NORTHCONNEX
REPORT ON ARCHAEOLOGICAL
TEST EXCAVATIONS —
THE MALTWORKS
1 PIONEER AVENUE, THORNLEIGH
NORTHCONNEX
REPORT ON ARCHAEOLOGICAL
TEST EXCAVATIONS —
THE MALTWORKS
1 PIONEER AVENUE, THORNLEIGH

REPORT BY JCIS CONSULTANTS

Prepared for — Lend Lease Bouygues Joint Venture (LLBJV)

JCIS Consultants Report: 14-027-6
LLBJV Document Number: ALL-LLB-01-0001-NN-RP-0001
DISTRIBUTION

Date: 27 July 2015

<table>
<thead>
<tr>
<th>Type</th>
<th>No.</th>
<th>Recipient</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRAFT</td>
<td>1</td>
<td>Mark Turner, Environment &amp; Approvals Manager, NorthConnex</td>
<td>13/07/2015</td>
</tr>
<tr>
<td>DRAFT</td>
<td>1</td>
<td>Jaclyn Ford, Environmental Advisor, NorthConnex</td>
<td>13/07/2015</td>
</tr>
<tr>
<td>FINAL</td>
<td>1</td>
<td>Grant Sainsbery, Environment &amp; Sustainability Manager, NorthConnex</td>
<td>27/07/2015</td>
</tr>
<tr>
<td>FINAL</td>
<td>1</td>
<td>Jaclyn Ford, Environmental Advisor, NorthConnex</td>
<td>27/07/2015</td>
</tr>
</tbody>
</table>

JCIS Consultants retains one copy of all its reports in our library and a PDF copy in our computer archives.

This document was prepared for the sole use of NorthConnex, Lend Lease Bouygues Joint Venture (LLBJV) and the regulatory agencies that are directly involved in this project, which are the only intended beneficiaries of our work. No other party should rely on the information contained in this report without the prior written consent of JCIS Consultants, NorthConnex and LLBJV.
CONTENTS

1 INTRODUCTION ................................................................. 1
  1.1 Background to this report ........................................... 1
  1.2 Study Area ............................................................... 3
  1.3 Heritage Listings ....................................................... 3
  1.4 Methodology ............................................................. 3
  1.5 Limitations ............................................................... 3
  1.6 Author Identification .................................................. 4
  1.7 Acknowledgements ..................................................... 4

2 HISTORICAL BACKGROUND .................................................. 5
  2.1 First Land Grant ......................................................... 5
  2.2 Orchardists .............................................................. 5
  2.3 The NSW Maltworks .................................................... 6
  2.4 A Family Enterprise ..................................................... 7
  2.5 Contextual Analysis: Historic Themes ............................... 8

3 PHYSICAL EVIDENCE .......................................................... 10

4 ASSESSMENT OF ARCHAEOLOGICAL POTENTIAL ....................... 11
  4.1 Archaeological Potential .............................................. 11
  4.1.1 Archaeological Research Potential ............................... 11
  4.2 Conclusion ............................................................... 13

5 ARCHAEOLOGICAL TESTING .................................................. 14
  5.1 Aims ................................................................. 14
  5.2 Excavation Strategy ................................................... 14
  5.3 Methods ............................................................... 14
  5.4 Results ............................................................... 15
  5.4.1 Trench 1 .......................................................... 15
  5.4.2 Trench 2 .......................................................... 15
  5.5 Discussion ............................................................. 16
  5.5.1 Evidence of the occupation of the Manager’s Residence by the Chilvers family ................................. 16
  5.5.2 Change in land use practices from rural to industrial in the early 20th Century ........................................... 16

6 REASSESSMENT OF THE ARCHAEOLOGY OF THE THORNLEIGH MALTWORKS ................................................. 17
  6.1 What are the likely remains of orchards? ............................... 17
  6.2 Surviving land surfaces from the pre-Maltworks Era ................... 18
  6.3 Reassessment of Archaeological Potential ................................ 18

7 CONCLUSIONS .................................................................... 19

8 BIBLIOGRAPHY .................................................................... 20

9 MAPS, PLANS AND IMAGES ................................................. 21
INTRODUCTION

NorthConnex will be a nine kilometre, tolled motorway link from the southern end of the M1 Pacific Motorway at Wahroonga to the Hills M2 Motorway at its existing Pennant Hills Road interchange in West Pennant Hills. NorthConnex will be the longest road tunnel project in Australia. Construction of the tunnel will begin in early 2015 and is expected to be completed in 2019.

As part of the planning for NorthConnex, an Environmental Impact Statement was prepared which included assessments of Indigenous and Non-Indigenous Heritage (AECOM 2014A and 2014B). The Environmental Impact Statement was publicly exhibited from 15 July 2014 to 12 September 2014 (a total of 60 days).

Approval for the construction and operation of NorthConnex was granted by the NSW Minister for Planning on 13 January 2015. The Conditions of Approval include new and extensive safeguards for the operation of the tunnel and air quality, and include conditions regarding the impact of the project on heritage.

1.1 Background to this report

As part of the NorthConnex project, the site of the former Maltworks in Thornleigh would be used during construction as the Pioneer Avenue Compound which would contain site offices and staff amenities, and would be primarily used as a car parking location for construction personnel. From the compound a shuttle bus would be used to transfer workers to and from construction sites throughout the construction footprint.

The former Maltworks operated from c1911 until the late 2000s and was first identified as being of Heritage Significance in 1993 when the site was recorded by Consultant Archaeological Services as part of the Hornsby Heritage Study (Perumal Murphy Wu 1993). Consultant Archaeological Services was part of the team headed by Perumal Murphy Wu to report on historical archaeology in Hornsby Shire.

The heritage listing identified the significance of the site as being an:

“Unusual industry which continues to use an older building layout and style though the present buildings date to the late 1960s. Important industry for the region and employer in the locality.”

(Consultant Archaeological Services; Study Inventory No: 077)

Although the listing report is very brief, the physical evidence noted — and historical themes clearly identify — that the site was listed for its industrial archaeology rather than the potential for archaeological deposits.

The former Maltworks was listed in the Hornsby Local Environmental Plan 1995 as Item No. A 66. The listing curtilage covers the whole site, namely Lot 12 DP 235680 and Lot 1 DP 542202.

The former Thornleigh Brickworks was identified as an item of Local Heritage Significance in the Environmental Impact Statement for the NorthConnex Project by the specialist consultants in heritage, AECOM, in their specialist report (which included an Appendix on the Thornleigh Maltworks). This work will be discussed in detail later in this report.
The recommendations of their assessment were adopted in the EIS as follows:

“The germination building at the Thornleigh Maltworks (A66) would be conserved. Prior to demolition of other structures:

- A structural assessment of the germination structure would be conducted to ascertain the possible impact of the demolition of adjacent structures and to identify suitable mitigation methods to ensure the germination structure remains intact. Additional measures would be identified and implemented, if required, to treat the newly exposed surfaces of the germination structure to protect it from the elements as a result of the demolition of adjacent structures.

- An archival recording of the industrial site would be undertaken to record the connection of the original structures to the modern upgraded structures.

- An archaeological test excavation program would be undertaken to assess the archaeological potential of identifying evidence of the early malting industry in this area, and the relationship of the industrial to the urban site and evidence of the occupation of the Manager’s house by the Chilvers family.”

(NorthConnex Environmental Impact Statement 2014: 918)

In turn, these recommendations were adopted in the Infrastructure Approval for the project where, under Condition A2, the recommendations for an archaeological test excavation in the EIS were adopted and in Condition D30 where, *inter alia*, it is required that:

“Where archaeological test excavations are carried out, in accordance with the documents listed in Condition A2, those investigations shall be undertaken in consultation with the relevant Council and OEH (Heritage Division), and shall:

a) be conducted in accordance with the Archaeological Assessments Guideline (Heritage Council, 1996) using a methodology prepared in consultation with the OEH (Heritage Division). The archaeological investigation shall be undertaken by an archaeological heritage consultant, a suitably qualified and experienced heritage expert with demonstrated ability to comply with the Criteria for the Assessment of Excavation Directors (Heritage Council July 2011);

b) provide for the detailed analysis of any heritage items discovered during the investigations;

c) include management options for these heritage items (including options for relocation and display); and

d) if the findings of the investigations are significant, provide for the preparation and implementation of a heritage interpretation plan.

Within 12 months of completing the above work, or as otherwise agreed by the Secretary, the Proponent shall prepare a report containing the findings of the excavations, including artefact analysis, and the identification of a final repository for finds, prepared in consultation with the OEH (Heritage Division) and to the satisfaction of the Secretary. The final approved report shall be submitted to the
This report, therefore, presents the results of the Archaeological Test Excavations at the former Maltworks, Thornleigh.

1.2 Study Area

The study area is the former Thornleigh Maltworks site at 1 Pioneer Avenue, Thornleigh and its cadastral address is Lot 12 DP 235680 and Lot 1 DP 542202.

1.3 Heritage Listings

The site is listed in the Hornsby Local Environmental Plan 2013 as item No. A 66.

Although the AECOM report identified that the site may have potential to contain archaeological remains, the project has been defined as State Significant Infrastructure and is, therefore, exempt from provisions of the *Heritage Act 1977* (NSW) covering “Relics” under the provisions of Section 5.1 of the Environment Protection and Assessment Act (1979).

1.4 Methodology

The methodology used in the preparation of this report is consistent with the guidelines of the Heritage Division of the Office of Environment and Heritage and the principles outlined in *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance*, 2013.

The terminology used in this report is consistent with the NSW Heritage Manual and the definitions contained in the *Burra Charter*.

The significance assessments in this report follow the practice guidelines *Assessing Significance* (Heritage Office 2001) and *Assessing significance for historical archaeological sites and ‘relics’* (Heritage Branch 2009).

The archaeological work was conducted according to the Historical Archaeology Code of Practice (Heritage Council 2009).

1.5 Limitations

This report is based on historical research and field inspections. It is possible that further historical research or the emergence of new historical sources may support different interpretations of the evidence in this report.

The maps in this report are for informational purposes only and are not suitable for and were not prepared for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.
The register searches undertaken for this report are current only to the date a particular register was searched. In the normal course of events, items are added to or removed from heritage registers and users of this report should check that sites have not been added to or removed from a particular register since the date the register was searched.

The Significance Assessment made in this report is a combination of both facts and interpretation of those facts in accordance with a standard set of assessment criteria. It is possible that another professional may interpret the historical facts and physical evidence in a different way.

This report is made on the basis of our experience of working with the NSW heritage system and does not purport to be legal advice. It should be noted that legislation, regulations and guidelines change over time and users of this report should satisfy themselves that the statutory requirements have not changed since the report was written.

1.6 Author Identification

This Report was prepared by Dr Iain Stuart of JCIS Consultants who was the nominated Excavation Director for the project.

Dr Stuart is highly experienced in the area of Historical and Industrial Archaeology and meets the requirements to be an Excavation Director for permits covering sites of State and Local levels of significance as set out in Criteria for the Assessment of Excavation Directors (Heritage Council July 2011).

Dr Stuart is one of Australia’s leading specialists in the area of Industrial Archaeology and Industrial Heritage. He is an elected board member of The International Conference on the Conservation of Industrial Heritage (TICCIH) and an advisor to Japanese Government on the World Heritage Nomination for sites of Japan’s Meji Industrial Revolution.

A copy of Dr Stuart’s resume demonstrating that he meets the Criteria for an Excavation Director was included as Appendix A to the Methodology for the Archaeological Test Excavations at the Former Maltworks (JCIS Consultants Report: 14-027-6, LLBJV Document Number: ALL-LLB-01-0001-NN-RP-0001).

1.7 Acknowledgements

- Grant Sainsbery, Environment & Sustainability Manager, NorthConnex LLBJV
- Jaclyn Ford, Environmental Advisor, LLBJV
- Luke Kirkwood, Principal Archaeologist, AECOM
- James Cole, Archaeologist, BIOSIS
2 HISTORICAL BACKGROUND

The site history has been updated to cover aspects of the site’s history prior to it being developed as a Maltworks.

2.1 First Land Grant

The study area was part of the larger property of John Milson Snr, an early and long-term post-contact settler of the North Shore. Milson did not receive a grant for this land; it is not clear why but, possibly, this was one of the many pieces of land that were promised but the deeds were never received. Milson died on 25 October 1872, survived by four sons and one of his two daughters (Macmillan 1967) who inherited his property.

Milson’s land had been surveyed in 1864 (C869 690) when it appears to have been largely uncleared. The study area was described as “fair land timbered with Iron Bark and oak”. This plan was used as the basis of a land grant to David Milson (one of John’s sons) on the 7th July 1879 (Vol 460 Fol 183).

David Milson had the land subdivided into two Sections with 20 lots (DP 484) and began selling these from 1880 (Vol 460 Fol 183). Agnes Duffy, the wife of Milson’s neighbour Patrick Michael Duffy, purchased Lots 2, 4 and 5 of Section 1 on the 21st September 1881. The Maltworks site (the study area) is located partly on Lot 5 and Lot 4.

2.2 Orchardists

The Duffy family, descendants of Patrick Duffy – a soldier who retired in Sydney and was granted land near the present study area – were orchardists. The land went to one of his sons, also Patrick who had married Agnes in 1854.

The land purchased by Agnes adjoined the family land but was later cut by the railway from Homebush to Newcastle which was surveyed in the early 1880s. The survey plan shows the present study area as being unoccupied (M445 3000). The Government formally resumed the rail corridor on the 9th October 1884 (Vol 716 Fol16).

Patrick Michael Duffy died in 1897 and, in September 1889, Agnes Duffy transferred three blocks of land to Daniel, John and Albert Duffy (Vol 716 Fol 74) respectively. John Duffy became the owner of Lot 5 which included part of the study area. Lot 5 was a lot of 14 acres running roughly west from Lymoore Avenue to Chilvers Road (Vol 552 Fol 89). Albert Duffy held Lot 4 which comprised 12 acres (Vol 980 Fol 53).

Albert Duffy’s orchard was described in an article of fruit growing at Thornleigh in the Australian Town and Country Journal (3 Feb 1900: 29). The article noted “in its original state the site of this orchard was heavily timbered with bluegum, blackbutt, ironbark, appletree, etc., in varying proportions”. The land had been cleared and stumped and, of the 12 acres, two and a half were planted with citrus trees, and the remainder with summer fruits.

John Duffy sold his property to Samuel and Emily Jane Cheetham (Samuel is described as a gardener from Leichardt). The land purchased by the Cheethams was, basically, everything west of the railway line and included the study area. The sale was finalised on the 17th October 1904. The Cheethams, in turn, sold the land to the NSW Malting
Company in October 1911 (Vol 1561 Fol 6). This gave the NSW Malting Company enough room to construct the Germination building but the land to the south remained in Albert Duffy’s hands.

Albert Duffy began selling parts of his land in the 1920s and, in November 1926, sold a triangular shaped parcel of land of approximately three acres to the NSW Malting Company. The transaction was registered in April 1927 (Vol 3989 Fol 26).

The land holdings of the NSW Malting Company were consolidated into a single holding in February 1928 (Vol 4114 Fol 205).

2.3 The NSW Maltworks

Malt is an important ingredient in the production of beer and related beverages, and is also used in baking, confectionery and condiments. It is made by the malting of cereal grain, typically barley (a variety of barley types were used) in a malt house or Maltings. The process involves cleaning and pre-treating the grain, allowing it to germinate and then drying it in a kiln (see Stopes 1885). The grain was then transported to a brewery for use in brewing.

In NSW, malt was imported from other states and overseas. Only two other Maltings in NSW have been identified – the Mittagong Maltings and one in Tamworth. Both were operating from 1900 but, by 1911, only the Mittagong plant was operating (Freestone 1991). The New South Wales Malting Company was formed in 1911 to tap into the market for malt by using NSW produced grain and supplying it to the brewing industry which was focused on Sydney (see Stubbs 2000).

“In September of 1911, the impetus to open a second malt house in New South Wales culminated in a proposal to construct a malting house on the Main Northern Line, between Sydney and Hornsby. In October of that same year, the New South Wales Malting Company (NSW Malting Co.) purchased 12 acres of orchard from a Mr Cheetham in Thornleigh (Anon 1911b) and, by November 1912, the construction of the Maltworks and an associated railway siding was well underway (Anon 1912) with the works being completed by July of 1913 (Anon 1913b). At that time, the NSW Malting Co. was identified as the only public malting company operating in New South Wales (Anon 1913a). The total costs of construction were estimated at around £15,000, and the new Maltworks were expected to produce between 90,000 and 100,000 bushels of malt per season, the equivalent of around one fifth of the amount of malt still being purchased from other states (Anon 1913c).” (AECOM 2014B:3).

“The Thornleigh Maltworks were officially opened on 29 August 1913 by the 19th Premier of New South Wales, the Honourable William Holman. During the ceremony, Premier Holman announced that he had accepted the invitation to attend the ‘interesting and novel’ occasion with pleasure, and that he considered the Maltworks to be a valuable industrial enterprise for the state of New South Wales (Anon 1913c). Among the large crowd of locals who attended the ceremony were representatives of the Tooheys Limited brewing company and the Department of Agriculture, as well as the renowned Sydney brewer A.W. Tooth, of Tooth and Company Limited.
The opening of the Thornleigh Maltworks represented a significant step forward in the industrialisation of the local area, as well as in the progression of the Australian malting industry” (AECOM 2014:3).

It is clear from the history of land ownership that the NSW Maltworks purchased the site in two phases and that the iron clad shed visible in the 1943 aerial image was constructed on land only owned by the Company in 1927.

“The Maltworks operated smoothly under the guidance of William George Chilvers, a highly experienced and renowned maltster who had gained experience malting both in England and Australia prior to accepting the position at Thornleigh. Following his death in 1937, Chilvers was succeeded by his son Hugh Cecil. The Chilvers family lived in a three bedroom house that was constructed in 1913 within 50 metres of the Maltworks. Throughout its years of operation, between 12 and 20 men were employed at the Maltworks at any one time (pers. comm., H. Chilvers to T. Kennedy).

Over time, the Maltworks established itself as an important feature of the local community and agriculture industry; in 1915 agricultural students from Granville and Sydney Technical Colleges visited in the orchards attached to the Maltworks for a lesson in pruning apple trees (Anon 1915), and from the 1910s to the 1940s both William and Hugh Chilvers acted as the lead judges of barley crops at the annual Sydney Royal Easter Show (numerous).

In 1966, the NSW Malting Co. sold the Thornleigh Maltworks to Barrett Bros. and Burston and Co. Pty. Ltd., an English malting company established in the 1860s. Following this change of hands, the Maltworks were subject to extensive remodelling and modernisation at a cost of around £2,356,000 (Anon 1968). Production recommenced under the new owners by the end of 1967 (Barrett Bros. and Burston Co. Pty. Ltd. 1972, 11), and continued up until the late 2000s when the site was closed.” (AECOM 2014B:3).

It was claimed that the investment by Barrett Bros. and Burston and Co, in 1967, was the last major investment by that company in maltworks in NSW. The Mittagong Maltworks closed in 1981 following several fires and mergers in the brewing industry (Freestone 1991:154). The Victorian company, Joe White Maltings, established a plant in Tamworth in 1967 and, with the closure of the Mittagong Maltings, the Thornleigh plant was one of two operating in NSW until the opening of Joe White Maltings’s plant in Minto.

2.4 A Family Enterprise

The Chilvers family have significant connections with the early Australian malting industry, as well as with the Hornsby Shire local area. William George Chilvers was born in Hunslet, Leeds, on 19 September 1872 to George Chilvers (also a Maltster) and his wife, Rose Ellen Mole. Prior to migrating to Australia, William Chilvers worked for the English malting firm of William Jones and Sons Ltd, where he was responsible for overseeing the operation of over 30 large maltings (Anon 1904b). When Jones and Sons Ltd. purchased the maltings in Toowoomba, Queensland, they invited Chilvers to relocate to Australia and oversee operations (Anon 1904b). At the time, Chilvers was considered to be a leader in his field; and had been described as ‘practically the best Maltster obtainable in England to-day’ (Anon 1904a).
Chilvers worked at the Toowoomba Maltings until he relocated to Sydney in 1912 to oversee the construction and manage the operation of the Thornleigh Maltworks. He brought with him his wife, Alice Maud Shellard, and their seven children; Birdie Violet, Iris Constance, Audrey Lillian, Hugh Cecil, Millicent Grace, Arthur Herbert and Douglas Algenon (Anon 2014b). The family lived in a three bedroom home located within 50 metres of, and constructed at the same time as, the original Maltworks buildings.

William Chilvers passed away on 1 September 1937, at which time his son Hugh Cecil Chilvers, took over management of the Maltworks. Hugh had been his father’s understudy for many years previously and represented the fifth generation of Chilvers to take up the role of maltster (pers. comm., H. Chilvers to T. Kennedy). Following the sale of the Maltworks to Barrett Bros. and Burston and Co. Pty. Ltd in 1966, Hugh retired as manager but stayed on for a further 10 years as Plant Manager under the new owners.

Both William and Hugh were notable local personalities within the Hornsby Shire area; from the 1910s through to the 1930s both father and son were invited to act as expert judges of barley crops at the annual Sydney Royal Easter Show, and the Chilvers family regularly appeared in local newspapers (Anon 1916).

2.5 Contextual Analysis: Historic Themes

Contextual analysis is undertaken to place the history of a particular site within relevant historical contexts in order to gauge how typical or unique the history of a particular site actually is.

This is usually ascertained by gaining an understanding of the history of a site in relation to the broad historical themes characterising Australia at the time. Such themes have been established by the Australian Heritage Commission and the NSW Heritage Office and are outlined in synoptic form in New South Wales Historical Themes, issued by the NSW Heritage Office (2001).

Although the AECOM assessments did not consider the Historic Themes, the earlier assessment by Consultant Archaeological Services did consider that the works fell into the themes of “Agricultural diversification, Industrialisation”.

After considering the history of the study area, two relevant historical themes have been identified. This is presented in Table 2.1 below:

<table>
<thead>
<tr>
<th>Australian Theme</th>
<th>NSW Theme</th>
<th>Notes</th>
<th>Examples of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Developing local, regional and national economies</td>
<td>Agriculture</td>
<td>Activities relating to the cultivation and rearing of plant and animal species, usually for commercial purposes; can include aquaculture.</td>
<td>Hay barn, wheat harvester, silo, dairy, rural landscape, plantation, vineyard, farmstead, shelterbelt, silage pit, fencing, plough markings, shed, fish farm, orchard, market garden, piggery, common, irrigation ditch, Aboriginal seasonal picking camp.</td>
</tr>
</tbody>
</table>
The theme of Agriculture relates to the site in two ways; firstly, because of its prior use as an orchard (an activity typical in the Hornsby Shire) and, secondly, because the Maltworks provided a market for growers of barley. Indeed, newspaper reports at the time mention that the NSW Malting Co provides “special” barley seed to farmers – presumably to encourage the growth of the quality of barley required for malting.

The theme of Industry relates to the creation of the site in Thornleigh, strategically located by the Main Northern Railway line, and the development of the plant. The same technology essentially continued being used at the Maltworks until its sale by the NSW Malting Co in 1966 (at that time the plant appears to have been using the same technology as when it started). However, in 1967, the plant was completely overhauled and modernised – inside and out – with new buildings and plant and the conversion of the older buildings to house new equipment.

<table>
<thead>
<tr>
<th>Australian Theme</th>
<th>NSW Theme</th>
<th>Notes</th>
<th>Examples of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Developing local, regional and national economies</td>
<td>Industry</td>
<td>Activities associated with the manufacture, production and distribution of goods.</td>
<td>Factory, workshop, depot, industrial machinery, timber mill, quarry, private railway or wharf, shipbuilding yard, slipway, blacksmithy, cannery, foundry, klin, smelter, tannery, brewery, factory office, company records.</td>
</tr>
</tbody>
</table>
3 PHYSICAL EVIDENCE

As part of their assessment of it, AECOM inspected the site in 2014. In their report on this inspection they note in regard to potential archaeological deposits:

“The field inspection also assessed the immediate surrounding area of the main malting complex and the Manager’s House for archaeological remains. It was observed in this area that the ground surface integrity was high with no evidence to indicate that substantial groundwork had taken place in those places. Ground surface visibility ranged from near 100 per cent to low in part due to the presence of grasses and ground litter from trees. All areas of ground surface visibility were inspected. No evidence of archaeological features was identified.”

(AECOM 2014B)

It is clear from their assessment and their subsequent reports that AECOM believed that there was a need to assess whether the site had potential to contain archaeological deposits from the historic period.

GHD Pty Ltd (GHD) was commissioned by Roads and Maritime Services (RMS) to conduct a Contamination Investigation (the assessment) at the Maltworks in 2014. AECOM was appointed to monitor geotechnical testing within the site’s curtilage. AECOM applied for and obtained a Section 139(4) Exemption from the NSW Heritage Division.

AECOM monitored 35 geotechnical boreholes. Evidence of a sub-surface concrete slab, which possibly related to the earlier storage complex, was found in BH 24. Cinder slag material and “a buried former ground surface layer” were also found. None of these finds were considered to be substantially intact relics of State or Local Significance.

The results of the monitoring did not alter AECOM’s original recommendations for a test excavation program (AECOM 2014C).

The AECOM report did, however, expand on the potential historical archaeology to consider “pre-industrial Agricultural Landscape” and identified a possible “buried former ground surface layer” (see above) which represents “early agricultural activities” (presumably they meant the orchards that were on the site prior to the establishment of the Maltworks) and provides evidence of a “change in land use practices from rural to industrial in the early 20th Century” (AECOM 2014C:8).

Dr Iain Stuart, from JCIS Consultants, inspected the site on the 25th March 2015 to verify site conditions. Much of the site has been heavily altered by the construction of level surfaces for the Maltworks and associated roads and the railway siding. The area of least disturbance is adjacent to the Manager’s Residence which seems to be borne out by the essentially “natural” soil profile recorded from Borehole 21 to the north west of the Residence.
4 ASSESSMENT OF ARCHAEOLOGICAL POTENTIAL

This section reviews the Archaeological Potential and the Archaeological Research Potential of the Maltworks with the aim of identifying a clear research aim and focus for the proposed archaeological testing which would then determine the methods to be used.

4.1 Archaeological Potential

Archaeological Potential is defined by the NSW Heritage Division’s Archaeological Assessment Guidelines as ‘the degree of physical evidence present on an archaeological site’. This assessment asks the question "what is likely to be there?"

Archaeological potential can be subdivided into the following categories, based on the likely occurrence of archaeological material:

- **High Potential**: Areas with known archaeological remains
- **Medium Potential**: Areas that may have archaeological remains based on other lines of evidence such as maps or documents
- **Low Potential**: Areas that are likely to have minimal archaeological remains based on analysis of known or likely disturbance
- **No Potential**: Areas where it is known that archaeological remains will not occur

AECOM have identified two areas of archaeological potential (2014C: Figure 1); one surrounding the Manager’s Residence and the other around the Germination Building.

Based on our review of the relevant information, JCIS Consultants concurs with this identification.

However, we note that the construction of the new grain storage area and the concrete storage silos in 1967 involved the excavation of large flat areas, thus effectively removing evidence of earlier land use and buildings. This impression is supported by the results of the GHD contamination testing.

The “concrete slab” reported to be discovered in BH 24 is considered by AECOM to be part of the earlier grain storage area but they made no further recommendations for archaeological work to uncover the slab.

It should be clear that archaeological potential attempts to assess whether there is the potential for archaeological remains to occur in an area but not (at this stage) how important these remains might be if they existed.

4.1.1 Archaeological Research Potential

“Archaeological research potential is the ability of archaeological evidence, through analysis and interpretation, to provide information about a site that could not be derived from any other source and which contributes to the archaeological significance of that site and its ‘relics’” (Heritage Branch, Department of Planning 2009:11).
Archaeological Research Potential attempts to consider the importance of archaeological remains.

It should be noted that not all archaeological remains are of equal importance.

This discussion also considers how the potential of an archaeological resource can actually contribute knowledge rather than its potential contribution to knowledge. That is, while a site may have potential, are there actual proven archaeological methods that can be used to realise that potential? Archaeologists often make claims about the ability of particular sites to answer questions while failing to understand the limitations of archaeological methodologies.

AECOM has identified several questions which archaeological remains might address:

- identifying evidence of the early malting industry in this area;
- the relationship of the industrial to the urban site;
- evidence of the occupation of the Manager’s house by the Chilvers family (2014A, 2014B); and
- change in land use practices from rural to industrial in the early 20th Century (2014C).

These research questions are discussed below.

**Identifying evidence of the early malting industry in this area** —

This question is a bit muddled as there was no earlier malting industry at Thornleigh prior to 1912 and the buildings from this period are substantially intact – although altered. Photographs of the site over time reveal that other remains, such as the original storage sheds, have been demolished and then built over leaving only a possible trace in the form of (say) a concrete slab.

Assuming that by the “early malting industry” AECOM was referring to the first phase of malting works on the site, possible subsurface remains are likely to have little or no potential to add value to our understanding of the history of the site and how it worked.

Industrial archaeology on the Maltworks plant (washing, germination and kiln areas) has considerable potential to document the early industrial processed but this work does not require any form of excavation.

The concrete slab is interesting in this context; nevertheless, it simply formed a surface for storing grain and thus, if the slab was excavated, it would contribute little to the history and archaeology of the site because it was a minor part of the production process. Therefore, while the slab demonstrates the location of the grain storage area this is also known from other sources. As such, the concrete slab has low research potential.

**The relationship of the industrial to the urban site** —

This question is supposed to relate to the relationship of the original industrial site (the germination building) with the urban site (Manager’s Residence). It is not clear how this relationship – which is expressed in distance, landscaping and in building style – can be investigated by archaeological excavations. Archaeological
investigations would merely duplicate information which is readily available from historic aerial images and existing site plans.

**Evidence of the occupation of the Manager’s house by the Chilvers family —**

The Chilvers family occupied the Manager’s Residence for some 60 years and the family were significant in the community. Whether there is a significant archaeological deposit associated with their occupation of the Manager’s Residence is unclear.

Generally, archaeologists would consider questions of rubbish removal, as in this period of time rubbish was removed off site. In addition, the Manager’s Residence appears to have internal sewerage, meaning that there were no cesspits or privy pits on site that could be filled with household rubbish. Nevertheless, there may be some potential for deposits around the house that could provide evidence of the Chilvers family’s occupation of the site.

Such remains would be unlikely to answer research questions but would help illustrate the Chilvers family’s life on the site.

**Change in land use practices from rural to industrial in the early 20th Century —**

The identification of intact soil profiles during the archaeological monitoring resulted in this research question being developed. Certainly the Maltworks were constructed on the site of Mr Cheetham’s orchard so there is the potential for evidence of orcharding to be found in buried land surfaces but it is not clear how important this evidence might be.

It should be noted that the transition from orchards to industrial use is not an issue that is highly significant to the history of NSW nor is it one that archaeological testing would be well equipped to define. It is not clear what archaeological remains would be expected to demonstrate the transition; possibly remains from trees or macro floral remains.

It is also possible that more detailed information on the transition and the nature of orcharding in Thornleigh could be obtained from other sources such as the Digitised Australian Newspapers, maps and plans and other historic records such as diaries and photographs.

### 4.2 Conclusion

To conclude, the area surrounding the Manager’s Residence has limited archaeological research potential to address questions related to:

- Evidence of the occupation of the Manager’s house by the Chilvers family, and
- Change in land use practices from rural to industrial in the early 20th Century.

This area has the most archaeological potential and, as the aim for the test excavations is to test to see if that area has archaeological deposits and what their significance might be, it is this area that would be suitable for the archaeological test program.
5  ARCHAEOLOGICAL TESTING

A research design for the archaeological was developed by JCIS Consultants based on the AECOM Assessment (Stuart 2015). The assessment was reviewed by the Department of Planning and by the Heritage Division, Office of Environment and Heritage and approved.

The fieldwork occurred on the 14th May 2015 and was conducted by Dr Iain Stuart, Excavation Director, and James Cole, Archaeologist.

5.1  Aims

The project aim was to undertake an archaeological test excavation program to assess the archaeological potential of the area surrounding the Manager’s Residence to contain archaeological deposits that can answer questions relating to:

- Evidence of the occupation of the Manager’s Residence by the Chilvers family; and
- Change in land use practices from rural to industrial in the early 20th Century.

5.2  Excavation Strategy

In order to achieve the above aim it was decided that best archaeological practice would be to open single areas of approximately 2m by 2m for testing, rather than a series of smaller pits, as a larger contiguous area would have a better chance of finding evidence of orcharding than small pits.

Subsequently, two excavations of 2m by 2m located on the north western side of the Managers House (Trench 1) and the North Eastern side (Trench 2) were undertaken. The location of the trenches is shown in Figure 2.

5.3  Methods

The work steps were to be as follows:

1)  Mow the area and clear off grass.
2)  Set out work area (including access points, stockpile locations and safety barriers, etc.).
3)  Record levels across the site using either a GPS or level.
4)  Use an excavator, backhoe or Non-Destructive Digging (NDD) to remove the surface layer of grass (any excavator or backhoe employed would have to use a smooth edged mud bucket).
5)  Continue mechanical excavation until cultural deposits are located or until the Excavation Director considers that the excavation has reached sterile ground.
6)  If evidence of buildings and/or structures is located, this would be exposed using a combination of mechanical and hand excavation. Where appropriate (in cases where in situ cultural deposits are located) some deposits would be sieved to retrieve artefacts and/or macro floral evidence.
7) At the conclusion of the excavation the test excavation would be backfilled.

In the field it was determined that it was unnecessary to mow the area so this work step was not undertaken. Otherwise the work proceeded as outlined above.

Due to concerns about underground services, Non-Destructive Digging around the axis of the trenches was used to ensure that the excavation would not accidently contact underground services.

5.4 Results

5.4.1 Trench 1

Trench 1 was excavated in the side garden on a moderate slope to the north west of 11%. The trench proved to be 2.96m by 2.31m and was 7.01m². The trench was excavated to a depth of approximately 61cm.

The upper layer was an organically rich silty clay, very dark Grayish Brown in colour (Munsell 10YR 3/2) and was 30-40cm thick. There was an indistinct transition to the underlying layer of a Reddish Brown (Munsell 5YR 4/3) stiff clay which appeared to get redder at depth.

Underlying the clay was a mottled clay of light Reddish Brown (Munsell 5YR 6/4) with Yellowish Red Mottles, (Munsell 5YR 4/6 about 2cm). There was an indistinct transition from the upper layer to this layer.

As the soil profile was fairly typical of that found within the Glenorie soil landscape and there was no evidence of orcharding or other impacts, this excavation ceased and after recording was backfilled.

5.4.2 Trench 2

Trench 2 was located in the front garden opposite the front elevation of the Managers House. The ground had a moderate slope of 85% to the north-west. The trench as excavated was 2.5m by 2m with an area of 5.09m². The trench was excavated to an approximate depth of 40cm.

The upper layer was an organically rich silty clay very dark Grayish Brown in colour (Munsell 10YR 3/2) and 50cm thick. There was an irregular and diffuse boundary to an underlying layer of a Reddish Brown (Munsell 5YR 4/3) stiff clay which appeared to get redder at depth.

Cut into this layer was a post hole which was visible because it was backfilled with material from the upper layer. The post hole was oval in shape, 30cm at its longest axis and 20cm wide. The post hole was cut 15cm into the lower layer of Reddish clay (RL 175.63 MSL).

There being no other evidence of cultural features and the soil profile being essentially a natural transition typical of that found within the Glenorie soil landscape, the excavation ceased and after recording was backfilled.
5.5 Discussion

Two research questions were established in the archaeological assessment namely:

• Evidence of the occupation of the Manager’s Residence by the Chilvers family; and

• Change in land use practices from rural to industrial in the early 20th Century.

5.5.1 Evidence of the occupation of the Manager’s Residence by the Chilvers family

The absence of artefacts suggests that the Chilvers family disposed of their rubbish off-site – probably through the Hornsby Shire garbage removal system.

5.5.2 Change in land use practices from rural to industrial in the early 20th Century

Overall the results of the test excavation revealed a fairly typical, uniform and consistent soil profile with no indication of human modification of the landscape in this location. The results are generally consistent with the stratigraphy reported in the GHD contamination report.

The discovery of an isolated post hole is, in itself, not an indication of orcharding as it could have been related to any number of rural or domestic activities.
6 REASSESSMENT OF THE ARCHAEOLOGY OF THE THORNLEIGH MALTWORKS

At the conclusion of the archaeological testing it is relevant to ask: “what are the implications of the results for the overall archaeological potential of the site”?

6.1 What are the likely remains of orchards?

Further historical research into the land ownership and orcharding on the site identified a number of practices that occurred during the use of land as an orchard.

Fortunately there is an account of Albert Duffy’s orchard from 1900 which described his property; and it is reasonable to assume that his brother would have used much the same methods (see Australian Town and Country Journal 3 Feb 1900: 29).

Table 6.1: Activities relevant to orcharding on Albert Duffy’s land

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearing</td>
<td>Clearing and stumping the whole property – presumably the Blue Gum High Forest. The larger stumps would have been burnt “in situ”; other timber would have been sold where possible and the remainder burnt.</td>
</tr>
<tr>
<td>Draining</td>
<td>A common theme was the need to drain the land, particularly for citrus trees. Two acres were drained “with earthenware pipes, having a diameter of 1½in. These are laid 2ft 6in deep, and the fall is sufficient to ensure the superfluous water being carried off rapidly. The main drains are open ones, so that it is easily ascertained when everything is acting satisfactorily”.</td>
</tr>
<tr>
<td>Tree planting</td>
<td>“The citrus trees are planted on the quincunx principle, in rows 17ft apart, and the summer fruits on the square in rows 16ft 6in apart, and the trees the same distance apart in the rows”.</td>
</tr>
<tr>
<td>Pruning and cultivation</td>
<td>The trees were pruned to promote vigorous growth. “The winter cultivation of the citrus trees consists of spading or digging the soil with a fork-hoe. In the spring the land is harrowed, and during the summer months it is frequently worked with the Planet Junior [a wheeled hoe], or hoed by hand. The cultivation of the summer fruit trees consists of roughly breaking up the soil with the plough or hoe in the late autumn or early winter months, and frequently working it during the summer season.”</td>
</tr>
<tr>
<td>Soil conditioning</td>
<td>“The citrus trees are mulched with blady grass, which is said to be highly suitable for this purpose. The orange trees are manured annually (in the autumn time) with green bone dust, at the rate of five bags (10cwt.) to the acre. This is spread evenly over the surface, and lightly worked into the soil. The lemon trees are manured with dried blood and bonedust at the rate of 16cwt per acre, half of which is applied early in spring, and the remainder early in autumn”</td>
</tr>
<tr>
<td>Tracks and other roads</td>
<td>These are not mentioned but would have existed to allow cutting of the fruit and maintenance of trees. Presumably these ran uphill to Duffys Lane.</td>
</tr>
<tr>
<td>Buildings and structures</td>
<td>Again, these are not mentioned but would have been located on the main transport nodes to allow transport of fruit to Thornleigh Railway Station. It is also presumed that there would have been some sort of packing shed.</td>
</tr>
</tbody>
</table>

Archaeological remains are likely to be in the form of evidence of trees, either burnt stumps of native species or the remains of planted species (which would be organised in...
rows). Associated with these would be possible evidence of soil improvement or cultivation although the passage of time (over 100 years) might have removed evidence of soil improvement in the soil profile.

Certainly, there may well be evidence of drainage in the form of earthenware pipes as it seems unlikely these would have been removed when the orchard ceased production.

Farm tracks would probably have been obliterated by later development.

Buildings and other structures are likely to have been located near Duffys Lane to facilitate loading of produce to market.

The archaeological testing produced no evidence of either trees or earthenware pipes, suggesting that this form of evidence may not have survived in the archaeological record of the site.

6.2 Surviving land surfaces from the pre-Maltworks Era

It is worth considering what impact the Maltworks had on the land surface formerly used for orcharding and on archaeological remains of the orchard.

Based on a detailed site inspection undertaken as part of the archival recording, it seems that the mid-1960s upgrading of the site resulted in considerable excavation and building up of the land surface leaving the area surrounding the Manager’s Residence as the only area that contains remains of the original land surface.

This reassessment confirms that the area around the Manager’s Residence has the greatest chance to contain archaeological remains from orcharding and the Chilvers family as it is the most undisturbed area on site.

There was some suggestion in the AECOM assessment that there may be remains of the iron clad building seen in the 1943 aerial image and under the mid-1960’s construction. However, a site plan showing the buildings (DP 230112), which was surveyed in 1966, has been overlaid on a more recent aerial image. It is clear from this that a substantial amount of the building would have been removed when the Barley Store was constructed along with potential damage to footing remains from construction of concrete slabs for the rail tracks and other buildings.

6.3 Reassessment of Archaeological Potential

Based on the result of the archaeological testing it is concluded that the archaeological potential of the Maltworks should be assessed as “low” over the areas around the Manager’s Residence and adjacent to the Germination Building. The remaining area has “No” archaeological potential as the mid-1960s construction work would have removed much of the original land surface.
7 CONCLUSIONS

In conclusion, JCIS Consultants, on behalf of LLBJV and the NorthConnex project, has undertaken the test excavation at the Maltworks site recommended in the Environmental Impact Assessment for the project in accordance with the approved Research Design.

The results were that no significant archaeological remains were located nor were any relics recovered.

Based on these results it is noted that:

1. There was no requirement for detailed analysis of any heritage items discovered during the investigations as none were discovered.
2. Management options for heritage items discovered during the investigations were not required as no heritage items were discovered.
3. As the findings of the investigation were not significant, the preparation and implementation of a Heritage Interpretation Plan was not required.

Therefore, with the submission of this report Condition D30 of the Conditions of Approval has been completed in so far as it relates to archaeological test excavations.
8 BIBLIOGRAPHY


Minister for Planning 2015, 'Infrastructure approval Section 1152; 8 of the Environmental Planning & Assessment Act 1979', Vol. SSI-6136.

NSW Heritage Branch Department of Planning and Heritage Council of New South Wales 2009, Assessing significance for historical archaeological sites and 'relics'. Parramatta, Heritage Branch, NSW Dept. of Planning.


Stuart, IM 2015, Methodology for the Archaeological Test Excavations at the Former Maltworks, 1 Pioneer Avenue, Thornleigh, NSW, Report by JCIS Consultants for NorthConnex — Lend Lease Bouyges Joint Venture (LLBJV).
9 MAPS, PLANS AND IMAGES

Figure 1: General location of the Thornleigh Maltworks

Figure 2: Location of the Test Trenches and surface levels
Figure 3: Location of the Test Trenches and levels after excavation

Figure 4: Trench 1 after excavation, looking south-east
Figure 5: Trench 2, looking north-west, after excavation (the post hole can be seen to the left of centre)

Figure 6: Trench 2, looking south-west, at the post hole after excavation