



Heritage Aspects of the Powerhouse Museum Precinct

Some notes motivated by the planned
destruction of these buildings.

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The cover illustration is based on a picture of the Ultimo Power House in its industrial heyday, about 1940.

About this book

Please see www.lockoweb.com/phm for the sources for this material: they could not be fitted in this small publication.

I believe all pictures used are in the public domain; most of the modern ones were taken by me. If I have used a picture of yours, and you object to its use, please let me know at tomlockley@gmail.com and I will withdraw the picture and publicise my apologies for the error.

As mentioned in the introduction, I have no specialist training in relevant fields. The booklet has been made possible because of invaluable help given by Marion Barker, Domino Risch, Nicholas Childs – and several other remarkable people who have preferred to remain anonymous! Jamie Parker, MP has also given valuable encouragement and support. No paid employees of MAAS have been involved.

Since its first printing, my friends and I have been heartened by the support of many people who have read this booklet. The announcement made by Mr Baird on 11 April 2014 confirms the building of the new museum at Parramatta, and this is to be applauded. However the idea of demolishing the buildings of the Powerhouse precinct needs careful examination. While I have endeavoured to be dispassionate in this discussion, it is apparent that the destruction of these buildings will be an act of gross vandalism. If matters of heritage and history have any value at all, the economics of this action are certainly dubious.

The website <http://powerhousemuseumalliance.com/> is sponsored by people seeking to have a better outcome both for Parramatta and the Powerhouse Museum, and this deserves support.

Thank you for reading this booklet. Please feel free to send comments, corrections and criticisms to tomlockley@gmail.com and I will incorporate relevant material as soon as practicable.

Tom Lockley

Heritage Aspects of the Powerhouse Museum Precinct

(These buildings are scheduled for destruction to clear the site to be sold for new development. This will finance the relocation of the museum to Parramatta).

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Third printing, made following the announcement of the site for the new museum in Parramatta..
11 May 2016.

currently estimated at \$2.2 billion dollars, with a build time of five to six years.

There were earlier electricity producers in NSW, but the existing Ultimo buildings can claim to be the relics of the oldest surviving large power station.

It was realized at the outset that quick expansion would be needed, both in terms of the numbers of power stations and their power. The demand for electricity grew almost exponentially. A 1906 report claimed that 46 power stations generated 23 000 kw for general use and another 13 000 kw was being generated for traction purposes.

At Ultimo by 1902 the original station was enlarged by extending the engine room and the boiler room, and three new engines driving new generators made it the largest generating power station in the Southern Hemisphere. Two more similar engine/generator plants were installed in 1909. This growth within Ultimo continued until 1942.

Though the original design allowed for considerable expansion there was soon urgent need for even more power. The hugely bigger White Bay power station, 5 km away, was inaugurated in 1917 and was continually expanded until well into the 1950s. By then, the high tension grid enabled efficient power transmission from huge stations erected near coal supplies and hydroelectric power stations were being developed. The whole electrification process was a magnificent achievement for our young country.

‘If we don’t have a past, we don’t have a future’.

If we destroy something unique in the process of creating yet another luxury residential tower or internationalised shopping centre, we are ignoring the long-term economic and social benefits of our heritage. More importantly, if we do not preserve and publicise the remarkable achievements represented by our heritage we have failed those who came before us, and what is worse, we have failed the generations to come.

been planned, the rise in the generating capacity from 800 to 850 kw and rain which damaged the generators which had to be installed before the roof was completed.

A Heritage Council report in 1983 noted 'the fabric of the Ultimo Power House embodies the spectacular growth of electric power in Sydney and the technological changes that accompanied that growth. The Power House housed the most important innovations in steam-electric generation from the late 19th Century to the mid 20th Century. At the time of the completion of the first expansion phase, Ultimo was the largest and most powerful electricity generating unit in the Southern Hemisphere. The overhead travelling cranes when installed were the most modern of their type in the world and are now rare. The Power House was built to supply electricity for the first major tramway in Australia and for the conversion of other tramways to electric traction. The tramway network revolutionised commuting in early 20th century Sydney and/ played a significant role in the growth of suburban Sydney.'

What did it cost? On September 6 1896 the 'George and Harris Tramway Act' was passed. £130 500 was allocated to the Public Works Department. to build a line and power station. In November the same year £150 000 was allocated to the railways commission to convert all existing small tramways to electric power. There was about a 10% cost overrun, but even including this, the cost of the project was considerably less than £400 000, including buildings, generating equipment, tracks and wires and trams.

Wages were low, and methods were labour intensive. The work was being done on virgin ground, with none of the complex subterranean infrastructure that bedevils all modern construction. Thus it is not easy to compare this budget with modern conditions. Perhaps a valid comparison may be based on house prices: a reasonable house could be bought in 1898 for about £400. A typical Sydney house now costs \$1 million. £400 000 would buy 1000 houses, thus the cost may be said to be equivalent to about \$1 billion in current money. Cost of the present Circular Quay to Randwick light rail construction is

Introduction

The New South Wales government has decreed that the Power House Museum at Ultimo, key site of the Museum of Applied Arts and Sciences, is to be moved to Parramatta. Dr Geoff Lee, Parliamentary Secretary, on 26 February, 2015 forcefully reiterated this policy in a speech in the Legislative Assembly. This included a statement that money from the sale of the sale of the Ultimo site will be used to build the new Powerhouse at Parramatta.

Debate rages about the logistics, demography and economics of the move of the museum to Parramatta. But in this debate, there seems to have been little attention to the heritage value of the existing Ultimo buildings and the purpose of this little booklet is to address this imbalance of information. Everyone must be aware of the serious decision that appears to have been made regarding the fate of the buildings themselves.

The planned demolition is a major factor in the economics of the move. However, heritage factors must be taken into full account. For example, the museum has great economic value for tourism: many people visit a country to understand its unique cultural heritage rather than to see glitzy residential towers, casinos and shopping centres that are much the same all over the world.

The writer is not a professional architect or an engineer, but one passionate about Australian history and the need to emphasise past feats as an encouragement to future endeavours. Every effort has been made to ensure that the facts are as stated, and the material upon which this booklet is based is listed at lockoweb.com/phm/index.htm

The purpose of this booklet is succinctly to present the basic heritage aspects of the Powerhouse buildings so as to remind all concerned of their existence, relevance and also their economic value at this site.

Entry: The Goods Line

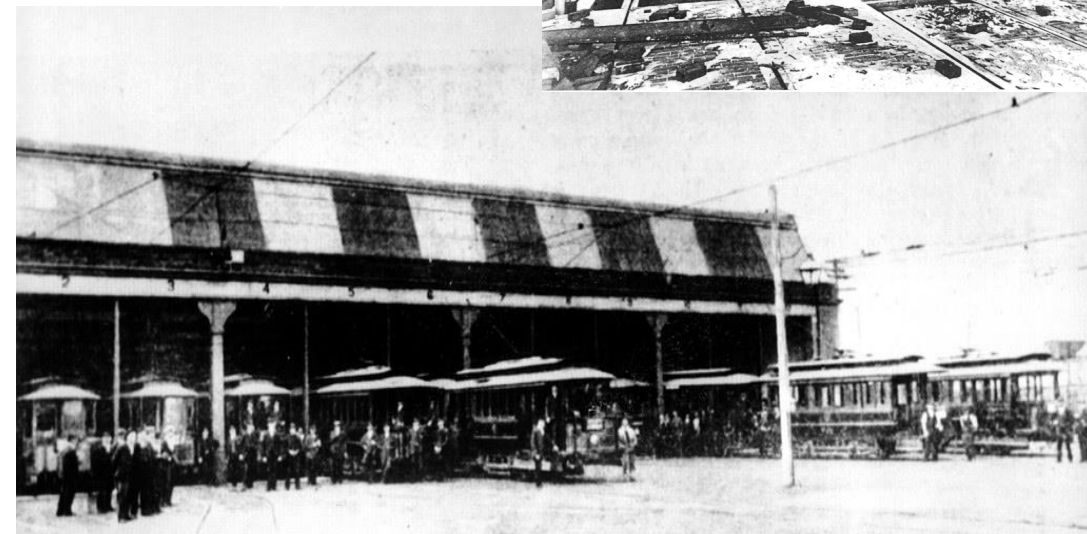
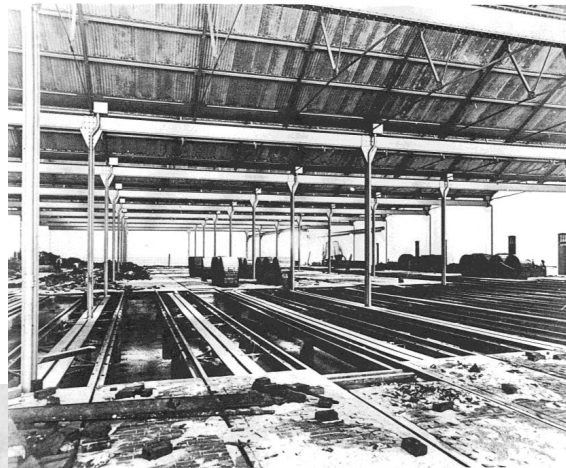


Darling Harbour is being rebuilt as a state-of-the-art 2016 development along the lines of this illustration of a 35-storey hotel being built by Lend-Lease.

In 2014 the construction of 'Sydney's version of New York's High Line' was announced. It follows the route of the old goods railway and brings people from Central Station, Haymarket, UTS, Sydney Tech and Darling Harbour past the ABC building and the UTS Dr Chau Chak

Wing Building. It culminates at the Powerhouse Museum and was hailed as being very important to ensuring excellent access to the museum area.

The Tram Shed under construction and in use. Note the trams, an example of which is on display in the museum (page 9).



A final word....

For me the single outstanding feature of the Powerhouse complex is the way that the original buildings demonstrate the amazing enterprise, agility and skill of that generation of Australians.

This booklet restricts itself mainly to the remaining heritage factors of the buildings themselves, but unless the total project is understood, the magnitude of the feat of the simultaneous construction of these elaborate buildings cannot be appreciated.

The 1899 buildings themselves were only a fraction of the total tram project. Apart from the ten kilometres of dual tram lines and electrical supply lines, and the provision for opening day of over forty trams, this involved the sourcing, ordering, transporting and installation of four steam engines imported from Wisconsin, US, four generators imported from New York, fourteen boilers, two electric 30 ton travelling cranes with associated tracks and steel columns and storage batteries to cover periods of peak demand. A tunnel of some 2000 feet, made from locally concrete pipes of 6 foot diameter, supplied cooling water from Darling Harbour, and this is still used as a heat bank to assist temperature control in the modern building.

And this was a small fraction of the enterprise that was being displayed to get the city its modern transport system. Similar projects were under way elsewhere: by 1909 there were trams to Mosman, Chatswood, Lane Cove, The Spit and Northbridge on the north of the harbour alone, with similar developments to the south, east and west. Power generation increased exponentially.

The tramway from George Street, city, to John Street, Pyrmont, was inaugurated on 8 December, 1899, two years and one month after the passage of enabling legislation. There was criticism of delay, and approximately 10% cost overruns, but this was explained by the line being extended more than had

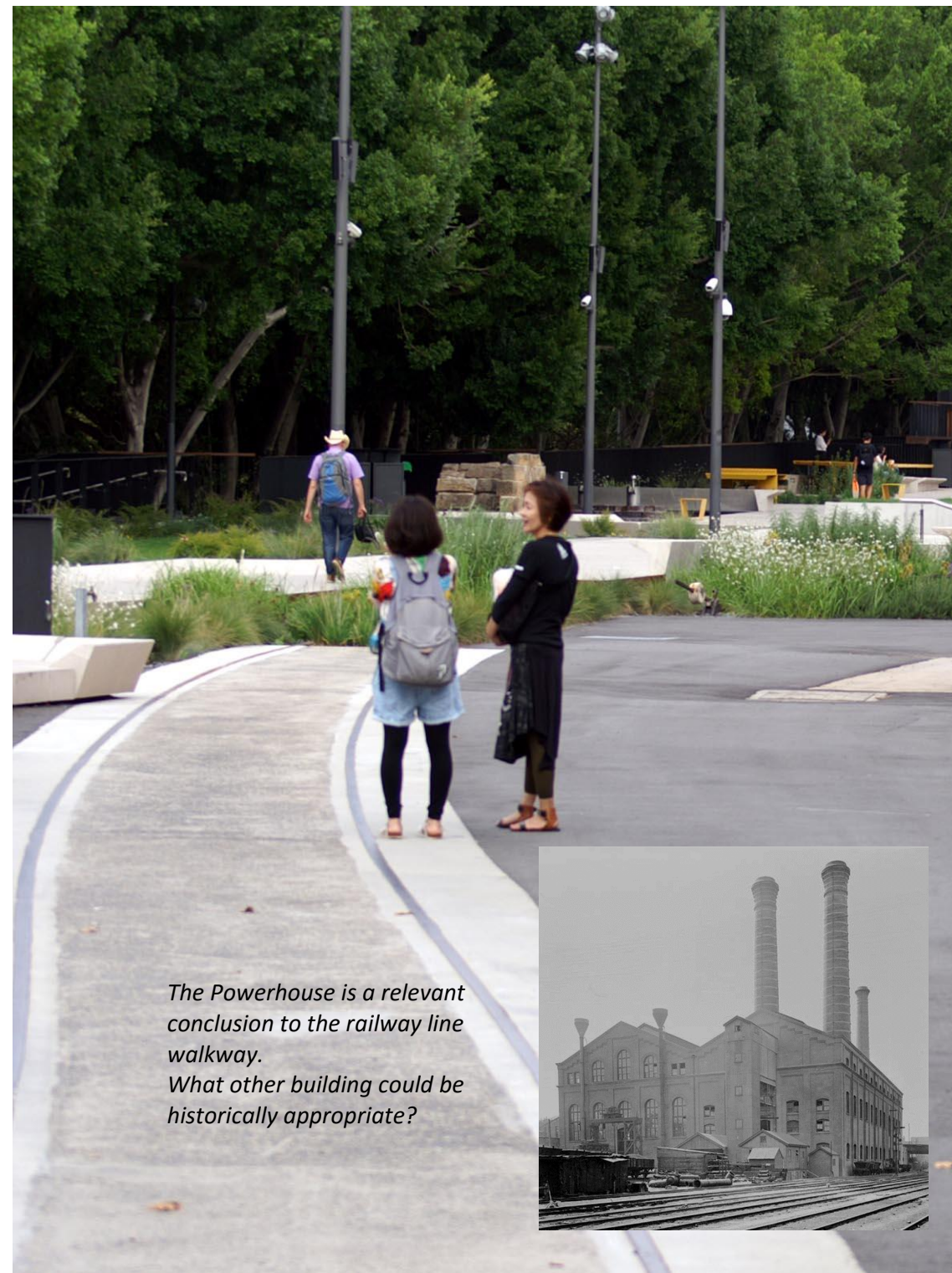
The Ultimo Post Office

The former Ultimo Post Office is currently used as the base for the 200+ volunteers that work at Powerhouse Museum. It is a small, neat building, beautifully made of brick with sandstone trimmings. It has a heritage classification.

From the National Trust statement:

‘Although not part of the Power House complex, Ultimo Post Office at the south east corner of Harris Street and William Henry Street adjoins the site. Despite being dwarfed by the Power House, it nevertheless maintains its own identity and emphasizes the scale of the Power House.

‘It was built in 1901 by the N.S.W. Public Works Department for the then newly formed Commonwealth Government. It was designed by Walter Vernon, the N.S.W. Government Architect of the period, and is a single storey Romanesque influenced exposed brick building with stone sterobate and slate pitched roof. It is of stepped level because of the falling site. The dominating feature is a small, but ponderous stone arched double faceted corner entrance porch’.



*The Powerhouse is a relevant conclusion to the railway line walkway.
What other building could be historically appropriate?*

The Harwood Building

The first PHM building to be reached is the Harwood Building.

This was the first major tram shed in Sydney. The contract for the construction of the shed was let on 3 January 1898, to the local firm of Stewart & Co. The building as completed on 8 December 1899 was 275 feet long, with nine bays, accommodating 108 trams on twelve tracks, with maintenance pits, cranes and other necessary equipment. The building is brick, with a sawtooth roof. Despite its mundane function, the building was solidly built, with decorative brickwork and sandstone features – it has stood the test of time. It ceased operation as a tram depot in 1953.

It is now a museum library, curatorial office and climate controlled area which stores valuable items and provides space for conservation laboratories and workshops. Objects receive world class curatorial care and are prepared for loan for exhibitions in Australian capital city and regional museums, and indeed for museums throughout the world. Facilities for this work will have to be re-created elsewhere.

The building was placed on the National Trust Heritage Register in 1997. Its traditional brick construction forms an interesting counterpoint to the Chau Chak Wing building to the south, as seen in the illustration.



In the 1902 additions to the Turbine Hall special ceramic-coated bricks formed a frieze that was both decorative and functional, ensuring no degradation of the bricks over the century, despite exposure to a very harsh industrial environment. The wall is also illustrated on page 5 where the huge engaged piers are obvious.

Why is the PHM brickwork significant?

Governor Phillip found a brickmaker, one James Bloodworth, among his convicts, and also suitable brickmaking clay near the current Chinatown. This was the start of a huge local industry. By the time of Governor Macquarie, quality buildings were being erected, including some still standing in Macquarie Street. The area of Brickfield Hill, near Sydney University, was developed for brickmaking, but by 1840 the city had spread to this area and brickworks themselves were set up in areas such as St Peters, where manufacturing continued until 1983. However, many of the Powerhouse bricks, particularly the 'commons', were made in the area of modern Chinatown.

Bricks were produced in many varieties, depending on aesthetic requirements and intended function. The Powerhouse structures contain, for the knowledgeable historian, a very valuable sampling of these varieties over the period 1899 to 1940. Further, the massive scale of the walls, and their decorative embellishments, provide excellent examples of brickmaking skill and techniques, both in industrial and commercial applications, which meet specific quality, appearance and size standards. The building adjoins the UTS Dr Chau Chak Wing Building, a modern icon of innovative brickwork.

The brickwork of the museum

There are at least ten million bricks in the retained original buildings. Walls are up to 1.8 metres thick, and a wide variety of brick types were used, depending on function and appearance. From the outset the builders emphasized not just strength and utility, but classical architectural features and planned decorative functions. This tradition was continued on in the



Switch House building
(page 10)

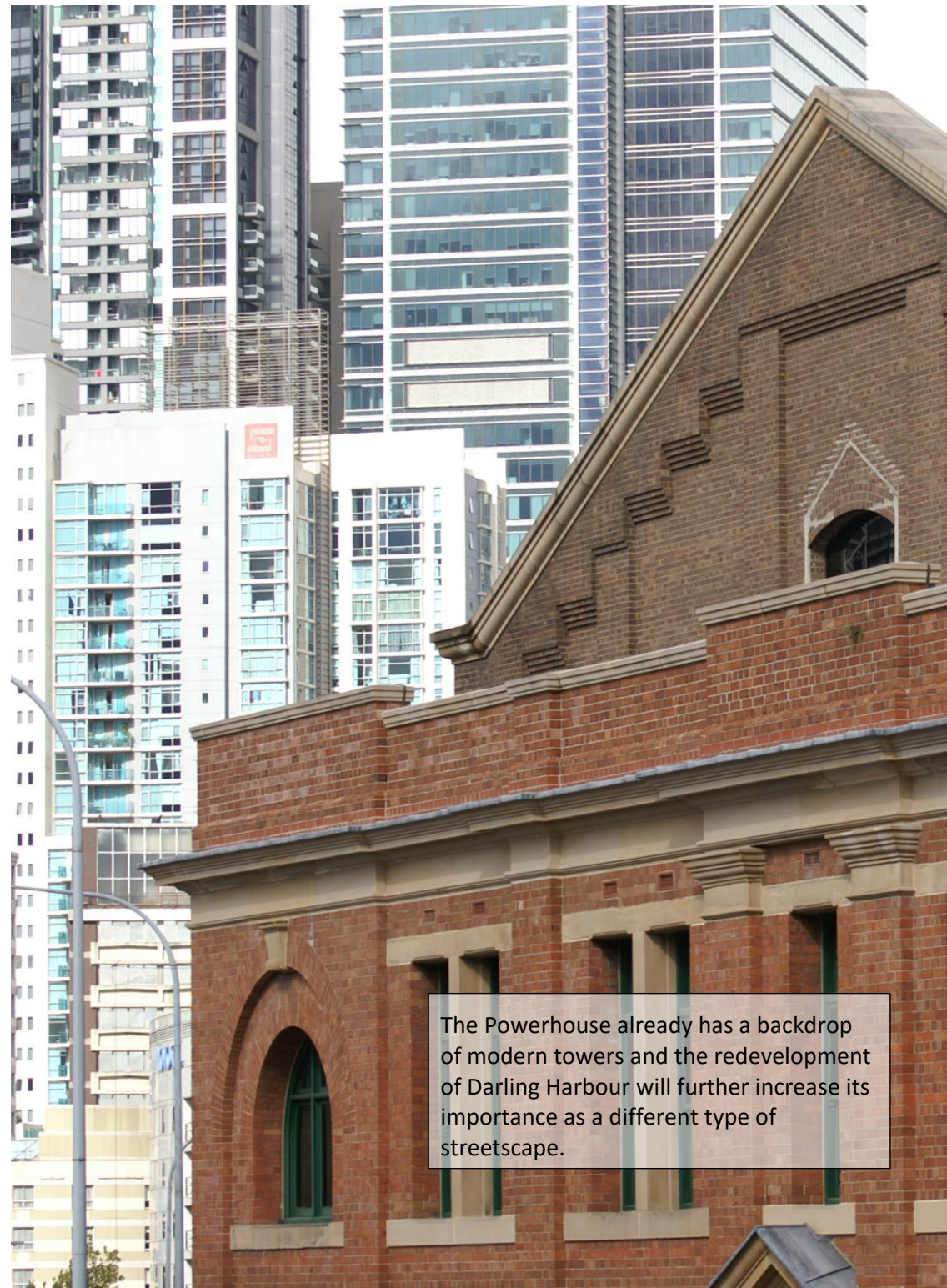
English bond brickwork is used throughout. Interlocking bricks are carried through the solid walls. It is rare to find any evidence of even surface cracks and there are no signs of subsidence or damp,

even after over 100 years.

(Right): Sandstone embellishments, properly formed brick arches and elaborate pediments were routinely included even in buildings of the most basic function.



Features found in classical archaeology were routinely included to add beauty of form to the huge walls. (Left): on an ordinary exterior wall facing the railway, we see an engaged pier, sandstone entablature and corbelled wall overhang.



The Powerhouse already has a backdrop of modern towers and the redevelopment of Darling Harbour will further increase its importance as a different type of streetscape.

The Turbine Hall



The Turbine Hall is the second largest gallery of the museum. It easily holds the hanging aircraft and the northern end is walled in as the *Experimentations* gallery.

Like all the original buildings, it was completely refurbished as part of the bicentennial museum conversion to 'better than new' standard, retaining original features as far as possible. About half of this gallery is the original turbine hall from the 1899 building; the rest is later additions.



The removal of the huge smokestack was not simple. It was first demolished to roof level, then when the 'new' bridge was built, most of the base was removed. Vestiges of the base remain.

Unfortunately, many of the special features of this building, such as the sandstone arches (right) are below the level of the present footpath.

The beautifully carved lintel of the main door is hard to photograph, (above) and unfortunately rather neglected, except by a few pigeons!



The 1899 office building: a hidden gem

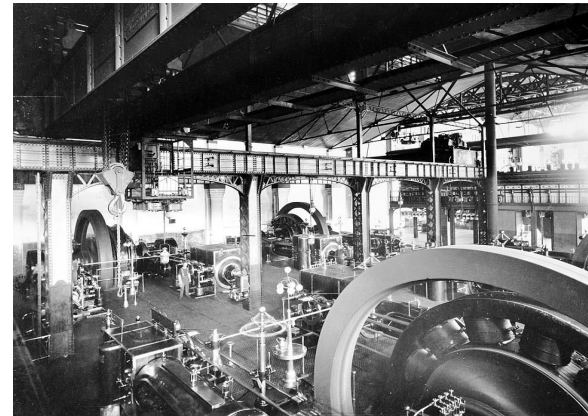


The original 1899 office building still stands, but now is largely hidden by the 'new' William Henry St Bridge of 1965.

This building was a state-of-the-art facility for the times, and the Engineers' Association described features as follows:

'The brickwork was made with double pressed brick in English bond, using moulded bricks of the same type for trimming. Beneath the first floor front windows there is panelling with the bricks laid in herringbone bond. The building has sandstone dressings, while the front elevation features an arched stereobate of cyclopean stone. In the centre of the front elevation is a triangulated sandstone pediment above a tripartite lunette containing coloured lead lights. This, in turn, surmounts a massive delicately carved stone lintel incorporating a descriptive legend with the opening date and a stylised representation of electricity.'

The Engine Room



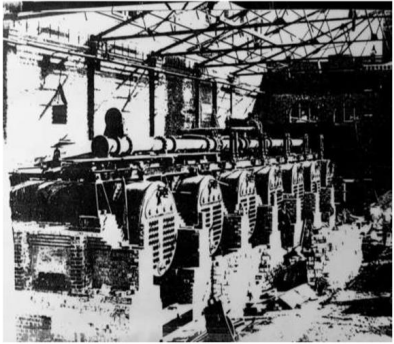
The original 1899 engine room is now the museum's steam gallery. The picture (left) shows an early stage of development (floor size about 60m x 32m). The Case electric crane seen on the gantry below is original 1898 equipment and one few remaining in the world. It is still potentially usable. The Allis-Chalmers engines seen in

the original engine room were, like the crane, imported from the United States.

It is eminently appropriate that the best collection of steam engines in the southern hemisphere, and one of the best in the world, should be housed in this historic area.



The Boiler House / Transport Gallery



- This is to the south of the original pump room behind the chimney, forming the northern end of the main display gallery. There were fourteen locally made boilers in two banks of seven. The room, subsequently extended, is the modern transport gallery.

Engaged piers and other decorative features can be distinguished in this picture, but the thickness of the

walls and the strength and skill of the English bond brickwork needs to be seen at first hand. Apart from the heritage value, the sheer size of the area is breathtaking: its replication at Parramatta will not be cheap. To my certain knowledge, the simple relocation of only the Catalina flying boat in the foreground will cost over a million dollars.



Beginning in 2008, a process of modifications to the interior was carried out, for example by relocating the lift and toilets to improve presentation. Planned further improvement to the museum was abandoned due to funding cuts.

Below: the integration of the new and old buildings is almost seamless.



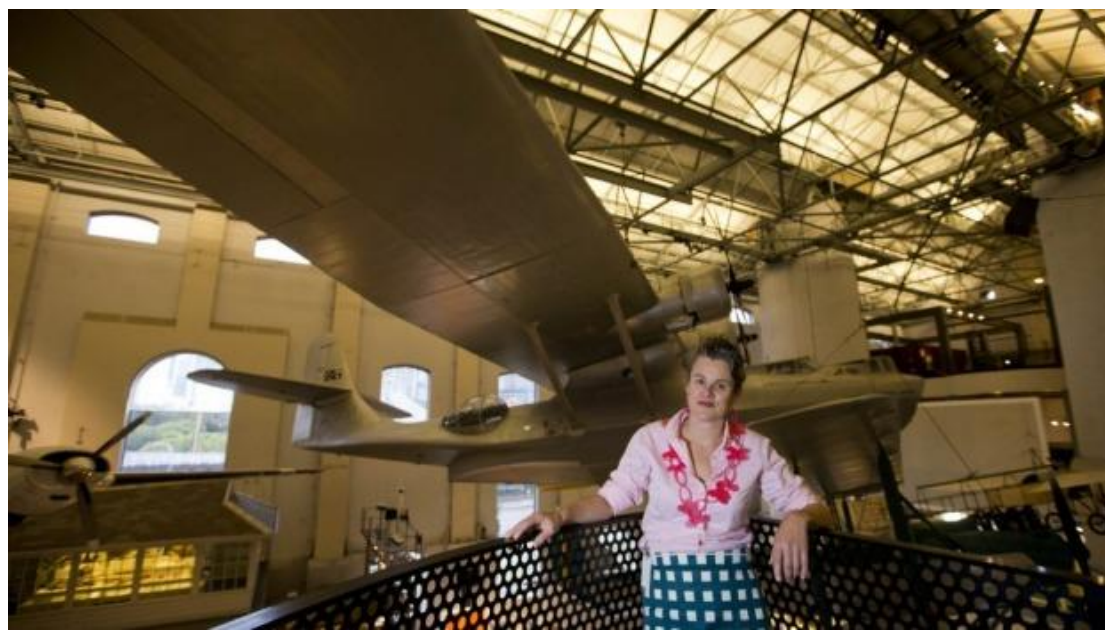
The verdict of the National Trust:

‘The Powerhouse Museum opened on March 10, 1988. The challenging design by NSW Government Architect J Thompson and Design Architect Lionel Glendenning for the design of the Powerhouse Museum converting the shell of an industrial building into one of the world’s most up-to-date museums was deservedly given the 1988 Sulman award for architectural merit..... The Trust strongly opposes the sale by the NSW Government of the Powerhouse Museum for redevelopment and would also strongly oppose any demolition of the existing historic structure, the purpose built 1988 extension and extant components that demonstrate the Powerhouse’s original use. (my underlining).

Conversion to the Museum

The Powerhouse Museum traces its origin to 1879, when a major international exhibition was held in a specially made pavilion in the Botanic Gardens. It was destroyed by fire, and a new museum was established in Harris Street adjacent to Sydney Technical College. In 1978 it was announced that the museum would be transferred to the decrepit Ultimo Power Station, as a bicentennial project. At a cost of \$89 million, the museum was opened on March 10, 1988. This is an elaborate site: the main museum building contains five levels, three courtyards and a cafeteria, as well as some offices. There are potentially over 14 kilometres of display corridors.

Workshops, library, storage and additional office space is located in the annexed nearby tram sheds, the Harwood Building (page 2). The Ultimo Post Office (page 18) was also added to the museum complex in 1988.



The Transport Gallery is undoubtedly the 'wow factor' of the museum.

This 1898 model tram is in an ideal setting, in a building that supplied its power and adjoins its original depot (see page 2).



The new building under construction; Ultimo Post Office is in the foreground.



The 1926 Switch House

A new multi-level, multi-room Switch House, incorporating transformer banks, new control room and accommodation for the whole of the high tension switchgear was begun in 1922 and completed in December, 1926.

One would expect that such a utilitarian building would be made to a minimum budget, but again attention was given to design and architectural modernity. The building is in the then fashionable Art Deco style, and forms an interesting comparison with the adjoining buildings from the 1900s. Again, there was particular attention to brickwork (see pages 16-17).



The Switch House, with its relatively few windows, is ideal for displays in which valuable objects are light-sensitive. The provision of such a facility will be vital at Parramatta.

Below: a late picture of the Power House shows all major buildings including the Ultimo Post Office (lower front) and later buildings to be demolished to enable new museum construction.

