiley Park and Punchbowl railway stations.

Works would consist of non-destructive digging (NDD) excavation work, using high pressure water and vacuum suction (vacuum truck) excavation, as well as manual hand digging. Excavation works would be conducted to locate sanitary service pipes identified from Detailed Site Survey (DSS) plans for each station. Once sanitary pipes have been located during potholing excavation, some pipes may be opened to allow the insertion of drain cameras which would be extended into services to inspect their internal condition.

Previous assessments

This heritage assessment is based on historical and archaeological research provided in the previously prepared heritage reports for the Sydney Metro City and Southwest – Sydenham to Bankstown Project. The current assessment provides summaries of the historical and archaeological research prepared in these two reports but does not reproduce the historical context for these reports here. As such, this report should be read in conjunction with previously prepared heritage reports. Reports referenced in this assessment include:

- *Sydney Metro City & Southwest – Sydenham to Bankstown Non-Aboriginal Heritage Impact Assessment* (Artefact 2017)
- *Sydney Metro City & Southwest – Sydenham to Bankstown Historical Archaeological Assessment & Research Design* (Artefact 2018a)

This memo only assesses service location and assessment works that have been proposed to be conducted within the defined precinct boundaries of the Marrickville to Punchbowl station sites for the Sydney Metro City and Southwest project.

Authorship

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

Built heritage impact assessment

Direct (physical) impacts to heritage significant fabric

The proposed works would involve NDD and hand excavation at limited areas within the station platforms at all stations (potholing) to locate sanitary service pipes. Once located, some of these pipes may be opened and telescopic drain cameras inserted to inspect the interior pipe condition.

The potholing locations at each station are located within platforms or within the rail corridor. No potholing works are anticipated to take place in areas which would require the removal or alteration of significant heritage fabric.

Table 1 summarises heritage significant fabric located in or near the area of works at each station and outlines any direct (physical) impacts to heritage significant fabric at each station.

Table 1: Summary of direct heritage impacts

Station and significance	Significant fabric near area of works	Discussion of direct (physical) heritage impacts	Summary of impact
Marrickville Station **State**	• Platform 1 and 2 (Exceptional) • Platform 1 Building (Exceptional) • Platform 2 Building (High) • Platform 2 Booking Office (Exceptional)	The proposed works on platform 1 and 2 would involve removal of the asphalt on the platform surface for the assessment, recording and measurement of pipes within the platform. While the platform coping is considered exceptional significance fabric, asphalt surfaces and subsurface platform fill materials are not heritage significant fabric and the works would not physically impact the heritage significance of this element. Proposed works would not impact any original brick coping, drains, or door thresholds on either platform, or significant fabric associated with the platform buildings.	Neutral
Dulwich Hill Station **Local**	• Platform 1/2 (High) • Platform Building (High) • Stairs (Moderate)	The proposed potholing works would involve removal of the asphalt on the platform surface for the assessment, recording and measurement of pipes within the platform and cable feeding through extant service networks. While the platform coping is considered high significance fabric, asphalt surfaces and subsurface platform fill materials are not heritage significant fabric and the works would not physically impact the heritage significance of this element. Proposed works would not impact any significant fabric associated with the platform building (high significance), or the stairs (moderate) significance.	Neutral

Hurlstone Park Station **Local**	• Platform 1 (High) • Platform 2 (High) • Platform 1 Building (High) • Platform 2 Building (High)	Platform coping for platforms 1 and 2 were both identified as being of high significance fabric. The proposed potholing works would involve removal of the asphalt on the platform surface for the assessment, recording and measurement of pipes within the platform. While the platform coping is considered high significance fabric, asphalt surfaces and subsurface platform fill materials are not heritage significant fabric and the works would not physically impact the heritage significance of this element. Furthermore, it is not expected that the works would impact any significant fabric associated with the platform buildings (high significance), or the stairs (high significance).	Neutral
Canterbury Station **State**	• Platform 1 (High) • Platform 1 Building (Exceptional) • Platform 2 (High) • Platform 2 Building (High)	Platform coping for platforms 1 and 2 were both identified as being of high significance fabric. The proposed potholing works would involve removal of the asphalt on the platform surface for the assessment, recording and measurement of pipes within the platform. While the platform coping is considered high significance fabric, asphalt surfaces and subsurface platform fill materials are not heritage significant fabric and the works would not physically impact the heritage significance of this element. It is not expected that the proposed works would impact any original brick coping, drains, or door thresholds on either platform. Furthermore, it is not expected that the works would impact any significant fabric associated with the platform 1 building (exceptional significance) or the platform 2 Station building (high significance).	Neutral
Campsie Station **Local**	• Platform 1 (High) • Platform 2 (High) • Platform 1 Building (High) • Platform 2 Building (High)	Platform coping for platforms 1 and 2 were both identified as being of high significance fabric. The proposed potholing works would involve removal of the asphalt on the platform surface for the assessment, recording and measurement of pipes within the platform. While the platform coping is considered high significance fabric, asphalt surfaces and subsurface platform fill materials are not heritage significant fabric and the works would not physically impact the heritage significance of this element. It is not expected that the proposed works would impact any original brick coping, drains, or door thresholds on either platform. Furthermore, it is not expected that the works would impact any significant fabric associated with the platform buildings which are of high significance.	Neutral

		The car park areas on both the northern and southern sides of the railway corridor do not hold heritage significance or significant fabric, nor does the Belmore Training Facility. Service location works to the north of the station would take place near the locally significant Inter-War Bus Shelter and Lavatories heritage item (Canterbury LEP 2012 I29) but would not physically alter or impact this item.	
Belmore Station **State**	• Platform 1/2 (High) • Platform 1/2 Building (Exceptional)	Platform coping for platform 1 was identified as being high significance fabric. The proposed potholing works would involve removal of the asphalt on the platform surface for the assessment, recording and measurement of pipes within the platform. While the platform coping is considered high significance fabric, asphalt surfaces and subsurface platform fill materials are not heritage significant fabric and the works would not physically impact the heritage significance of this element. Furthermore, it is not expected that the works would impact any significant fabric associated with the platform building, which is of exceptional significance.	Neutral
Lakemba Station **Local**	• Platform 1/2 (High) • Platform 1/2 Building (High)	Platform coping was identified as being high significance fabric. The proposed potholing works would involve removal of the asphalt on the platform surface for the assessment, recording and measurement of pipes within the platform in five locations at the western end of the platform building and platform. While the platform coping is considered high significance fabric, asphalt surfaces and subsurface platform fill materials are not heritage significant fabric and the works would not physically impact the heritage significance of this element. It is not expected that the proposed works would impact any original brick coping, drains, or door thresholds on either platform. Furthermore, it is not expected that the works would impact any significant fabric associated with the platform building, which is of high significance.	Neutral
Wiley Park **Local**	• Platform 1 (High) • Platform 2 (High) • Platform 1 Building (High) • Platform 2 Building (High)	Platform coping on both platforms was identified as being high significance fabric. The proposed potholing works would involve removal of the asphalt on the platform surface for the assessment, recording and measurement of pipes within the platform. This would occur in two locations at the northern side of the platform 1 building. While the platform coping is considered high significance fabric, asphalt surfaces and subsurface platform fill materials are not heritage significant fabric and the works would not physically impact the heritage significance of this element. Works would also not involve modifying any physical portion of either the platform 1 or platform 2 station buildings.	Neutral

Punchbowl **Local**	• Platform (High) • Toilet Block on Platform (Moderate) • Platform Building (Moderate)	Platform coping was identified as being high significance fabric. The proposed potholing works would involve removal of the asphalt on the platform surface for the assessment, recording and measurement of pipes within the platform. Four potholes would be created, with one located at the northern side of the stairs, one at the north-west corner of the platform buildings, one at the north-eastern corner of the platform buildings, and one at the far eastern end of the platform. While the platform coping is considered high significance fabric, asphalt surfaces and subsurface platform fill materials are not heritage significant fabric and the works would not physically impact the heritage significance of this element. Works would also not involve modifying any physical portion of either the platform station buildings.	Neutral

Indirect (visual) impacts to heritage significance of

It is expected that the proposed works would replace the removed asphalt surfaces at all stations to their pre-existing condition following the completion of works. So long as reinstated platform surfaces are made good to match existing asphalt surfaces, the proposed works would not result in any adverse indirect (visual) heritage impacts at any station.

Archaeological impact assessment

Scope of assessment

The Archaeological Assessment and Research Design report (ARD) prepared for the Submissions and Preferred Infrastructure Report (SPIR) for the project provided a detailed archaeological assessment for the Metro South West line. This report determined that the only railway stations which had potential for significant archaeological remains were Canterbury, Belmore, Marrickville and Lakemba. The following archaeological impact assessment is provided only for these stations.

The full historical background and land use phases for each railway station can be found within the SPIR ARD report. Information provided here has been derived from this report.

This assessment of archaeological impacts refers only to areas of predicted significant archaeological remains which are situated in the same location as the proposed potholing works.

Marrickville Station

The proposed potholing works would take place within an area of predicted significant archaeological potential associated with the construction and use of the station between 1894 and 1939. The SPIR ARD report defined the following remains may be located within the area of potholing at Marrickville Station:[3]

- Archaeological remains associated with the early phase of railway infrastructure such as culverts, ceramic service pits, utilities such as woodstave sewer or ceramic pipes; brick drainage pits, electrical conduits and pits, stanchion bases, sleepers and rail track.

[3] Artefact 2018a: Table 3-4.

- Identified remains of original stone copings, earlier alignment of platforms, foot-scrapers, buried services, original lever set, footings of former platform stairs, platform brick dwarf walls, and building footings
- Moderate potential for footings of former platform canopies

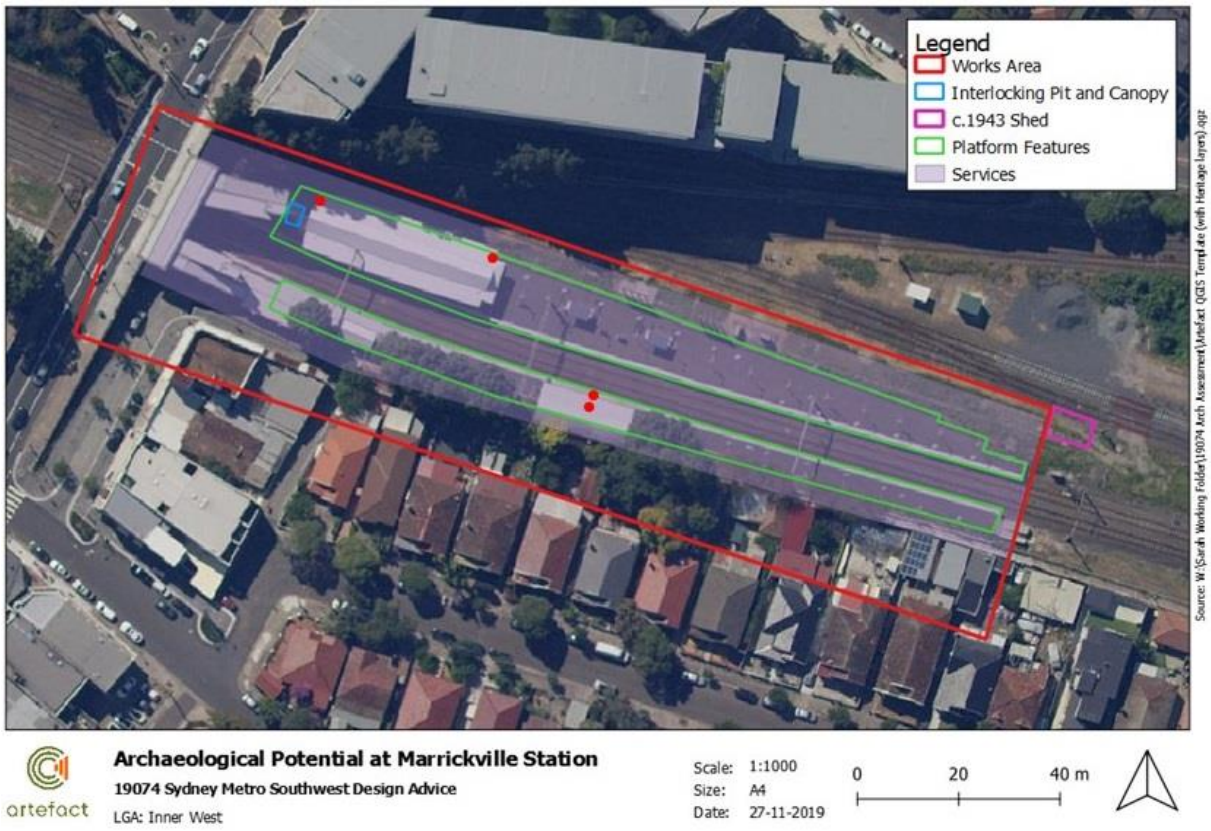
These remains were predicted to be of local heritage significance. The location of potholing works in relation to predicted archaeological features at Marrickville Station is illustrated in Figure 1 below.

Potholing works would be located in areas where existing sanitary service pipes are suspected to be located, and as such, archaeological deposits or features are not anticipated in areas which have already been ground disturbed. While there is a moderate potential for archaeological remains to be located throughout the station platform areas, it is anticipated that the presence of these service pipes would have reduced the degree of archaeological potential in the localised areas where potholing would be conducted.

Potholing works are limited in size and vacuum truck and manual excavation work would not likely adversely impact any buried structural remains. Significant artefactual remains, which may be impacted by vacuum truck excavation, are not predicted to be located within the areas of potholing. Overall, the potholing works would result in a negligible impact to predicted significant archaeological remains at Marrickville Station.

These potholing works would take place within an area identified as Management Zone 1 within the SPIR ARD report. Ground disturbing works in this area would have to adhere to methodologies provided in a work specific Archaeological Method Statement (AMS), which is provided at the end of this report.

Figure 1. Areas of archaeological potential at Marrickville Station, location of potholing shown as red circles



Canterbury Station

The proposed potholing works would take place within an area of predicted significant archaeological potential associated with the construction and use of the station between 1895 and 1943. The SPIR ARD report defined the following remains may be located within the area of potholing at Canterbury Station:[4]

- Archaeological remains and evidence of early railway construction including rails, refuse pits, drains and timber sleepers
- Archaeological remains of former platform structures
- Archaeological remains of the former race platform and retaining wall
- Archaeological remains of the storage sidings for the Canterbury Racecourse special trains and the shunting of the local goods sidings
- Archaeological remains of early infrastructure such as culverts, tanks, drains (brick, stone or concrete), electrical conduits and pits, sleepers, signalling equipment and rail track
- Archaeological remains associated with the early phase of minor railway buildings (such as toilets) prior to track realignment such as postholes, brick footings, former floor surfaces, and early infrastructure such as ceramic service pipes, brick drainage pits, electrical conduits and pits, stanchion bases, sleepers and rail track
- It is unlikely that artefact-bearing deposits associated with the early station accumulated or survived subsequent development and upgrades

These remains were predicted to be of local heritage significance. The location of potholing works in relation to predicted archaeological features at Canterbury Station is illustrated in Figure 2 below.

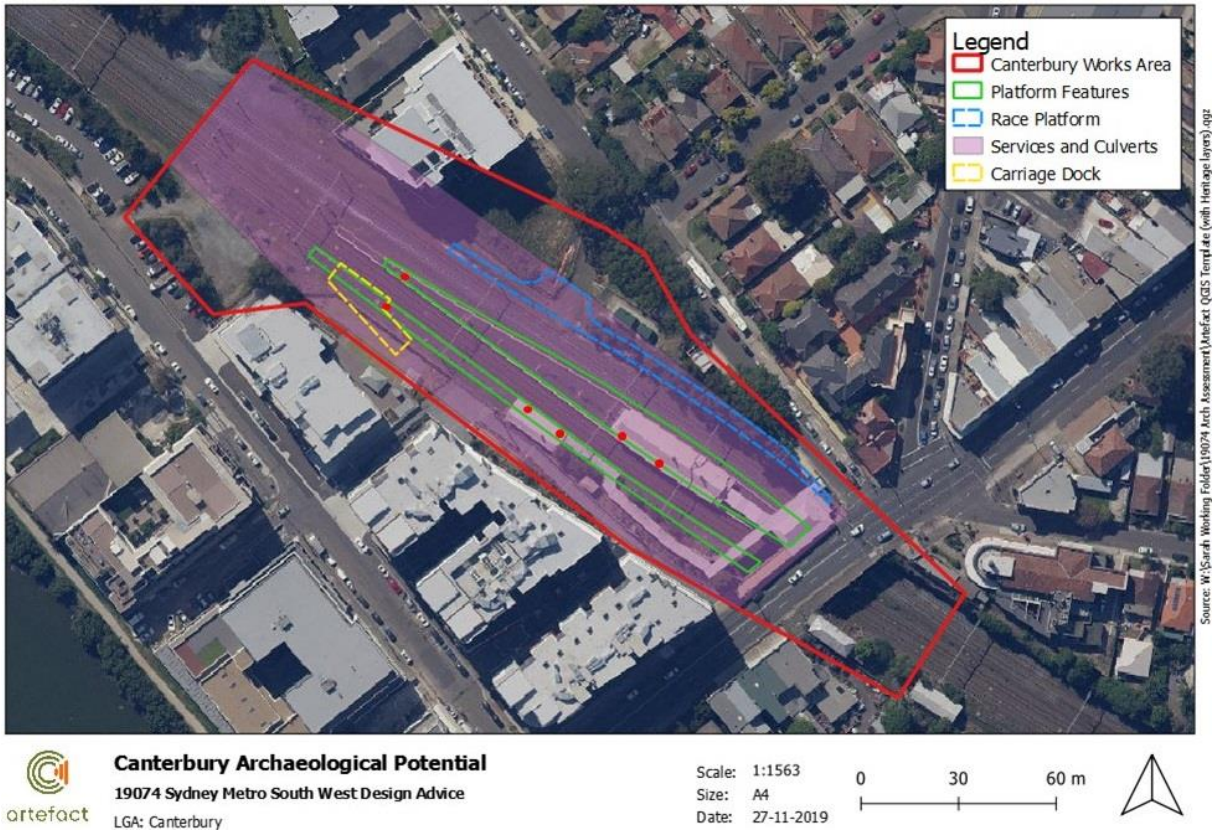
Potholing works would be located in areas where existing sanitary service pipes are suspected to be located, and as such, archaeological deposits or features are not anticipated in areas which have already been ground disturbed. While there is a moderate potential for archaeological remains to be located throughout the station platform areas, it is anticipated that the presence of these service pipes would have reduced the degree of archaeological potential in the localised areas where potholing would be conducted.

Potholing works are limited in size and vacuum truck and manual excavation work would not likely adversely impact any buried structural remains. Significant artefactual remains, which may be impacted by vacuum truck excavation, are not predicted to be located within the areas of potholing. Overall, the potholing works would result in a negligible impact to predicted significant archaeological remains at Canterbury Station.

These potholing works would take place within an area identified as Management Zone 2 within the SPIR ARD report. Ground disturbing works in this area would have to adhere to methodologies provided in a work specific AMS, which is provided at the end of this report.

[4] Artefact 2018a: Table 4-3.

Figure 2. Archaeological Potential at Canterbury Station (pothole locations in red)



Belmore Station

The proposed potholing works would take place within an area of predicted significant archaeological potential associated with the construction and use of the station between 1880 and 1930. The SPIR ARD report defined the following remains may be located within the area of potholing at Belmore Station:[5]

- Archaeological features associated with continued grazing and farming include fence line and shed postholes, field drains, isolated artefact scatters and drains or culverts
- Archaeological remains of early infrastructure such as ceramic service pipes, brick drainage pits, electrical conduits and pits, stanchion bases, sleepers and rail track
- Archaeological remains located on the 1925 plan such as converter room, coal bin, ash pit, lamp shed, auto box, land agent, boot maker, toilets, and brick culvert. Archaeological remains could include footings, cuts of the pit, drains, ceramic service pipes, and the brick culvert.

These remains were predicted to be of local heritage significance. The location of potholing works in relation to predicted archaeological features at Belmore Station is illustrated in Figure 3 below.

Potholing works would be located in areas where existing sanitary service pipes are suspected to be located, and as such, archaeological deposits or features are not anticipated in areas which have already been ground disturbed. While there is a moderate potential for archaeological remains to be

[5] Artefact 2018a: Table 5-3.

located throughout the station platform areas, it is anticipated that the presence of these service pipes would have reduced the degree of archaeological potential in the localised areas where potholing would be conducted.

Potholing works are limited in size and vacuum truck and manual excavation work would not likely adversely impact any buried structural remains. Significant artefactual remains, which may be impacted by vacuum truck excavation, are not predicted to be located within the areas of potholing. Overall, the potholing works would result in a negligible impact to predicted significant archaeological remains at Belmore Station.

These potholing works would take place within an area identified as Management Zone 2 within the SPIR ARD report. Ground disturbing works in this area would have to adhere to methodologies provided in a work specific AMS, which is provided at the end of this report.

Figure 3. Archaeological potential at Belmore Station (pothole locations in red)

Lakemba Station

The proposed potholing works would take place within an area of predicted significant archaeological potential associated with the construction and use of the station between 1909 and 1919. The SPIR ARD report defined the following remains may be located within the area of potholing at Lakemba Station:[6]

[6] Artefact 2018a: Table 6-3.

- Archaeological remains associated with the first timber island platform and initial railway infrastructure such as brick drainage pits, electrical conduits and pits, stanchion bases, timber footings and postholes, sleepers and rail track.

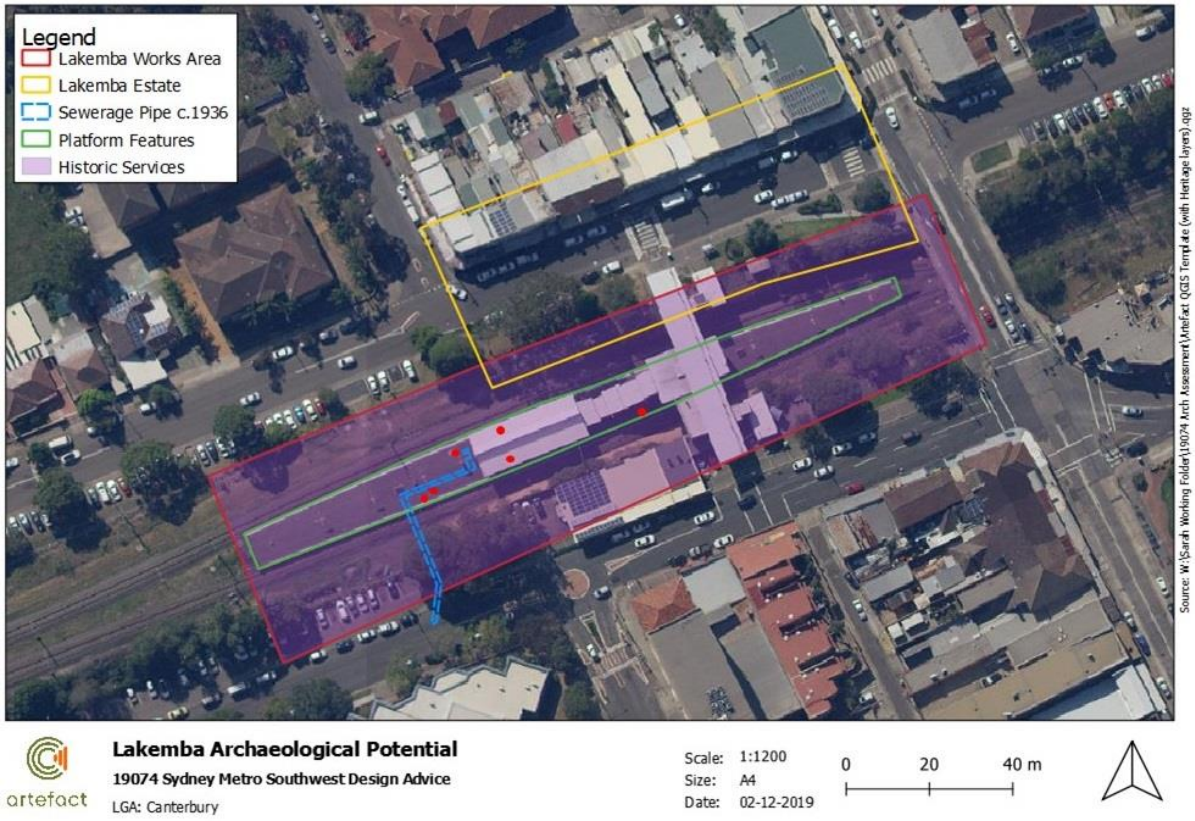
These remains were predicted to be of local heritage significance. The location of potholing works in relation to predicted archaeological features at Lakemba Station is illustrated in Figure 4 below.

Potholing works would be located in areas where existing sanitary service pipes are suspected to be located, and as such, archaeological deposits or features are not anticipated in areas which have already been ground disturbed. While there is a moderate potential for archaeological remains to be located throughout the station platform areas, it is anticipated that the presence of these service pipes would have reduced the degree of archaeological potential in the localised areas where potholing would be conducted.

Potholing works are limited in size and vacuum truck and manual excavation work would not likely adversely impact any buried structural remains. Significant artefactual remains, which may be impacted by vacuum truck excavation, are not predicted to be located within the areas of potholing. Overall, the potholing works would result in a negligible impact to predicted significant archaeological remains at Lakemba Station.

These potholing works would take place within an area identified as Management Zone 2 within the SPIR ARD report. Ground disturbing works in this area would have to adhere to methodologies provided in a work specific AMS, which is provided at the end of this report.

Figure 4. Archaeological potential at Lakemba Station (pothole locations in red)



Approval pathway

Low impact activities

The instrument of approval for the project was approved on 12 December 2018, and provides the following description of low impact activities in that document:[7]

> *(b) investigations including investigative drilling and excavation;*
>
> *(i) archaeological testing under the Code of practice for archaeological investigation of Aboriginal objects in NSW (DECCW, 2010) or archaeological monitoring undertaken in association with (a)-(h) above to ensure that there is no impact on heritage items*

The instrument of approval also states that:

> *However, where heritage items on the State heritage register, areas of known or expected archaeological potential, … are affected by any low impact activity, that activity is construction, unless otherwise determined by the Planning Secretary, following consultation by the Proponent with OEH (*Office of Environment and Heritage – now Department of Premier and Cabinet [DPC] Heritage*)….*

The potholing works are being conducted for service investigation for sanitary services. The proposed works would result in neutral adverse impacts to heritage significant fabric and negligible impacts to predicted archaeological resources. As such, these works would be considered Low Impact environmental activities, and can be progressed in advance of the preparation of the overall Construction Environmental Management Plan (CEMP) for the project works.

As such, consultation should be conducted with DPC Heritage for the potholing works at the following State heritage registered stations, where works are also taking place within areas of identified non-Aboriginal archaeological potential:

- Marrickville Station
- Canterbury Station
- Belmore Station.

DPC Heritage should also be consulted for potholing works at the Lakemba Station, as potholing works would take place within an area of identified archaeological potential.

Following confirmation that the works are approved as low impact activities, the potholing works should be conducted in accordance with the management strategy outlined in the archaeological method statement provided below. The potholing works should also adhere to the following management recommendations for works at all stations:

- Significant fabric (such as platform coping or station platform buildings) near to areas of potholing should be protected from splash excavation material during the works. This would ensure that outer surfaces are kept clean during works.

[7] NSW Planning and Environment, 12 December 2018. *Infrastructure Approval for SSI 8256*. Accessed online at http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8256.

- Following the completion of potholing works, all areas of investigation should be made good to restore the platform 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
- Potholing locations should not be moved from proposed locations outlined in this document. Should potholing locations be changed, this assessment would need to be revised and consultation with DPC Heritage may need to be repeated prior to works proceeding.

Archaeological management zones

Marrickville Station

Potholing works at Marrickville Station would be conducted within an area identified as Zone 1 within the SPIR ARD report. This indicates that works would have the potential to result in direct impacts to significant archaeological remains. An archaeological method statement must be prepared for works in this area once the construction methodology and assessment of impacts are known.

Non-Aboriginal archaeological test or salvage excavation within this area was recommended in the SPIR ARD report. However, as the works would result in a negligible direct impact to archaeological remains, and the small scope of the ground disturbing works (potholing), this assessment recommends archaeological monitoring as a strategy better suited to managing potential inadvertent archaeological impacts during potholing works.

Canterbury, Belmore and Lakemba Stations

Potholing works at Canterbury, Belmore and Lakemba Stations would be conducted within areas identified as Zone 2 within the SPIR ARD report. This indicates that works would have the potential to result in impacts to significant archaeological remains. An archaeological method statement must be prepared for works in this area once the construction methodology and assessment of impacts are known. Archaeological investigation is likely required.

Due to the negligible degree of impact on predicted archaeological remains, and the small scope of ground disturbing works (potholing), archaeological monitoring is recommended archaeological management during the works.

Archaeological method statement

Archaeological monitoring

All potholing works would be archaeological monitored. Archaeological monitoring involves the nominated archaeologist/s being present during ground disturbance works which may impact on locally significant archaeological remains. If archaeological remains are encountered, works in the immediate area would cease until the archaeologist/s has adequately investigated and recorded the remains. Truncated and disturbed remains, which are not significant or do not have research potential, such as former rail infrastructure would be recorded and removed if necessary.

All subsurface remains would be archaeologically recorded. Archaeological recording would involve photographing the proposed works and writing a monitoring diary detailing the occurring works and

any archaeological finds. Any archaeological remains would be photographed in situ and significant remains would be illustrated in plan form by the archaeologist.

In the event that significant and intact remains not identified in the ARD or this archaeological assessment are encountered during works, all excavation works would cease, the remains protected, further assessment undertaken, and DPC Heritage would be notified. If significant archaeological remains are identified which would be impacted by further potholing works, the potholing works may no longer be classified as low impact activities and further assessment and archaeological investigation would be required.

Archaeologists would not be required to monitor backfilling, reinstatement of asphalt and other ground surfaces, or any drain camera investigation works which do not involve any ground excavation.

Conclusions and Recommendations

The proposed works would involve potholing excavation within the station platform areas at nine heritage listed railway stations on the T3 Bankstown Line. These works would not result in adverse impacts to heritage significant fabric.

The proposed works would involve potholing excavation within four areas where the potential for locally significant archaeological remains have been identified. The proposed works would not likely result in adverse impacts to heritage significant archaeological remains. Stations where potholing works would be conducted within archaeologically sensitive areas are:

- Marrickville Station
- Canterbury Station
- Belmore Station
- Lakemba Station

These works would be classified as low impact environmental activities under the instrument of approval for the project. As works at Marrickville, Canterbury and Belmore stations are taking place within the curtilage of heritage items listed on the State Heritage Register, and works at Lakemba would take place in an area of predicted significant archaeological remains, DPC Heritage should be consulted to confirm that these works would be considered low impact environmental activities.

During potholing works, the following recommendations are provided to ensure that inadvertent impacts to significant fabric and archaeological remains occurs:

- 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.
- Significant fabric (such as platform coping or station platform buildings) near to areas of potholing should be protected from splash excavation material during the works. This would ensure that outer surfaces are kept clean during works.
- Following the completion of potholing works, all areas of investigation should be made good to restore the platform 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
- Potholing locations should not be moved from proposed locations outlined in this document. Should potholing locations be changed, this assessment would need to be revised and consultation with DPC Heritage may need to be repeated prior to works proceeding.

Attachment 2 – Heritage NSW correspondence

From:	Fethers, Ben
To:	Fethers, Ben
Subject:	FW: Southwest Metro Design Services Project
Date:	Thursday, 2 April 2020 10:13:52 PM
Attachments:	image001.png

From: Sarah Jane Brazil <SarahJane.Brazil@environment.nsw.gov.au>
Sent: Wednesday, 1 April 2020 1:28 PM
To: Ivanova, Elena <Elena.Ivanova@arcadis.com>
Cc: Alexander Timms <Alexander.Timms@environment.nsw.gov.au>
Subject: Southwest Metro Design Services Project

Dear Elena

Thank you for providing us the opportunity to comment on low impact investigation works for the Southwest Metro Design Services Project. This consultation is carried out in accordance with the Conditions of Approval for the approved Sydney Metro Project, City & Southwest to Sydenham to Bankstown SSI 8256.

The below documents were provided with your submission.

- Letter report addressed to Jonathan Steele, Mott McDonald, *Re: Sydney Metro City and Southwest Design – Heritage impact assessment for soil resistivity testing, Marrickville and Canterbury Stations*. Prepared by Artefact Heritage, 13 December 2019.
- Letter report addressed to Jonathan Steele, Mott McDonald, *Re: Sydney Metro City and Southwest Design – Heritage impact assessment for utility service investigation*. Prepared by Artefact Heritage, 14 February 2020.

A review of the above documents has been carried out and the following comments are made.

Sanitary Pipe Survey
Archaeology – Specialist Services Team Review
The proposed works would involve NDD and hand excavation at limited areas within the station platforms at all stations (potholing) to locate sanitary service pipes. Once located, some of these pipes may be opened and telescopic drain cameras inserted to inspect the interior pipe condition. As the pipes are in existing disturbed service trenches, there would be no archaeological impact. There is no objection to the works on archaeological grounds, the works are 'low impact'.

Built Heritage - MP Team Review
The potholing locations at each station are located within platforms or within the rail corridor. The works do not require the removal or alteration of significant heritage fabric. There is no objection to the works on built heritage grounds, the works are 'low impact'.

Potholing for Utility Service Locations
Archaeology – Specialist Services Team Review
The proposed works would involve NDD and hand excavation at limited areas across the rail corridor and some station areas (potholing) to locate utility service pipes. Utility service pipes, once uncovered, would not be modified or impacted in any way.
There is no objection to the works on archaeological grounds, it is agreed the works are 'low impact'.

Built Heritage - MP Team Review
The potholing locations at each station are located within platforms or within the rail corridor. The works do not require the removal or alteration of significant heritage fabric. There is no objection to the works on built heritage grounds, the works are 'low impact'.

If you have any queries regarding the above comments, please contact Alexander Timms, Senior Heritage Officer at Heritage NSW on (02) 8837 6067 or at alexander.timms@environment.nsw.gov.au

Please submit future submissions to heritagemailbox@environment.nsw.gov.au

Regards

Sarah Jane Brazil | Major Projects
Heritage NSW
Community Engagement, Department of Premier and Cabinet
T: 02 9895 6510 | sarahjane.brazil@environment.nsw.gov.au

Please send any referrals or statutory applications to heritagemailbox@environment.nsw.gov.au

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Attachment 3 – Environmental Risk Assessment

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	3	Moderate	• Site equipment is to be turned off when not in use • Stockpiles are to be covered during windy weather • Visual observation of dust emissions will trigger dust suppression mitigation strategies, including wetting of the excavation area • Induction and pre-start briefing to include noise mitigation and "good neighbour" approach • Follow the appropriate approval process and submit OOHW applications for Environmental Representative approval. • Mitigation measures to be implemented in accordance with the Sydney Metro City & Southwest Construction Noise and Vibration Strategy (CNVS), including appropriate notification.	5	4	Low
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, 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 • No refueling will occur in the work area	4	5	Low

Aspect	Potential environmental impact	Initial risk rating			Control measures	Residual risk rating		
		Consequence	Likelihood	Risk		Consequence	Likelihood	Risk
					• Spill kits will be kept near to work areas at all times and trained staff present in case of a spill			
Work in heritage areas	Potential impacts to heritage may occur as a result of investigation works.	4	3	Moderate	• Environmental sensitivities maps will be provided to surveyors as part of the site induction process to ensure heritage areas are avoided. • A program of archaeological monitoring is to be conducted (in accordance with the AMS methodology provided in the HIA as well as the ARD for the project) for ground disturbing works at Marrickville station, Lakemba Station, Belmore Station, Canterbury Station and the Footbridge works between Church Street and Hutton Street (in the Canterbury Station Precinct). • Works proximal to significant local heritage items (such as platform coping, or station platform buildings) should be protected from splash excavation material during the works to ensure outer surfaces are kept clean during works. • Potholing locations proximal to locally significant heritage items should not be moved from the proposed locations outlined in the HIA's (Appendix 5 of PCMW-007). If potholing locations are changed, a revised assessment and further consultation with DPC may	4	5	Low

Aspect	Potential environmental impact	Initial risk rating			Control measures	Residual risk rating		
		Consequence	Likelihood	Risk		Consequence	Likelihood	Risk

					need be required prior to works proceeding.
					• Following the completion of works, all areas of investigation should be made good to restore the platform surfaces to their original appearance. This would include:
					  • Cleaning all asphalt, concrete and brick surfaces that may have been dirtied during works
					  • Ensuring that platform asphalt surfaces are reinstated following the completion of backfilling so that they match surrounding asphalt surfaces
					• Works will be undertaken in accordance with the Sydney Metro City and Southwest Unexpected Finds Procedure V2.0 for heritage
					• In the event that significant and intact remains not identified in the ARD or archaeological assessment are encountered during works, all excavation works would cease, the remains would be protected, further assessment would be undertaken, and DPC Heritage would be notified.
					  • If significant archaeological remains are identified which would be impacted by further potholing works, the potholing works may no longer be classified as			

Aspect	Potential environmental impact	Initial risk rating			Control measures	Residual risk rating		
		Consequence	Likelihood	Risk		Consequence	Likelihood	Risk
					low impact activities and further assessment, approval, and archaeological investigation would be required.			
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.	6	6	Low	• Environmental sensitivities maps will be provided to surveyors as part of the site induction process to ensure biodiversity areas are avoided • Survey locations will be moved to grassed areas and unvegetated land to preclude the requirement for trimming, removal or impact to other vegetation by the works	6	6	Low
Erosion and sedimentation control	Runoff of excavated materials into the local stormwater system. Potential for escape of contaminated materials causing local contamination.	4	4	Moderate	• Stockpiled material will be stored out of drainage channels and covered during inclement weather	4	5	Low
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 • Personnel will park legally and observe restrictions at all times • If investigation works impact footpaths and roads, works will be carried out under a council-approved traffic control plan (TCP), using traffic controllers to manage pedestrian and vehicle flow • Road occupancy licenses (ROL) will be acquired from	5	6	Low

Aspect	Potential environmental impact	Initial risk rating			Control measures	Residual risk rating		
		Consequence	Likelihood	Risk		Consequence	Likelihood	Risk
					RMS for all investigations on RMS roads within 100m of a traffic light where road or lane closures are required • Road opening permits (ROP) will be acquired from council for all intrusive investigation in council land • Controls will be implemented in accordance with the ROL/ROP/Traffic Control Plan (TCP) • Personnel will be inducted on the required control measures that must be implemented • Where possible survey work in roadways will be undertaken in off peak times to minimise congestion			
Service strike	Damage to services during excavation which cause an environmental incident	4	4	Moderate	Prior to any ground disturbance works, a 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	4	5	Low

Aspect	Potential environmental impact	Initial risk rating			Control measures	Residual risk rating		
		Consequence	Likelihood	Risk		Consequence	Likelihood	Risk
					locator once confirmed clear, approx. 1m square section			
Waste	Improper management of waste could result in an environmental incident	4	4	Moderate	The following measures would be implemented: • Induction of staff will include waste management practices • Non-liquid excess soil and wastes will be bagged and removed from site. • Liquid wastes will be collected during work in a mud tank prior to disposal at a licenced facility • Excess soil and waste will be tested in accordance with the Waste Classification Guidelines (NSW EPA, 2014) prior to disposal. • Wastes will be lawfully transported and disposed of.	4	5	Low