

Former Macdonaldtown Gasworks Archaeological Research Design

March 2010

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1 INTRODUCTION

1.1 BACKGROUND

City Plan Heritage has been engaged by Incoll on behalf of Rail Corporation New South Wales (RailCorp) to prepare an Archaeological Research Design to accompany an Excavation Permit Application under Section 60 of the *NSW Heritage Act 1977* (as amended). The Research Design is a requirement for the archaeological test excavation proposed for the site.

The subject site was assessed for archaeological potential by Banksia Heritage and Archaeology for NSW State Rail in April 2004 and then in November 2006 by Heritage Concepts Pty Ltd for Parsons Brinckerhoff Australia. These reports are included with this Archaeological Research Design as they provide the significant background material for this application. City Plan Heritage have been engaged to carry out the test trenching programme, to archivally record the site, and to produce the relevant excavation reports and a Heritage Interpretation Strategy for the site, in accordance with NSW Heritage Office guidelines. The previous reports and Railway histories were provided and are considered sufficient for the purpose of the current archaeological investigations. The scope of works for the project did not include for additional historical research.

1.2 SITE LOCATION

The former Macdonaldtown Gasworks site is located off Burren Street, Erskineville and covers an area of 7,732 square metres. It is identified as Part Lot 50 in DP1001467 and the land is zoned "Railways Zone" under the Sydney Regional Environment Plan No 26 (SREP 26). The site is listed on the State Heritage Register (SHR 01140) as part of the Eveleigh Railway Workshops, and it is included in the S.170 Heritage Register (SRA102) with particular listing for the standing gasholder. The site is bound to the north by the Macdonaldtown Stabling Yard (owned by RailCorp), to the east and south by the Illawarra Rail Line (owned by RailCorp), and to the west by privately owned residential properties on Burren Street. See the plans and aerial photographs overleaf, and at Appendix Two. The proximity to the residential dwellings is a major consideration in the remedial approach to be adopted for the site.

The gasworks site is currently used for the ad-hoc storage of railway materials and is secured by an 1800mm high chainwire fence on most boundaries, with the exception of a 20-metre gap on the southern site boundary adjoining the Illawarra Rail Corridor. A concrete noise wall has recently (2007) been constructed along the southern boundary of the site to mitigate noise impacts associated with stabling of trains in the area. The site is generally covered by low lying weeds, shrubs and trees, and some small stockpiles of soil, fill materials and other wastes are present. The main site feature is a standing gasholder that is positioned close to the western site boundary. The gasholder consists of an aboveground steel frame, with a telescoping steel bell (in two sections) which rests inside a brick annulus (underground). The gasholder is approximately 20 metres in diameter and 12-13 metres in height. The annulus is approximately 6 metres deep at the outer edge and the base of the annulus is likely to be domed in the centre.

Other site features include the brick annulus of a second gasholder to the north of the standing gasholder (this was previously demolished and filled with various waste materials), two tar pits, a disused signal hut, and a number of concrete slabs / retaining walls on the northern site boundary. Railway services are also present within a ground level concrete trough on the western embankment and a Sydney Water sewer line is located beneath this same embankment.



Figure 1: Map showing the location of the subject site, MacDonaldtown Gasworks, in relation to the wider area and railway stations and RailCorp properties, also refer below. (Source: Google maps online)



Figure 2: The site plan provided by RailCorp NSW, with the adjacent railway properties identified. The approximate area of the site is indicated here in red.

1.3 METHODOLOGY

This Archaeological Research Design has been prepared in accordance with the *NSW Heritage Manual* 'Archaeological Assessment' guidelines. The philosophy and process adopted is that guided by the Australia ICOMOS *Burra Charter 1999*.

1.4 LIMITATIONS

The proposed program of archaeological testing was decided in view of the planned remediation of the site. The program was designed to determine if the removal of the contaminated fills will have any impact on structures which may survive under the surface and on currently exposed structures. The location of the test trenches has been guided by the two previous archaeological assessments undertaken by Banksia Heritage + Archaeology and by Heritage Concepts. The site is a secure site and continues to be used as a storage facility by RailCorp. To date the authors were not able to get access to the site.

1.5 AUTHOR IDENTIFICATION

The following report has been prepared by Gina Scheer, (Heritage Consultant), in conjunction with Franz Reidel, (Archaeology Excavation Director) and Kerime Danis, (Manager, City Plan Heritage).

2 THE REMEDIATION PROPOSAL

2.1 REMEDIATION IMPACT ON THE ARCHAEOLOGICAL REMAINS

RailCorp owns a triangular area of land located off Burren Street, Macdonaldtown which formerly operated as a gasworks. It is located adjacent to the Eveleigh Railway Works and originally operated, up until the 1950s as part of that workshop. The buildings located on the land were cleared or demolished in the 1950s, with the exception of a standing Gas holder, reported to be the only example left standing in NSW. Archaeological assessment reports carried out in 2004 and 2006 noted that archaeological remains are still located at the site, including the brick ring of the second and demolished gasholder.

Previous environmental investigations carried out from 2000 through to 2008 on the site for RailCorp identified the presence of coal by-products; including tar, coke and ash throughout the central portion of the site where the processing activities were performed. Contaminated fill materials, mainly comprising coke, ash and demolition waste, were also identified in other areas of the site. This contamination has been declared by the NSW Environment Protection Authority (EPA) to pose a Significant Risk of Harm to human health and/or the environment, as defined by the *Contaminated Land Management Act* 1997 (CLM Act).

RailCorp is therefore initiating an overall remediation project which has two separate phases. The first phase of the project ("Planning Phase") will provide greater definition in relation to a number of key project constraints, and will therefore allow more accurate scoping of the second phase ("Remediation Phase"). RailCorp plans to remediate and validate the site in order to allow the preparation of a Site Audit Statement (SAS) by an EPA Accredited Site Auditor, declaring the site suitable for Commercial/Industrial Use (railway purposes).

The first, Planning Phase, includes a Part 3A Project Approval under the *Environmental Planning & Assessment Act* 1979 (EP&A Act). This includes community consultation, geotechnical and heritage assessment works as well as project management services associated with these works. It is the subsequent stage, i.e. the physical remediation works of the overall project that will impact on the site. As part of the planned remediation, excavations will take place across the site. The proposed remedial action plan that RailCorp will follow was provided to City Plan Heritage.¹ The known archaeological remains and remnant structures will most likely be affected by the excavations and soil clearance. They will also need to be identified and protected, if necessary, from heavy machinery and vehicles during the site remediation process. Therefore, a programme of test excavations is planned for the site in order to assess and identify the remains, prior to the remediation.

¹ Remedial Action Plan, Former Macdonaldtown Gasworks – Burren Street, Erskineville, NSW Final Report, by CH2MHILL, to Rail Corporation NSW, December 2007

3 HISTORY – SITE OCCUPATION AND LAND USE

The following is a summary of the historical development of the site. The sources for the history are listed in the Bibliography for this report. A site history was also undertaken for the 2004 archaeological assessment of the site, by Banksia Heritage + Archaeology.

The area was part of the first land grants made to Nicholas Devine (Divine). He was the superintendent of convicts in Sydney from 1790 until 1808. After arrival in the colony from Ireland, Devine had been granted 120 acres (49 ha) at Bulanaming, near Newtown, and he received a further 90 acres (36 ha) there in October 1799. These grants he named Burren Farm, after his birthplace. He established a house on the property and lived there until his death in 1830.² The land then became the subject of a legal battle between his heirs. It was not until the 1850s that a settlement was finally arranged by the landowners to compensate the heir.³

The gasworks at Macdonaldtown was constructed on part of the land resumed by the Crown for railway purposes, see Figure 3. The railway system was established in 1855, with the western line from the city (Central) initially to Granville. This set the boundary line for the north-western side of the Macdonaldtown triangle.

The southern boundary was formed by the 1857 establishment of the Illawarra line, with Erskineville Station opening nearby the subject site in 1884 to serve the rapidly expanding population (due to subdivision of the large estates). The railway station at Macdonaldtown was opened in 1878 at a site slightly west of the current location, adjacent to Charles Street. The main suburban railway line through Macdonaldtown was quadruplicated in 1892, which is when the station was reportedly moved to its present site, near the Gasworks. The third boundary, was the rear of the residential lots located along the northern side of Burren Street. The triangle of land comprising the subject site does not appear to have been actively used from the 1850s through to the 1890s construction of the Gasworks operations on the site.

In 1878 the Railway Commissioner entered into an agreement with a Mr. John Louis Castner to fit and maintain the new gas lights in carriages and to supply gas for them from his works at Redfern for a period of five years. Castner went on to operate gasworks for the railways at Redfern, Newcastle, Bathurst and Junee. The Railway Commissioners took over Castner's works in 1884. The Railways subsequently established works at Werris Creek, a second works at Junee, two further works at Redfern in Sydney, and the subject site at Eveleigh.

² Australian Dictionary of Bibliography online, http://www.adb.online.anu.edu.au/adbonline.htm ³ Pollon, F., 1988, 102

The land of the subject site was acquired by the railways from 'Trust J. Wilson' on 2 July 1888. The subject site has been in railway ownership ever since, with none of the original parcel of land sold.



Figure 3: undated, c.1890s plan of Newtown Municipality showing the residential subdivisions around the railway line infrastructure. (Source: City of Sydney Council Archives, Newtown Borough)

The December 1917 article by a Railways Gas Superintendent, H. C Brooks, entitled *Railway Gasworks and Gas making Macdonaldtown* has provided valuable information on the working of the site and the processes that were involved in manufacturing and processing gas. Brooks states that the existing works were erected in the year 1892. *"The type of settings are of generator principal, the retorts and furnaces being shovel fed."*⁴ He also noted that little additions beyond expected maintenance and repairs were made in the years up to 1917.

The nature of the works on site was also described in a 2003 article for the Bulletin of the Australian Railway Historical Society by Jim Longworth. He noted that:

"In addition to producing gas for burning, the works produced vast quantities of coke that was used in the dozens of coke-fuelled low temperature forges that were scattered around the various shops within the Eveleigh workshops."⁵

Longworth also provided a chronology of the Gasworks site use in his 1999 report to the State Rail Authority of NSW. The dates and details are as follows:

⁴ Brooks, H.C., 1917, 68

⁵ Longworth, J., "A brief history of NSW Railway Gasworks", 2003, 207

In 1892 the Eveleigh gasworks were completed. While the location and overall form of the works was built as per the designs, the detailed layout of the various components that comprised the works as finally built was slightly different to that as originally proposed.

Nothing further is mentioned until the 1940s. In c.1942 – there were two tar wells in use on the site, and there was a proposed connection of the 'Aeration Cylinder for Waste Water' to the sewer. During 1944, 1945, 1949, 1950, and 1952, minor modifications were made to the works. (SRA Archives - Macdonaldtown Large Station Card.)

1950s – The use of inferior coal damaged the machinery and on-site production of gas therefore ceased. The tanks were used to store gas that had been piped from the Railway Gasworks at the Mortlake Central Distribution Plant. Longworth notes that in about 1958 the gas producing plant was demolished.

In 1962, the southern gas holder, which was the holder used for storing gas for station lighting is shown as extant.

Mid 1970s the site is finally closed down as a pumping and gas storage plant. Today the land is vacant railway corridor land with the southernmost gas holder still extant.⁶

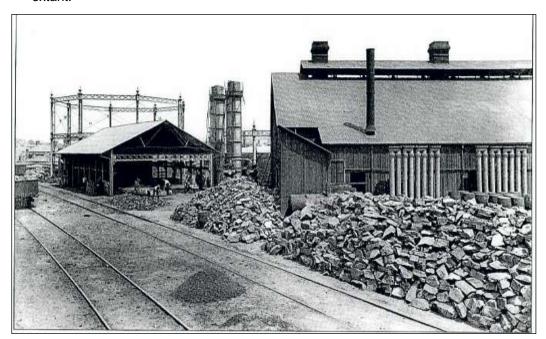


Figure 4: The Gasworks, photo, c.1917. This view shows the western end of the retort house, condensers, washers, purifiers (in the open sided shed) and gas holders, one just visible behind the retort house. (Source: Image from NSW Railway and Tramway Magazine, December 1917, p.68)

⁶ Longworth, J. 1999, 3

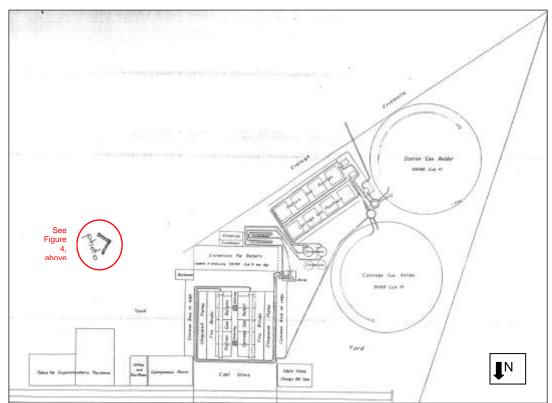


Figure 5: The Gas Works Eveleigh General Arrangement, plan c.1917. This plan names each section of the structures on the site. It dates from the same period as the photo on the previous page at Figure 4.

(Source: Reproduced in Eveleigh Gasworks Site History, 1999 Jim Longworth, Rail Services Australia Environmental Services)



Figure 6: The 1943 aerial of the subject site showing the buildings and structures during the operation of the Gasworks. The approximate site area is outlined in red. (Source: NSW Department of Lands Spatial Information Exchange.)

During the 2000s, residents of the adjacent Burren Street properties were using part of the vacant land of the subject site for recreational purposes. In 2010 the triangle of land continues to be used by Railcorp as rail storage land. The area is not accessible, as the access from Burren Street, adjoining the residential properties is securely locked. The known contamination of the soil on the site is one reason for the area to be locked. The site has been subject to a number of environmental assessments.

3.1 PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

The subject site has been subject to two archaeological assessments in the past, with differing recommendations. Both of these assessments are attached to this report. The 2004 Banksia Heritage + Archaeology report recommended that there was one high significance item, the standing gas holder, and three items of low or medium archaeological significance, identified in the report as Elements 7, 8 and 9, and based in the western corner, near Burren Street.⁷

In a 2006 report by Heritage Concepts Pty Ltd, their list of recommendations for the site included the following measures:

It is recommended that a program of archival photographic recording is carried out for all items prior to the commencement of any remediation works. The archival recording should take place for all gasworks elements and any other items identified during the program of archaeological test excavation.

It is recommended that a program of archaeological monitoring is carried out during the remediation process in areas identified as having archaeological potential.

It is recommended that significant elements of the gasworks unearthed during the remediation and archaeological monitoring process are retained in situ if contamination levels allow.⁸

 ⁷ Banksia Heritage + Archaeology, April 2004, Macdonaldtown Station works archaeological assessment, draft, Section 4
⁸ Heritage Concepts Pty Ltd, Archaeological Assessment & Remediation Management Strategy for the former

⁸ Heritage Concepts Pty Ltd, Archaeological Assessment & Remediation Management Strategy for the former Macdonaldtown Gasworks, 2006, 27

4 RESEARCH DESIGN AND ARCHAEOLOGICAL PROGRAM

4.1 IDENTIFICATION OF RESEARCH THEMES / DESIGN

A research design is a set of research questions developed for a specific site, which will contribute to current and relevant knowledge. The research questions posed must be responsive to the nature of the archaeological evidence that is likely to be encountered. This research design details the appropriate methodology that will be undertaken so that the archaeological investigations reveal information not available from any other source.

The Macdonaldtown Gasworks site has been heritage listed at a State level as part of the Eveleigh Railway Workshops. The research themes relating to the site are not simply stand alone themes relevant to Gasworks but also themes inclusive of the larger railway operations.

Australian Theme	New South Wales Theme	Local Theme
3. Economy - Developing local, regional and national economies	Technology - Activities and processes associated with the knowledge or use of mechanical arts and applied sciences	(none) -
3. Economy - Developing local, regional and national economies	Transport - Activities associated with the moving of people and goods from one place to another, and systems for the provision of such movements	Engineering the public railway system -
5. Working - Working	Labour - Activities associated with work practises and organised and unorganised labour	(none) -
7. Governing - Governing	Defence - Activities associated with defending places from hostile takeover and occupation	Involvement with the Second World War -
7. Governing - Governing	Government and Administration - Activities associated with the governance of local areas, regions, the State and the nation, and the administration of public programs - includes both principled and corrupt activities.	Developing roles for government - building and administering rail networks -
7. Governing - Governing	Government and Administration - Activities associated with the governance of local areas, regions, the State and the nation, and the administration of public programs - includes both principled and corrupt activities.	Building and operating public infrastructure -

Themes relevant for the site include those listed on the SHR, as follows:

Banksia Heritage + Archaeology also noted the following Historical themes for the Gasworks:

State Theme	Local Theme	Demonstrators	
Agriculture	Land grants	Use of Burren grants for agriculture	
Law and Order	Newtown ejectment case	Involvement of the land as part of the infamous Newtown ejectment case.	
Technology	Gas works	Remains of gas holder and known use	
		of the site	
Transport	Rail yards	Use of the site to clean carriages and for gas works for rail gas supply	

It is the **Technology** and **Transport** themes that are seen as the most pertinent for this investigation. Archaeological remains belonging to the Gasworks phase would be regarded as having high significance because of their rarity, age and ability to answer research questions.

The potential for the study area to retain any evidence of Agriculture and Law and Order from the pre-1880s history of the site is extremely low, based on the historical evidence relating to the Railways and Gasworks uses of the site.

It must also be noted, that any potential for Aboriginal cultural heritage to remain on the site is also assessed as very low. This is, again, based on the Railways constructions on and around the site including the railway lines and the Gasworks processes.

This Research Design proposes a program of archaeological testing to record the nature and extent of the archaeological resource present at the site. The focus of the archaeological program will therefore be to investigate the areas of archaeological potential identified in the 2006 Heritage Concepts report. The focus of the investigation would be on areas of high and moderate archaeological potential. It is anticipated that the archaeological features and deposits will provide information about the past technologies and behaviours, economic and social conditions for the Gasworks and Railway workshops, for a continuous period from its initial construction in 1892 to its closure in 1958. All of which can contribute important evidence of the history and settlement of New South Wales and history of the working railways.

4.2 RESEARCH QUESTIONS

It is evident that remains still exist on the site but their extent and condition is not known at this stage. The program of test trenching is designed to be located to maximize the chances of picking up surviving structures like walls, footings, floor structures, or others.

Therefore, general research questions include:

- What is the condition and extent of the surviving archaeological evidence?
- What is the nature of the extant archaeological features; for example, is there evidence of the former activities, such as the purifying process? Can these elements be dated?

There is the potential for the known archaeological remains and remnant structures to be affected by a number of impacts. Not only by the excavations and soil cleaning and clearance planned as the remediation phase for the site, but also from the positions and movement of heavy machinery and vehicles during the processes. The remains will need to be identified and if necessary protected.

Site specific research questions for the Macdonaldtown Gasworks consist of the following:

- What is the extent and the condition of the below ground remains?
- Which elements would require removal due to the presence of significant contamination?

- Do the below ground remains contribute new information about the use and development of this Gasworks site?
- How do the remains of this site compare with the other Rail Gasworks sites identified in the history? That is, is this a representative site?
- What can it contribute for the relationship with the nearby Eveleigh railway sites?
- Is there evidence remaining of access and transport links to Eveleigh?
- What evidence remains for the processing on the site? For example, the retorts, or purifiers?
- What elements can be retained on site during / following the site remediation works?

Note: It has been assumed that we will not encounter a substantial amount of artefactual material that would warrant collection during the archaeological testing program, or that artefacts would be suitable for collection owing to the known high contamination risks of the soil on the site.

4.3 ARCHAEOLOGICAL METHODOLOGY

4.3.1 ON-SITE EXCAVATION METHODOLOGY

Preamble

Archaeological assessment may conclude that potential archaeological resources on a site are unclear. In such cases, test excavation may be recommended to clarify the potential of the site, to establish significance and to determine appropriate further action. In this context, test excavation can become part of a comprehensive archaeological assessment. Test excavation involves disturbance and excavation of relics and must be carried out in accordance with a research design and an excavation permit issued by the Heritage Council of New South Wales. The research design should explain the basis on which the testing will be undertaken. Test excavation can use traditional archaeological methods (small hand tools and hand excavation) or large-scale mechanical excavation. Test excavation is a preliminary phase that is likely to lead to recommendations for the following four courses of action: no further action; archaeological monitoring; archaeological excavation; or in situ conservation.

Test trench excavation

There are five areas identified in the report prepared by Heritage Concepts from 2006. The areas are shown in the Table overleaf. These areas are described as having various levels of archaeological potential; from no potential to high potential.

- No potential (Area Six) where there are either no remains expected or the remains are still exposed like the southern Gas-holder, therefore making testing unnecessary
- Low potential (Area Five)
- Moderate potential (Area Two)
- High potential (Area One, Three and Four).

The relics were numbered as Elements 1 to 11 in the Banksia report from 2004, with two additional elements (Elements 12 and 13) added in the Heritage Concepts report. The table below shows the abovementioned Areas, the expected archaeological potential and their relationship with the individual Elements.

Element	Area	Potential	Description
1	Six	Low	Southern Gas-holder (exposed)
2	One	High	Northern Gas-holder
3	Two	Moderate	Purifying Shed
4	Six	Low	Connection Shed
5	Four	High	Retort House
6			Cleaning Shed (located to the north of study area)
7	Six	Low	Retaining Wall (exposed
8	Six	Low	Structure (exposed)
9	Six	Low	Concrete Slab (exposed)
10	Six	Low	Cable Trenching
11	Six	Low	Retaining Wall
12	Three	High	Tar Tanks
13	Six	Low	Condensate Pit (exposed)
	Five	Low	Office and Tearooms, at northeast corner of Retort House (Element 5)

At this stage, the "Planning Phase" of the remediation project, we propose to dig a series of five (5) test trenches through the remnant fills.

The trenches will be up to 25m long and excavated to the required depth to determine if any sub surface remains of the structures demolished in the 1950s are still present.

- From the boundaries and the currently visible structures we will roughly mark out the footprints of the demolished buildings. The test trenches will then be located to maximize the chances of picking up surviving structures like walls, footings, floor structures, basements or others. There will be no trenches near the southern (standing) Gas-holder.
- The trenches will be excavated using a 7tonne excavator machine (or similar), with a 1.2 to 1.5m wide flat bucket. The machine excavation will be closely supervised at all times.

- The trenches will be cleaned by hand if necessary and any uncovered remains will be recorded to NSW Department of Planning Heritage Branch Standards, including scale plans, photographs and descriptive documentation.
- All other structures will also be recorded to Heritage Branch Standards.
- All / any artefacts recovered (depending on contamination) will be cleaned and catalogued. It is proposed to then provide them to RailCorp for future presentations.
- The trenches and the already exposed structures will be plotted, via a geodetic survey.
- After completing this recording the trenches will then be back filled and nominally compacted.

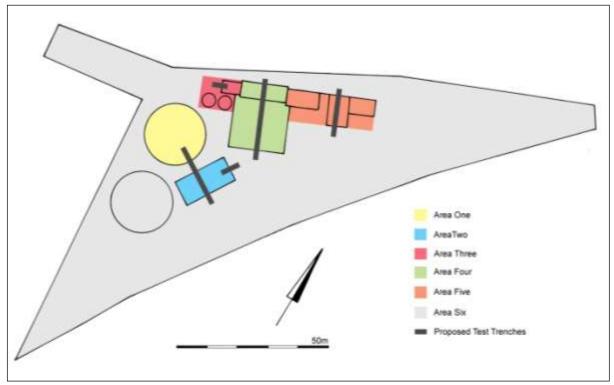


Figure 7: This Site Plan shows the areas allocated by Heritage Concepts in their 2006 report indicated in the colour coding for the rough location of the demolished structures. It also shows the proposed location of the test trenches for the 2010 program.

4.3.2 POST EXCAVATION

The post excavation documentation and analysis is explained in this section.

Post excavation schedule

- Complete database of contexts photographs and plans
- Excavation report
- Master report including recommendations for the second Phase, the "Remediation Phase"

• Finalisation and implementation of the Interpretation Plan

Heritage interpretation will form an important part of the ongoing conservation and management of the heritage significance of the Macdonaldtown Gasworks site. The Heritage Interpretation Strategy would form Stage 1 of a Heritage Interpretation Plan for the site. The findings of the test archaeological excavations are expected to provide a valuable contribution to the finalisation of the Interpretation Plan.

5 CONCLUSION

The proposed RailCorp remediation strategies for the Macdonaldown Gasworks site will impact on the potential archaeological resource. RailCorp have included provisions for investigation and management of the heritage of the site and the test program of archaeological excavations is proposed as part of that process.

- The site will be extensively disturbed by the remediation processes and therefore this opportunity will not present again.
- The program of test trenching will inform the remediation contractors as to where they can position their machinery and site sheds without damage to archaeological resources.
- The known history of the site can be further explained by this program of test trenching
- The relationship with Eveleigh Railway Works can be further established.
- Excavation of test trenches will permit identification and examination of any significant features or deposits within a controlled environment.

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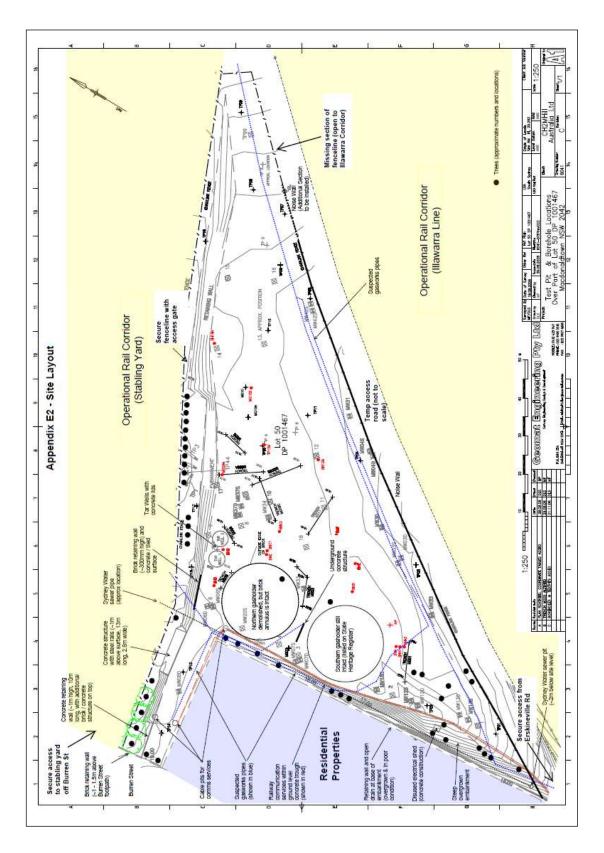
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6 APPENDIX ONE – EXCAVATION PERMIT APPLICATION

7 APPENDIX TWO - SITE PLAN



8 ATTACHMENTS: 2004 AND 2006 ARCHAEOLOGICAL ASSESSMENTS