



Figure 15.6 Front courtyard during works (Museum of Applied Arts and Sciences Annual Report 2011–12 p. 8)



Figure 15.7 Upgraded front courtyard (Museum of Applied Arts and Sciences Annual Report 2011–12 p. 8)



Figure 15.8 Level 3 former entrance (Museum of Applied Arts and Sciences Annual Report 2011–12 p. 8)



Figure 15.9 Level 3 temporary exhibition room (Museum of Applied Arts and Sciences Annual Report 2011–12 p. 8)

15.2 PHYSICAL ANALYSIS OF THE WRAN BUILDING

An overall photo register and images of the Wran Building as of 2020 is presented in Section 15.6 below.

15.2.1 Site and Setting

The Wran Building forms part of the Powerhouse Ultimo Site at 500 Harris Street, Ultimo on the corner of William Henry Street and Harris Street and represents the Museum’s formal entry which is made through the Galleria on Level 3. The northern face of the Wran Building faces the Ultimo Post Office and William Henry Street, the eastern façade envelopes the western façade of the Engine a House and the Turbine Hall. The southern wall faces the Level 3 forecourt and Macarthur Street.

The building predominantly fronts into Harris Street and is the most prominent component of the landscape when viewed from Darling Drive and nearby Harris, Systrum, Macarthur, Hay and William Henry Streets.

15.2.2 Built Elements¹²

When it was built the Wran building comprised of two vaulted spaces- Vault 1 (The Galleria) and Vault 2. The Harris Street forecourt (‘Level 3’ of the site) and the Grace Bros Courtyard (now known as the Level 1 Courtyard) were formed at the same time and a brief description of the Level 1 Courtyard is included in this section.

Today, Vault 1 is a linear barrel space which contains the Museum’s principal entry, and the former entry, Vault 2, the Touring Exhibition Hall, an incomplete half-vault.

The Wran Building has been altered significantly since its construction in 1988, particularly during the 2011–2013 revitalisation project.

Vault 1 (The Galleria) has a high, partially glazed, arched steel roof with glazed facades on the north, south and west. The northern elevation represents the rear of the building and is associated with a series of fire doors that open onto a courtyard that leads to William Henry Street via a set of stairs. Vault 1 (The Galleria) meets Vault 2 along its northern and southern elevations. As designed by Glendenning, The Galleria abuts, yet is detached from, the Turbine Hall to the east through an offset in its arched roof which extends over the hall stone and brick parapet, displaying the carefully articulated distinction between the old and the new. The same technique has been executed at its junction with the Engine Room. Vault 1 houses the Museum’s permanent exhibits – Locomotive No 1 (near the southern end) and the Boulton and Watt Beam Engine (towards the northern end). Modifications to the building in 2013 and the removal of a raised viewing platform mean that the Boulton and Watt Engine can no longer be viewed as originally intended. The Boardroom – a simplified model of the halls’ Turbine Hall / Boiler House on Level 5, sits at the southern end of The Galleria.

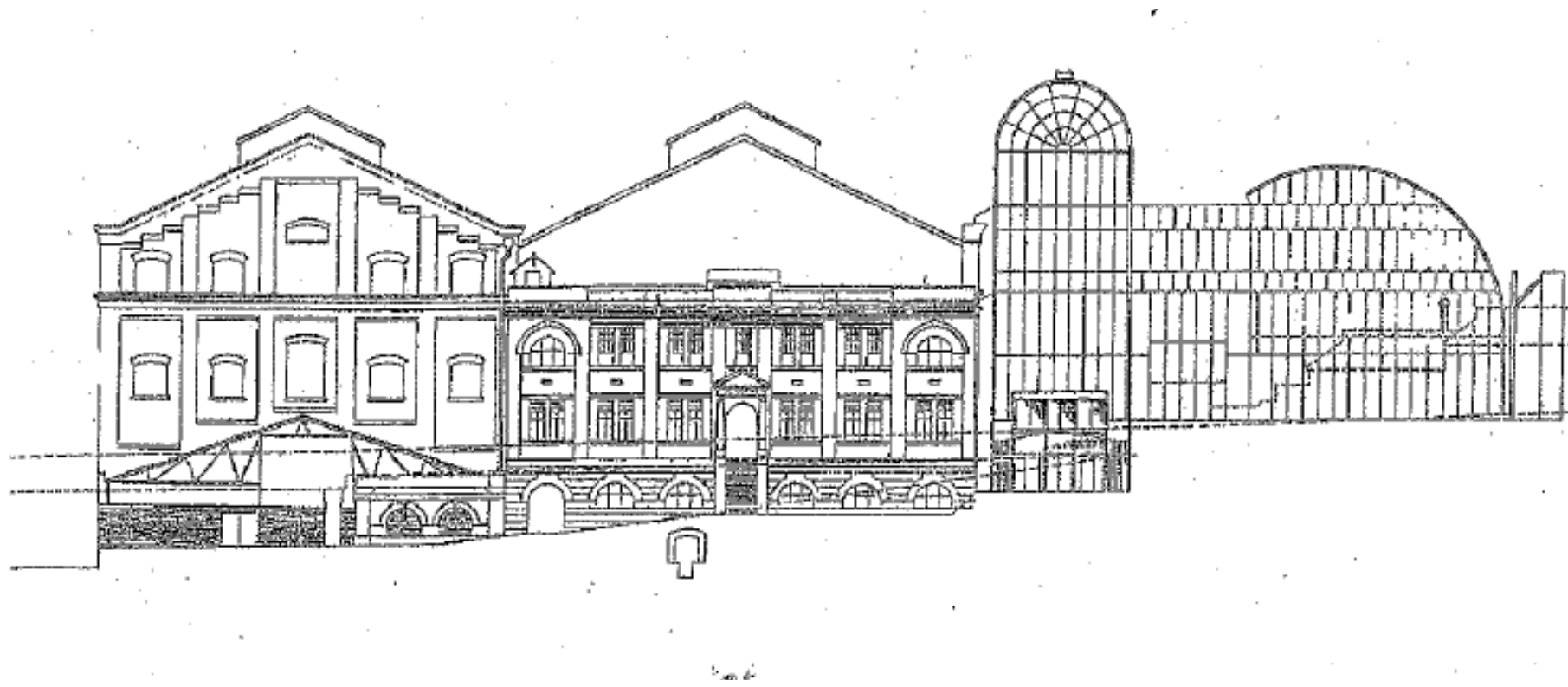


Figure 15.10 North elevation of the Powerhouse Museum in 1988 (Source: National Trust)



Figure 15.11 South elevation of the Powerhouse Museum in 1988 (Source: National Trust)

Vault 2 (Touring Exhibition Hall) has a lower and broader scale than Vault 1 and characterised by a prominent corrugated steel roof that arcs down in a reverse curve edge. The east and south facades have glazed frontages that extend to door height and provide an exit to Harris Street and the Museum’s forecourt. The exterior of the north and south ends are finished in fibre cement sheets, painted white and marked with the Museum’s name. The same material is used on the colonnade’s finish. The Exhibition Hall is associated with a mural of the Australian sky along its northern and southern internal elevations. Its original light painted Renfoil ceiling has been painted black. The Touring Exhibition Hall is partitioned into two black box spaces for temporary exhibitions and the north end was significantly reconfigured to be used as a UTS classroom. Modifications carried out in the 2000s included the addition of black plywood panels into the building to block the natural sunlight on Level 3. The original Italian nougat tiled flooring in Vault 2 has been partly damaged by removed fitout over time and much of it is covered by carpet. Two triangular balconies located on Level 5 and originally intended to provide views of exhibitions on lower floors have now been modified and no longer function as they were intended. One looks onto an empty space while the other is being used to house lockers.

A central element between Vault 1 and Vault 2 is divided over 3 levels and occupied by studios, offices, storage and service spaces. The First Nations Design and Fashion Hub occupies the northern end of the top level.

Level 2 is used for temporary exhibitions and is occupied by a Theatrette and Theatre on Level 2 below Vault 2. Level 1 is occupied by a Digitisation Studio, plant, and storage and service spaces.

Today, the Wran Building provides access for schools and groups at Level 2 from the Macarthur St. Entry through the Galleria does not have a clear intermediate zone between the outside and the exhibition areas. The admissions desk and the cloaking facilities are located behind the west wall of the Switch House, and a visitor must turn right and go through the arched opening in the west wall of the Turbine Hall to find the reception area. The different levels within the building are generally accessed through the inclined ramp that runs parallel to the length of the building and connects Levels 1, 2, 3 and 4. A lift at the southern end connects Levels 3, 4 and 5.

A significant amount of original fabric has been retained in the Wran Building. This includes the structure and external joinery, the George Freedman designed carpets, and the ‘nougat’ tiled flooring (much of which is covered by new carpet). In addition to the interiors of the two theatres and the perforated metal balustrades.

The Level 1 Courtyard (formerly the Grace Bros Courtyard) was added at the same time as the Wran Building. It currently exists as a ‘rear courtyard’ for the site. At present it houses a rectangular box-like café (although the café ceased operations in 2020), a children’s playground and a Utility substation surface entrance. Within the Level 1 courtyard are the colourful 1988 external stair and lift shaft of the Boiler House which pay reference to the coal chutes, ash handling plant, and coal handling plant of the former Power House. Remnant tracks from where the Goods Line (Darling Harbour Rail Corridor) used to extend into the Boiler House are evident.

The brightly coloured, striped, vertical elements, whilst representative of the former coal chute on the building, detract from the significance of the Boiler House. When entering the Museum complex from the Goods Line, the large, rectangular café and covered walkway both detract from the significance of the Switch House, Turbine Hall and Boiler House.



Figure 15.12 Entry to the Level 1 Courtyard from Macarthur Street/ The Goods Line (Source: Powerhouse)



Figure 15.13 Level 1 Courtyard (Source: Curio Projects)



Figure 15.14 Level 1 Courtyard (Source: Curio Projects)



Figure 15.15 Level 1 Courtyard (utility substation surface entrance in blue) (Source: Curio Projects)

15.3 HERITAGE SIGNIFICANCE – DISCUSSION

The Wran Building is not included on any statutory heritage register for local or State significance. It is excluded from the recent 2020 SHR Listing for the Ultimo Power House and is not listed on the City of Sydney LEP. As the Wran Building is not a heritage listed item at a Local or State level, gradings of Significant components has not been prepared for this element of the site.

An independent assessment of heritage significance of the Wran Building, commissioned by Heritage NSW, was undertaken by architects Cracknell & Lonergan in 2019, the results of which were presented in a report dated January 2020.¹³ The Cracknell & Lonergan report included an assessment of the 1988 architectural additions to the Powerhouse site (i.e the Wran Building), particularly in response to the proposed statement of significance drafted by the National Trust with respect to the Wran Building and 1988 site additions specifically.

The 1988 Wran Building and additions, whilst award winning, have been subject to unsympathetic changes which have diminished the original architectural intent and reduced the ability to interpret the building as a key work of the post-modernist period. The folies facing the Harris Street entry, the original playful array of colours and other characteristics of the post-modernist architectural period have been demolished or lost...¹⁴

...The Wran building is regrettably unconvincing. The fair ground style of architecture bore reference to the exuberant darling harbour redevelopment of the 1980s with an accidental and clumsy reference to the garden palace with elements of the garden palace ‘reconstructed’ and placed around the curiously over-scaled interiors of the Wran building. ... Essentially, it is a services component which serves the main bulk of exhibition spaces contained within the original Ultimo Powerhouse structures.¹⁵

Cracknell and Lonergan recommended in their report that:

... A clear distinction must be established between the significance of the MAAS Collection and the Ultimo Powerhouse site. The significance of the two, for its aesthetic, cultural and historical merits cannot be conflated to be interwoven as implied in the National Trust listing. The subject site is not an ‘ongoing repository’ as it would fail to consider the Powerhouse collection held at all of its other sites, but the collection can be described as such.¹⁶

Physically, the Wran Building has been altered significantly since 1988, particularly during the 2011–13 revitalisation project in contrast to the recommendations of the 2003 CMP that recommended that the Wran Building be retained with no changes, including to Vault 1 and Vault 2 and the open character of the mezzanines due to its representation of the ‘image of the Powerhouse Museum’.¹⁷ The level of alterations to the Wran Building is to the extent that it has been argued that the Wran Building and museum design has deviated so far from the original design intent as to no longer be representative of the original flow design of the building and award winning museum design.

The Wran Building is considered to have some significance at a local level. It has some significance for its role in the adaptive reuse of the Ultimo Power House buildings, and has some significance for its post-modernist style and associations with new approaches to museum making in the late 1980s.¹⁸

It is also important to note that whilst the construction of the Wran building was innovative for its adaptive reuse of the site at the time, it also impacts the visibility and readability of the heritage buildings within the site.



Figure 15.16 Powerhouse Museum 1980s Wran Building from Harris Street, 1988 original architectural presentation (Top) compared with 2018 (Above) (Source: Cracknell & Lonergan 2020: 9)

15.4 OPPORTUNITIES AND CONSTRAINTS

Opportunities

- Consider the original design intent for the Wran Building, and use these principles to consider the movement of visitors through the Museum.
- Ensure that new works, such as any demolition, alterations and additions, and new buildings, retain the heritage significance of the Powerhouse Ultimo site.
- The 1988 adaptive re-use of the Power House Buildings into the Powerhouse Museum, including the construction of the Wran Building, further obscured rather than enhanced the industrial history of the site. Future use of the site should seek to identify any opportunities to re-connect with and explore the industrial history of the site, possibly via future development choices, heritage interpretation initiatives etc. The industrial context of the site is particularly apparent when viewed from the Goods Line entry to the site, where the industrial buildings are more prominent.
- Ensuring the design principles of the 1988 development are appended to the CMP and are used as a guide for future renewal programs.
- Over the 30 years since the Wran Building was constructed, museums and how they operate have significantly changed. There is opportunity in any renewal to ensure the embedded ambition from 1988 ‘to be radical’ has the ability to be carried forward and applied in a contemporary museum context.

Constraints

- The facades of key State Heritage Listed buildings on site, such as the Engine and Turbine Halls are obstructed both physically and visually by the Wran Building and other 1980s additions to the site. This configuration restricts the ability to interpret and appreciate the heritage buildings as they relate to one another and from different key external viewpoints. Opportunities to improve the visual access to the heritage listed buildings in the future would be encouraged.
- The Wran Building has been subject to numerous design changes over the years, limiting the ability for the building in its current iteration to convey the original design intent of the 1980s adaptive reuse of the site.
- Visually, the Wran Building obscures the connection of the Ultimo Post Office to the original Power House buildings, impacting its readability and presence on site. In its current form the Wran Building limits the ability for providing a more meaningful curtilage to be established around the historical Post Office.

15.5 ITEM-SPECIFIC CONSERVATION POLICIES

15.5.1 Powerhouse Museum Design Principles and the approach to change

The Powerhouse Museum is an evolving entity which has the potential to enhance exhibition design, museum practice, curatorship, collection management and research. Glendenning intended that it act as a modern and radical space, informed by the past and the future. Glendenning's principles are attached at Appendix E.

Depending on the nature of any future development proposed to the Wran Building, modifications or repairs to the external structural elements may be subject to the requirement for a Heritage Impact Statement to be prepared to ensure that there are no adverse physical or visual impacts on the State-Heritage listed Items on site.

15.6 PHOTO REGISTER FOR THE WRAN BUILDING

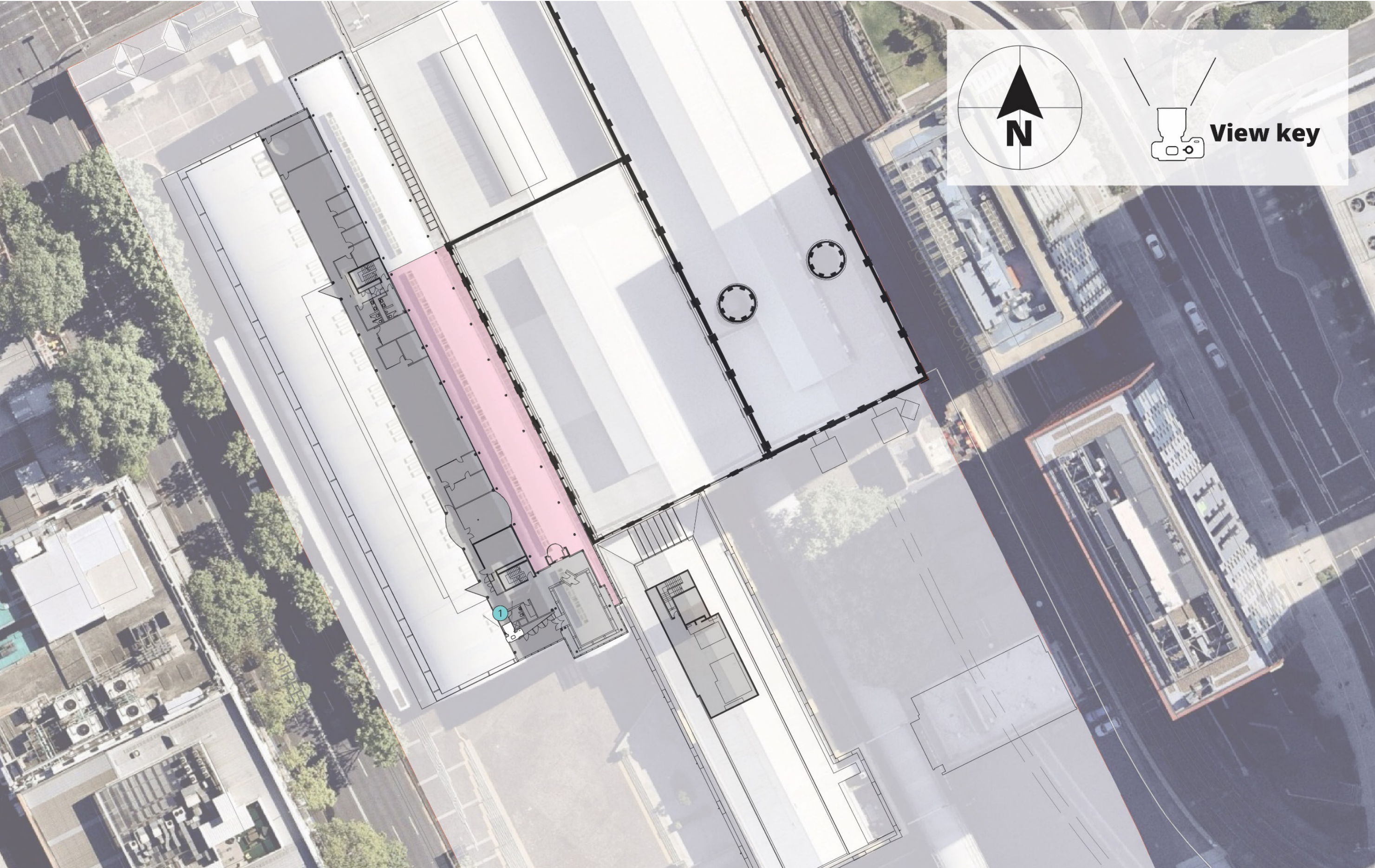


Figure 15.17 Wrn Building Photo Register (Level 5)



Wran Building Viewpoint 1: Level 5

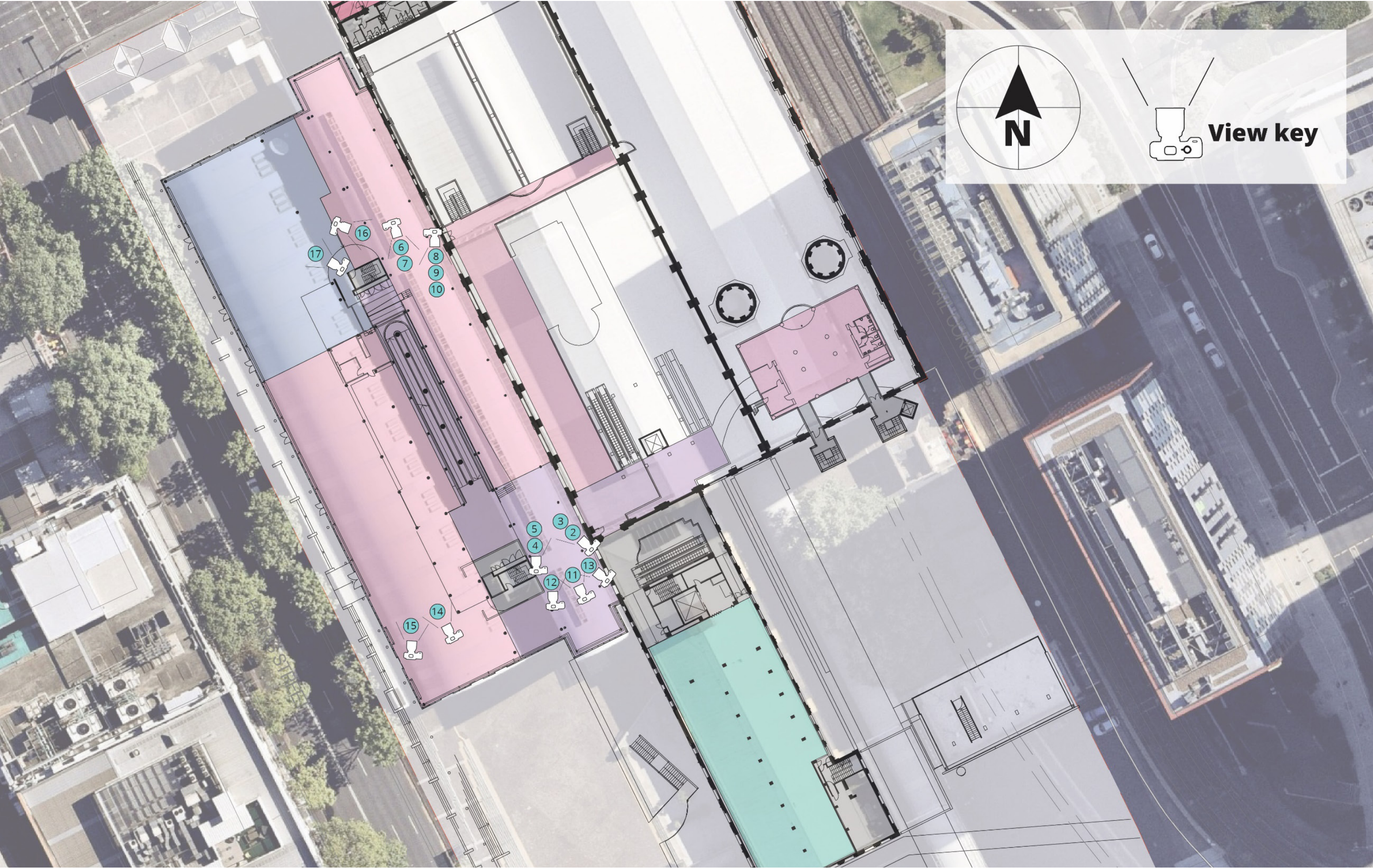
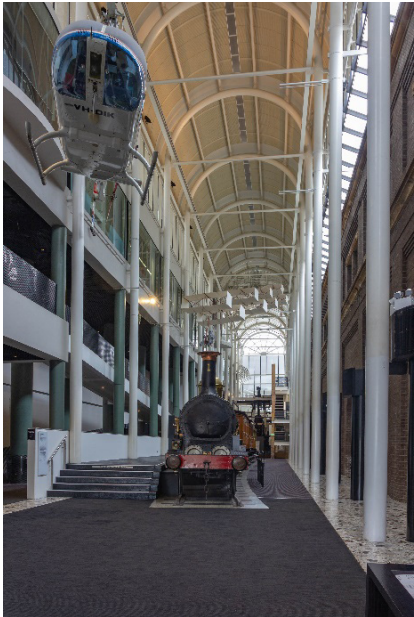


Figure 15.18 Wran Building Photo Register (Level 3)



Wran Building Viewpoint 2: Level 3



Wran Building Viewpoint 3: Level 3



Wran Building Viewpoint 4: Level 3



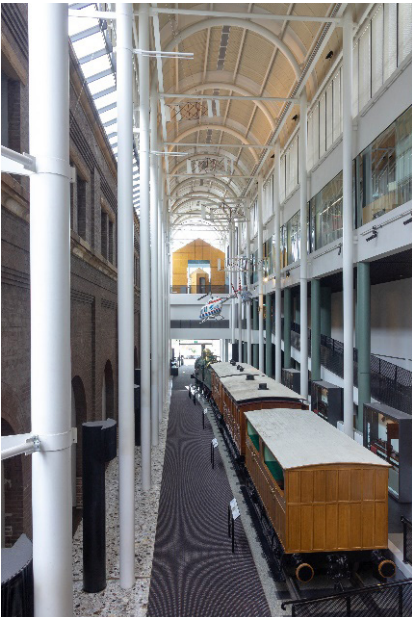
Wran Building Viewpoint 5: Level 3



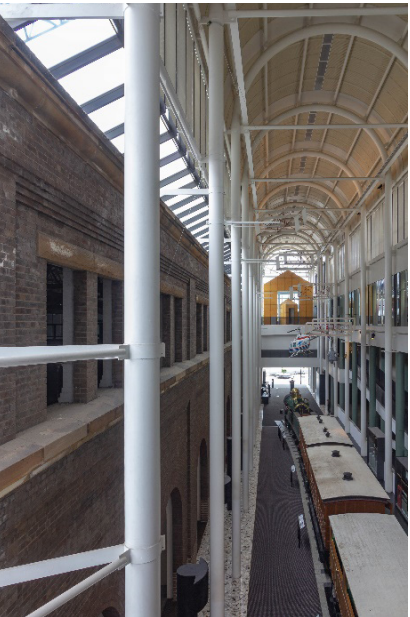
Wran Building Viewpoint 6: Level 3



Wran Building Viewpoint 7: Level 3



Wran Building Viewpoint 8: Level 3



Wran Building Viewpoint 9: Level 3



Wran Building Viewpoint 10: Level 3



Wran Building Viewpoint 11: Level 3



Wran Building Viewpoint 12: Level 3



Wran Building Viewpoint 13: Level 3



Wran Building Viewpoint 14: Level 3



Wran Building Viewpoint 15: Level 3



Wran Building Viewpoint 16: Level 3



Wran Building Viewpoint 17: Level 3

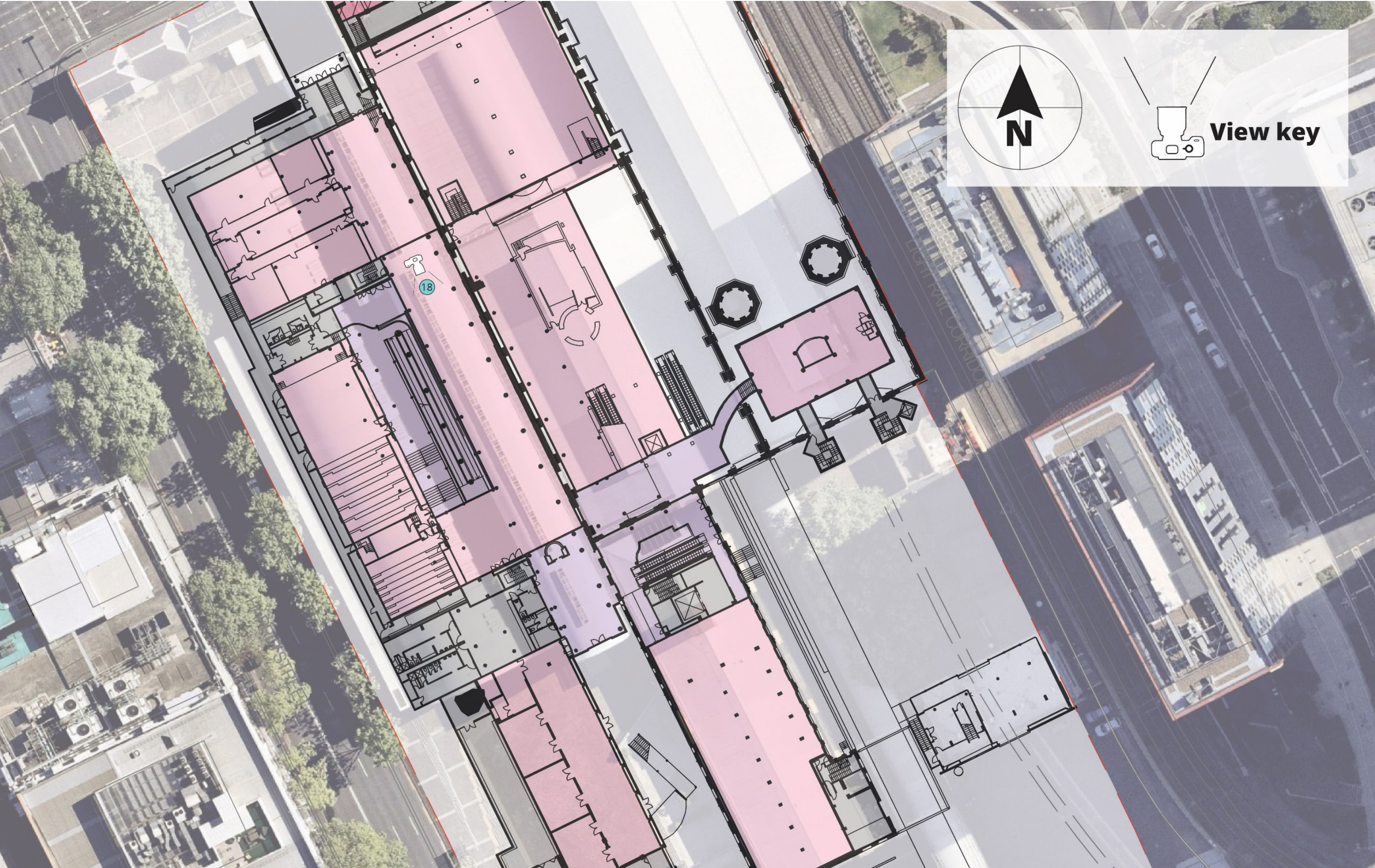


Figure 15.19 Wran Building Photo Register (Level 2)



Wran Building Viewpoint 18: Level 2

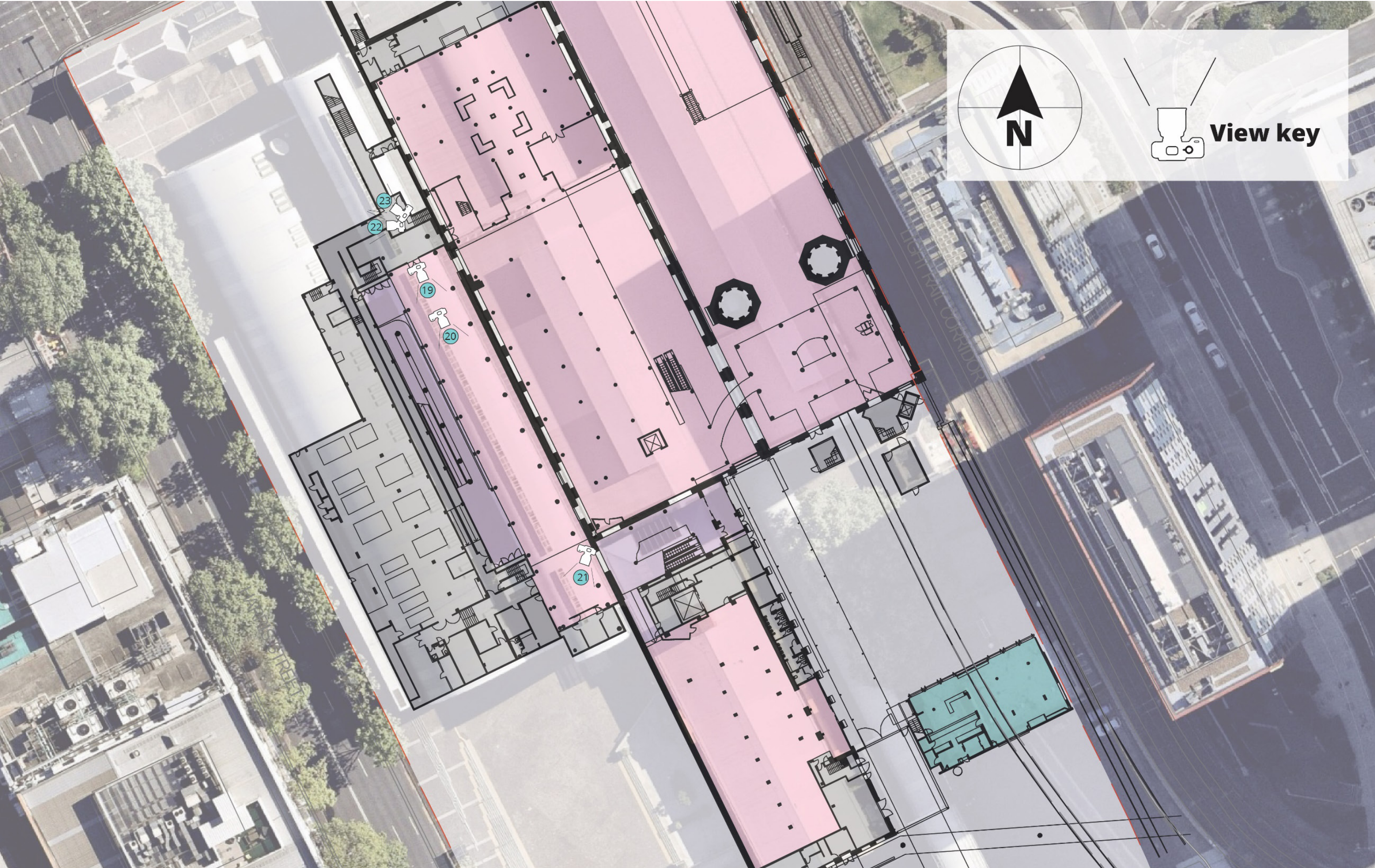


Figure 15.20 Wran Building View Key (Level 1)



Wran Building Viewpoint 19: Level 1



Wran Building Viewpoint 20: Level 1



Wran Building Viewpoint 21: Level 1



Wran Building Viewpoint 22: Level 1



Wran Building Viewpoint 23: Level 1

15.7 ENDNOTES

1

Architectural Projects, 2003, p. 29.

2

Dr Lindsay Sharp cited in Architectural Projects, 2003, p. 29.

3

Architectural Projects, 2003, p. 47.

4

Watermark Press Sydney 1997 p. 189 cited in Architectural Projects 2003 pp. 35-36.

5

Jennifer Sanders. 'Realising Memories, Reminiscences and Thoughts:' in Graeme Davison and Kimberley Webber (eds). *Yesterday's Tomorrows: The Powerhouse Museum 1880-2005*. 2005, 230-239. cited in Design 5, Powerhouse Museum Design Principles (DRAFT), with Lionel Glendenning and Richard Johnson, 2021, p. 26.

6

Architectural Projects, 2003 pp. 62-63.

7

SHR Listing, "Ultimo Power House".

8

Architectural Projects, 2003, p. 7.

9

Powerhouse Museum, Annual Report 2005-2006, p. 3.

10

Museum of Applied Arts and Sciences, Annual Report 2011-2012, p. 8-9.

11

Museum of Applied Arts and Sciences, Annual Report 2012-2013, p. 16.

12

Informed by research conducted by Design 5.

13

Cracknell & Loneragan Architects, *Assessment of Heritage Significance, Ultimo Tramways Power House Museum*, Independent Review, prepared for Heritage NSW (Rev. B, 30 Jan 2020), 2020.

14

ibid, p. 14.

15

ibid, p. 21.

16

ibid, p. 45.

17

Architectural Projects, 2003, p. 109.

18

Aurecon, 2022. *Powerhouse Ultimo – Conservation Management Plan Engagement*, p. 24 and Ms Alice-Anne Bagster, *Inquiry into government's management of the Powerhouse Museum*, 2020, Submission No 2, and Mr Peter May, *Inquiry into government's management of the Powerhouse Museum*, 2020, Submission No 5.

16 WATER COOLING SYSTEM AND MANIFOLD

16.1 HISTORY OF THE WATER COOLING SYSTEM AND MANIFOLD

Numerous factors were considered during the process of selecting the location for the Power House in the late 1800s, including accessibility to transport for coal, room for expansion, cost of land, and availability of labour sources. Of these numerous criteria, one critical factor was the ready availability of a water supply for use in the water cooling system for the new Power House—an essential feature of the functionality of the entire system. The proximity of the Ultimo site to the unlimited supply of sea water in Darling Harbour was, therefore, a key influence in finalising the selection of the Ultimo site.

The contract for construction of the water conduit connecting Darling Harbour to the Boiler House to supply seawater to the condensers, was awarded to Justin McSweeney in 1898 (Contract 18), with the shafts sunk by mid-1898, and the water conduits completed by mid-1899.¹ At the opening of the Ultimo Power House in 1899, the original 950 foot (c.289m) long, 3 feet 3 inches (c1m) diameter inlet conduit transported seawater from Darling Harbour to the pumps in the original northern Pump House, for use in the condensers in the Boiler House, while a second outlet conduit not far from the intake discharged heated condenser water back into the Harbour.² While the plans and specifications for the original conduits have not been located, it is assumed that the conduits would have been constructed from precast concrete pipes- as used in other similar projects by the Department of Public Works around this time.³ A new conduit and additional pumps was constructed in 1907–1908 to meet the need of the new generating units introduced with the construction of the Turbine House and extended Boiler House.⁴

Land reclamation works around Darling harbour in the 1920s, as well as the larger water requirements of the new 20,000kW turbines, necessitated installation of new, longer, intake and outlet conduits for the Power House. Conduit installation works commenced in 1923–24, started at the Ultimo end by the NSW Railway Department, and completed at the Darling Harbour end by the Sydney Harbour Trust. Works to complete the conduits were of a considerable scale particularly difficult—one of the most expensive works undertaken in the 1920s modernisation of the Power House. The Sydney Harbour Trust first had to first sink a shaft down to the lengths of conduit already installed by the Railway Department and then tunnel through the sandstone bedrock to extend the conduits out to the harbour’s edge. Construction works made liberal use of below-water coffer-dams with the assistance of many divers. The new conduits used two lines of precast Monier concrete pipes, each 6ft (1.83m) in diameter, laid side by side through a single tunnel through the sandstone with the space between the pipes filled with rubble, with screening chambers at the harbour’s end.

Previous Names	Water conduit
Address	Powerhouse to Murray Street to Waters Edge, Darling Harbour, NSW
Built	1898–1901
Heritage Listings	Property NSW Section 170 Register SHR 02045 “Ultimo Power House”
Non-Statutory Listings	N/A

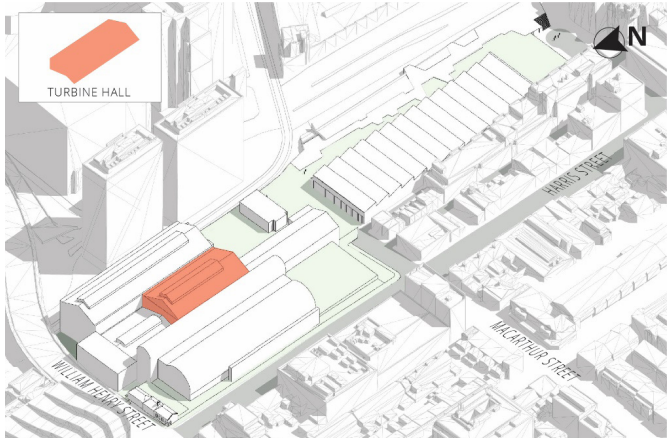


Figure 16.1 The Water Cooling System and manifold is a historic subterranean conduit with a seawater pit in the basement of the Turbine Hall, from which the conduit runs below the Ultimo Powerhouse site in a SW to NE direction to Darling Harbour. Source: (John Wardle Architects with Curio Projects overlay)



Figure 16.2 Location of the Water Cooling System and Manifold pump/seawater pit in the basement of the Turbine Hall 2020 (Source: Curio Projects)

Each precast section of the concrete pipes measured 25ft (7.62m) in length and weighed around 30 tonnes, laid on underwater concrete piers at a maximum depth of 47 feet (14.33m) underwater, extending the conduits beyond the edge of the land reclamation and out into the deep water of the Harbour⁵ (Figure 16.4 and Figure 16.5). Wharf number 39 was later constructed above the conduit at the Harbour's edge.

The new circulating water system was completed in 1928, with a greatly increased capacity from the previous system, with other elements and features including:

Trash racks for preventing the entrance of large floating objects are incorporated in the intake chambers; these are formed of reinforced concrete grills, having spaces 3 in. wide to admit the water. The screen well contains two revolving screens, made, to the designs of Ledward and Beckett Ltd., London, by the Clyde Engineering Co. Ltd.⁶

A vertical spindle type circulating water pump (Figure 16.6) was installed at the bottom of the well in the Turbine Hall basement, powered by an electric motor and connected by valves to both the inlet and outlet conduits. The use of seawater from the harbour caused ongoing issues of fouling of the conduits by marine growth, which, if left uncleaned, reduced the capacity of the pump. Low tides further compounded the fouling problem, resulting in the pump drawing in a large amount of air which in turn contributed to the corrosion of the condenser that served the large turbo-alternator (1931), eventually resulting in a major failure of this turbine.⁷

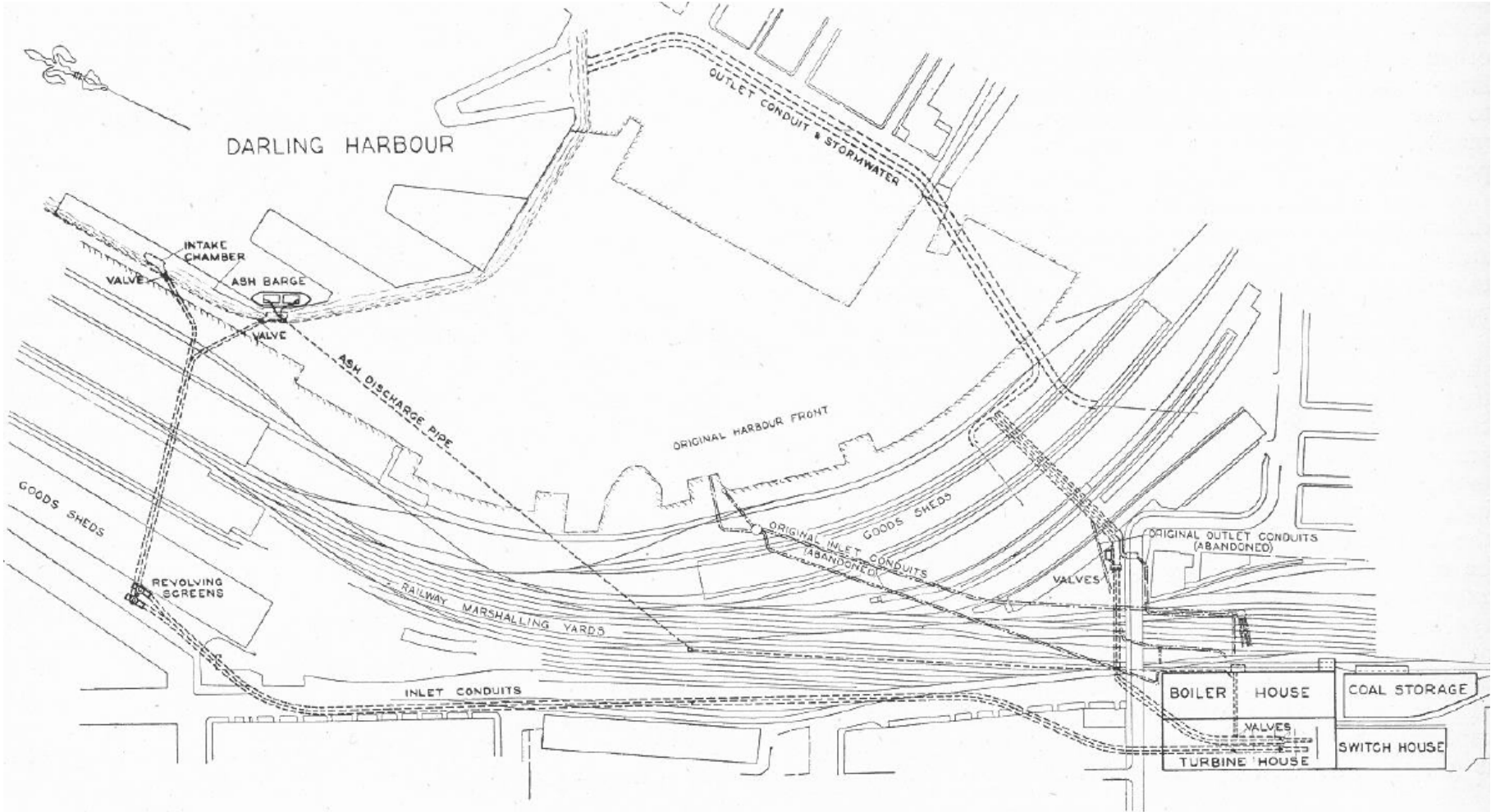


Figure 16.3 Plan showing the original 1899 conduits, and later 1920s conduits between Darling Harbour and the Power House (Source: Myers 1933, p. 255)

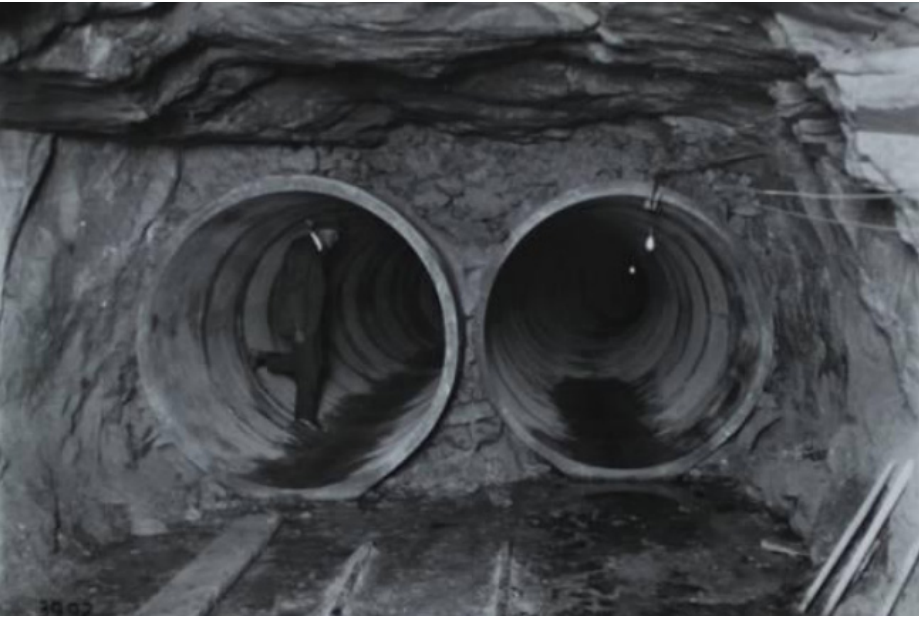


Figure 16.4 Close up of Water conduits with man for scale. Rails in the foreground were used to cart rubble to fill the space between the two pipes. (Source: State Rail NSW Item 364/46)

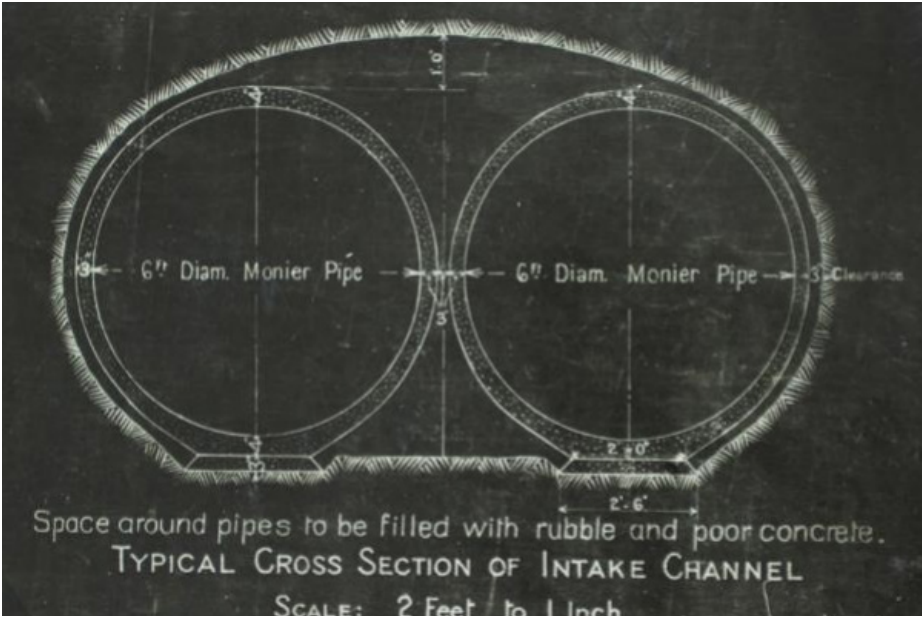


Figure 16.5 Typical Cross section of intake channel for Ultimo power house water conduits (Source: State Rail NSW, item 364/49)

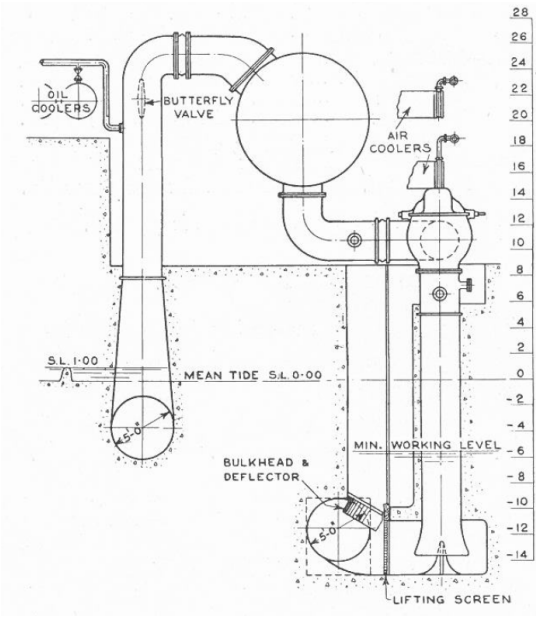


Figure 16.6 Circulating Water Suction and Discharge (Source: Myers 1933, p. 263)

After the Ultimo Power House was decommissioned in 1963, the intake and outlet conduits in Darling Harbour were used until around 1990 as a scuba diving training area for the Water Police.⁸

The design and planning for the 1980s Powerhouse Museum included inspection of the state of the existing water conduits for feasibility to adapt for use in the museum's air conditioning system (Figure 16.7).

In the early stages of design the condition of the sea water tunnels was unknown. A pair of shafts in the turbine hall, partially choked with demolition rubble, permitted the observation that they were subject to tidal rise and fall and therefore at least partially unobstructed.⁹

The active use of the tunnels for the museum's air conditioning system provides a link between the buildings historic innovation in engineering that is still in use.

In 2022, two of the underground tunnels of the Water Cooling System and Manifold remain in use for the museum's air conditioning system (Figure 16.8 to Figure 16.10), with sea water pumps located at the sea water pit in the basement of the Turbine Hall running 24/7, pumping around 7,777,000 litres of water a day.¹⁰ It appears that the original issues with fouling of the conduits that plagued the Power House, remain an issue today, when in October 2019 divers inspected the pump after its failure, and found that the heavy duty grates overlying the seawater pit were disintegrating from extensive corrosion caused by sludge sedimentation.

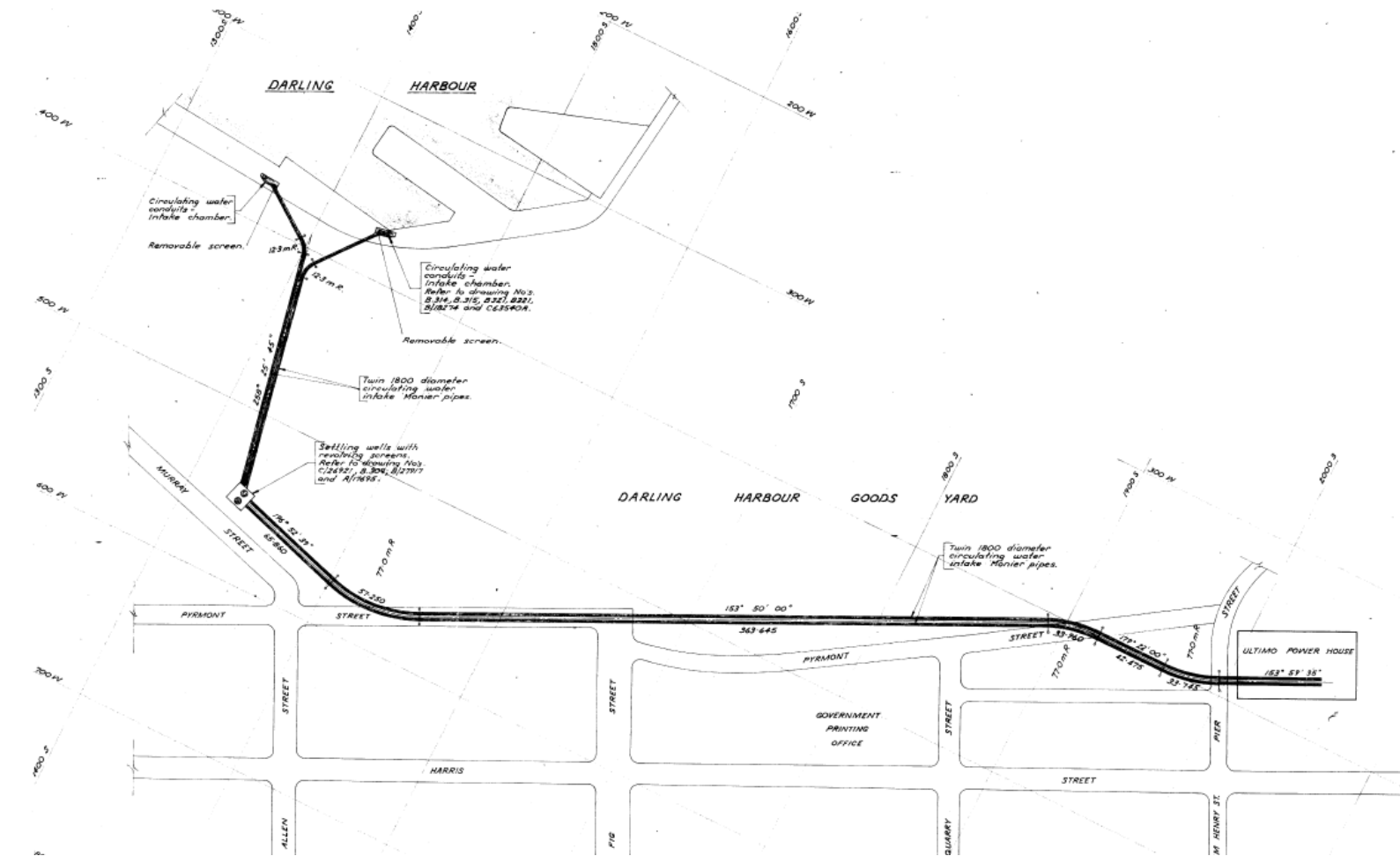


Figure 16.7 Power House Ultimo Plan of existing seawater conduits, drawn 1982 (Source: Powerhouse)



Figure 16.8 Sea Water pit and penstock valve (Source: Powerhouse)



Figure 16.9 Sea Water pump pit suction motors (Source: Powerhouse)



Figure 16.10 Sea water return pit (Source: Powerhouse)

16.2 PHYSICAL ANALYSIS OF THE WATER COOLING SYSTEM AND MANIFOLD

An overall photo register and images of the Water Cooling System and Manifold as of 2020 (as visible in the basement of the Turbine Hall) is presented in Section 16.6 below.

16.2.1 Site and Setting

The seawater pit and pump of the Water Cooling System and Manifold is located in the basement of the Turbine Hall, from which underground conduits extend from the Powerhouse to Darling Harbour, transporting cool water to the Powerhouse from the Harbour, and hot water from the Powerhouse to the water’s edge. The plan for the seawater conduits is shown in Figure 16.7.

16.2.2 Built Elements

The part of the Water cooling System and Manifold located and accessible from the basement of the Turbine House consists of a sea water pit, with Penstock control valves that control the opening and closing of the sea water inlet pipes. The sea water transported through the conduits from Darling Harbour enters the sea water pit, and is then sucked through the inlet pipes to the adjacent pump pit and to four suction pumps, used as part of the Museum’s air conditioning system.



Figure 16.9 Sea Water pump pit suction motors (Source: Powerhouse)



Figure 16.10 Sea water return pit (Source: Powerhouse)



Figure 16.8 Sea Water pit and penstock valve (Source: Powerhouse)



Figure 16.9 Sea Water pump pit suction motors (Source: Powerhouse)

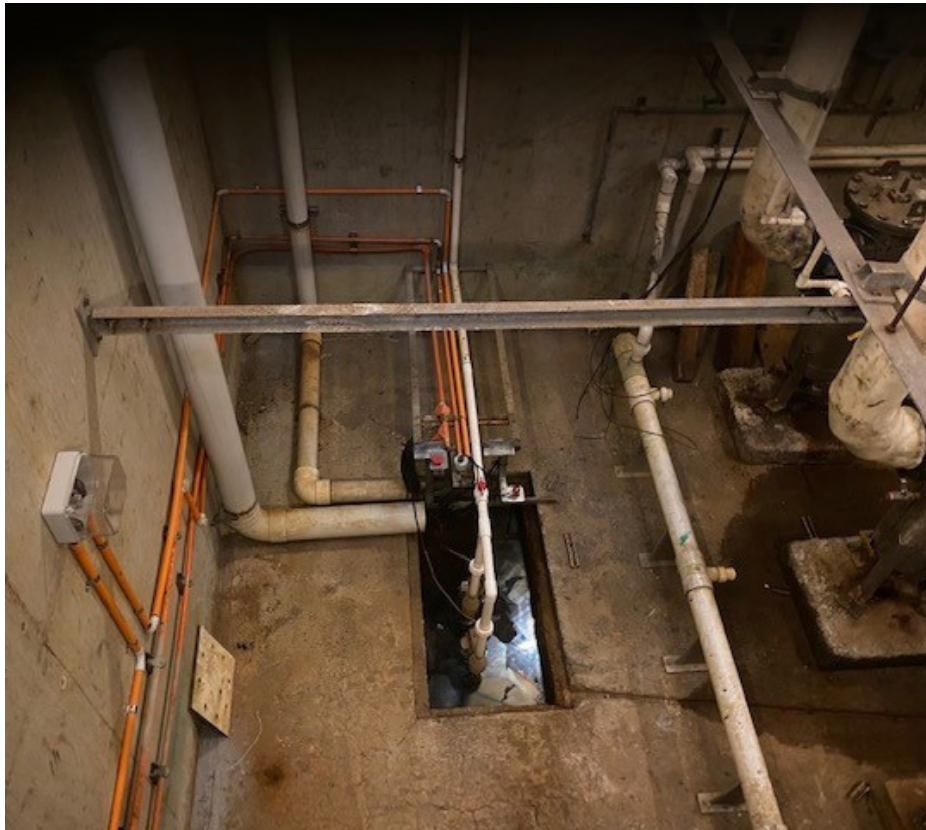


Figure 16.10 Sea water return pit (Source: Powerhouse)

16.3 HERITAGE SIGNIFICANCE

The Water Cooling System and Manifold is listed as a heritage item on the Property NSW Section 170 register. It is also included within the SHR listing for Ultimo Power House (SHR 02045).

16.3.1 Summary of Significance



The Statement of Significance for the Water Cooling System and Manifold from Property NSW’s Section 170 Register is as follows:

The water cooling system and manifold was an integral component of the operating system of the Power Station. The former Ultimo Power Station, (now the Powerhouse Museum) dating from 1899, is historically significant for being the original generating station for the supply of electricity to power the electric tramway network throughout Sydney. It was also one of the largest and most important generating stations in NSW for many years and has associations with the electrification of the suburban railway system and with the general reticulation of electrical power. The station also played a major part in the development of the Ultimo/Pyrmont area.¹¹

16.3.2 Grading of Significant Components

Detailed inspection of the condition of the part of the Water Cooling System and Manifold located within the Turbine Hall basement, and as it extends beneath the Powerhouse Ultimo site was not undertaken as part of the preparation of this CMP. Therefore, the following grading of significant components should be considered preliminary only, with potential for a more detailed assessment to be undertaken in the future as desired, via appropriate access by mechanical engineers and divers.

Table 16.1 Grading of Significant Components for the Water Cooling System and Manifold

ELEMENT	IMAGE	GRADING	NOTES
Sea Water pump pit		● EXCEPTIONAL	The sea water pump pit is original and of exceptional significance.
Sea Water return pit		● EXCEPTIONAL	The sea water return pit is original and of exceptional significance.

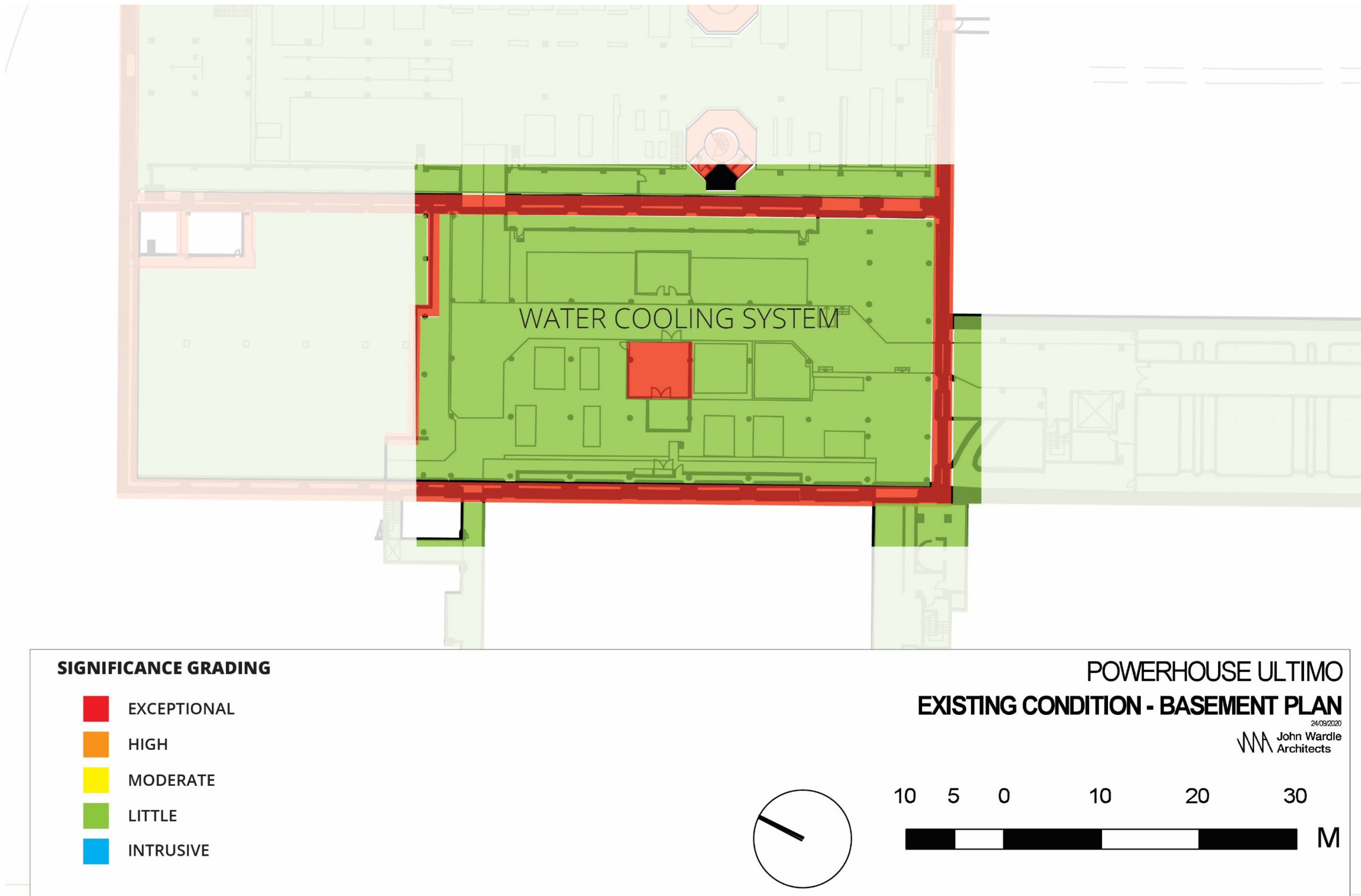


Figure 16.16 Water Cooling System Grading of Significance (Turbine Hall Basement) (Source: John Wardle Architects plan with Curio Projects overlay)

16.4 OPPORTUNITIES AND CONSTRAINTS

Opportunities and constraints specific to the Water Cooling System and Manifold include:

- Opportunities**
- There is an opportunity to interpret the use of steam throughout the buildings history, given the significant role of steam and the day to day operations of the Power House buildings.
 - Programmatic Interpretation of the history and function of the Water Cooling System and Manifold within the museum, exploring its changing use from the Power House to part of the air conditioning system of the museum.

- Constraints**
- The age of the Water Cooling system and its continued use as part of the air conditioning system of the museum.
 - Ongoing issues with corrosion and potential pump failure caused by fouling of the conduits and associated disintegration of the heavy duty grates over the seawater pit.
 - As a heritage item of State significance, the Water Cooling and Manifold System is protected under the Heritage Act 1977, and therefore any maintenance works would need to be undertaken in accordance with the relevant permits, under the advice and guidance of specialist engineers with experience in maintaining and repairing similar heritage items.
 - Any future uses of the site, including any potential changes should avoid any impacts to the Water Cooling system.

16.5 ITEM-SPECIFIC CONSERVATION POLICIES

Policy 12—Cleaning, Maintenance and Repair: Any maintenance and repair works proposed to the fabric of the Water Cooling System would need to be undertaken under the advice and guidance of specialist engineers with experience in maintaining and repairing similar heritage items.

Policy 25—Experience, Skills and Co-ordination: Any works involving the Water Cooling System and Manifold including regular inspections of the condition, maintenance, cleaning and repair works etc, should be undertaken by an appropriately qualified and experienced structural engineer.

16.6 PHOTO REGISTER FOR THE
WATER COOLING SYSTEM AND MANIFOLD

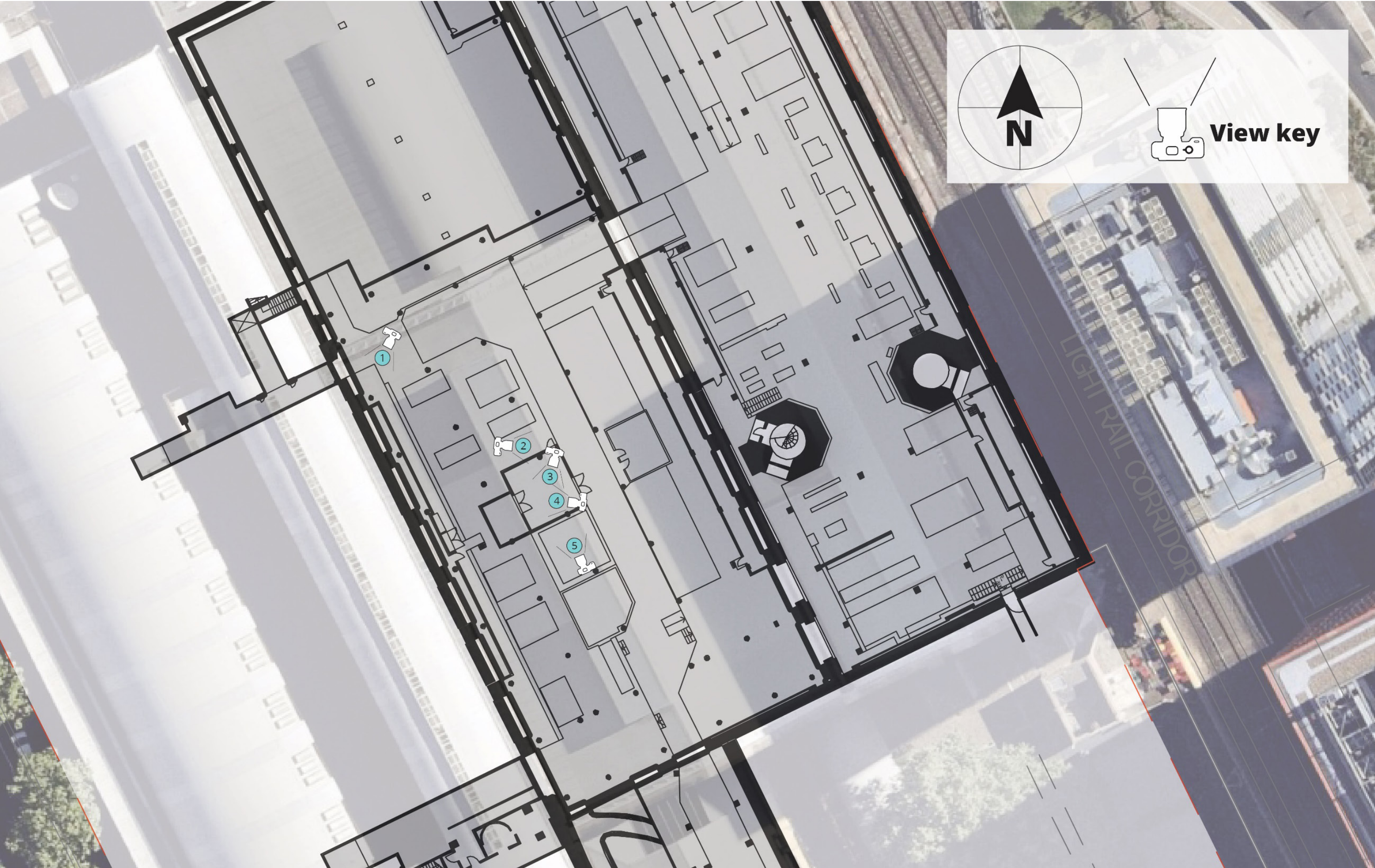


Figure 16.17 Water Cooling System and Manifold Photo Register (within the basement of the Turbine Hall).



Water Cooling System and Manifold Viewpoint 1: Turbine Hall Basement



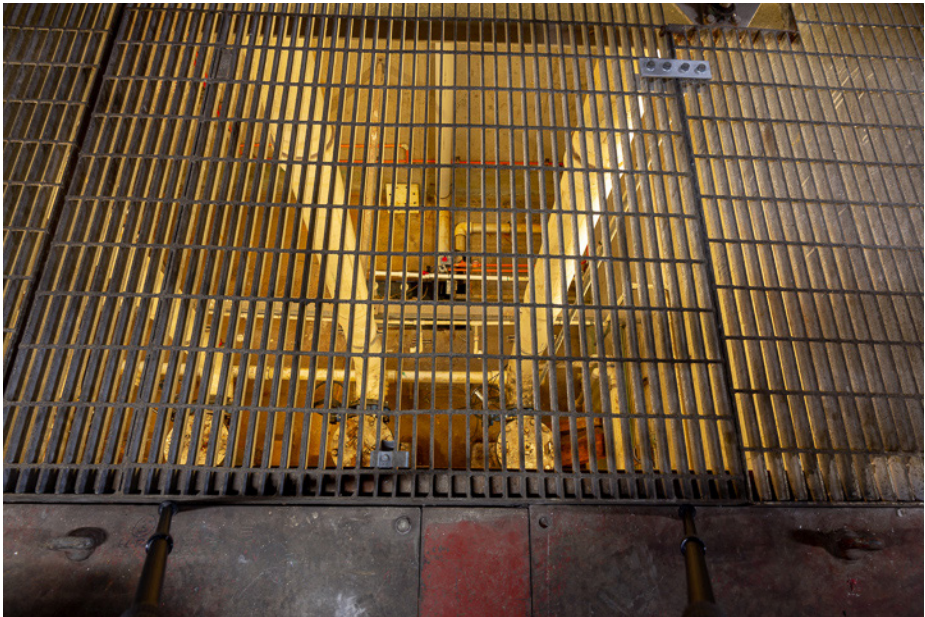
Water Cooling System and Manifold Viewpoint 2: Turbine Hall Basement



Water Cooling System and Manifold Viewpoint 3: Turbine Hall Basement



Water Cooling System and Manifold Viewpoint 4: Turbine Hall Basement



Water Cooling System and Manifold Viewpoint 5: Turbine Hall Basement

16.7 ENDNOTES

1 Department of Public Works Report, 1898, p. 26; Department of Public Works Report, 1899, pp. 23-24; Department of Public Works Report,, 1900, p. 21; Department of Public Works Report, 1901, p. 22-23.

2 Godden et al., 1984, p. 54, p. 97

3 Casey & Lowe, 2016, p. 43.

4 Godden et al., 1984, p. 54.

5 Casey & Lowe 2016, p. 43; Legislative Assembly New South Wales, The Sydney Harbour Trust Commissioners 1928, p. 3.

6 Myers 1933, p. 262.

7 Godden et al 1984, p. 136

8 Sydney Harbour Foreshore Authority (Property NSW), Section 170 Register, *Water Cooling System and Manifold*, Rowe 1988, p. 15.

9

10 Powerhouse Museum- Capitol Works Facilities Plan 2020-2021

11 Sydney Harbour Foreshore Authority (Property NSW), Section 170 Register, *Water Cooling System and Manifold*

17 THE GOODS LINE

17.1 HISTORY OF THE GOODS LINE

In 1849 the Sydney Railway Company was formed¹, they approached the Harris family requesting the purchase of 7 acres of land to construct a railway between the now Central Station and the wharfing facilities proposed for Darling Harbour.² In 1852 the land was sold (Figure 17.3) but the company faced financial difficulty and the NSW Government took over the company in 1854.³ The Darling Harbour Railway Corridor (the Goods Line) opened in 1855 as part of the first passenger line between Sydney to Parramatta.⁴

At this stage the railway ended before the Pyrmont bridge and tensions rose between the Harris family and the Government as for many years it was underutilised. In 1863 the land around the railway through the estate was recorded as dilapidated, the railway merely an embankment with the rails set on and the terminus undeveloped.⁵ The line had also provided a physical division between Harris Street and the Darling Harbour shoreline.⁶

It was not until the 1870s that the Goods Line was reactivated and went on to become vital in the transportation of Australian goods; wool, coal, shale, timber, and wheat. This included the transportation of coal from the wharfs to the Powerhouse⁷ which demanded large quantities of coal to fire their generators.⁸ The Goods Line continued operations through the 1930s Great Depression. During WWI and WWII it was used to transport both goods and troops (Figure 17.6).

The 1960s saw the port functions and wool stores moving away from Sydney which led to a decline in the functions of the railway. The Darling Harbour Goods Line was officially closed in 1984, and the Darling Harbour Goods Yards were demolished and redeveloped as a government bicentenary project between 1985–88. From the 1980s the line was generally only used by the Powerhouse Museum to move the occasional Steam Engine.⁹

In 1997 the alignment of a section of the Goods Line north of Hay Street was re-purposed for use as part of Sydney’s light rail network¹⁰ — which still operates today to the east of the Boiler House. In 2017 a section of the Goods Line was interpreted and developed as a public park and major urban connector. Sections of tracks from the Goods Line remain visible alongside the Harwood Building and in the Level 1 courtyard leading to the Boiler House.

Previous Names	Darling Harbour Goods Yard Darling Harbour Railway Corridor Darling Harbour Branch Railway
Address	(Within the Site)- East of the Harwood Building
Built	1853-1911
Heritage Listings	Property NSW Section 170 Register
Non-Statutory Listings	N/A

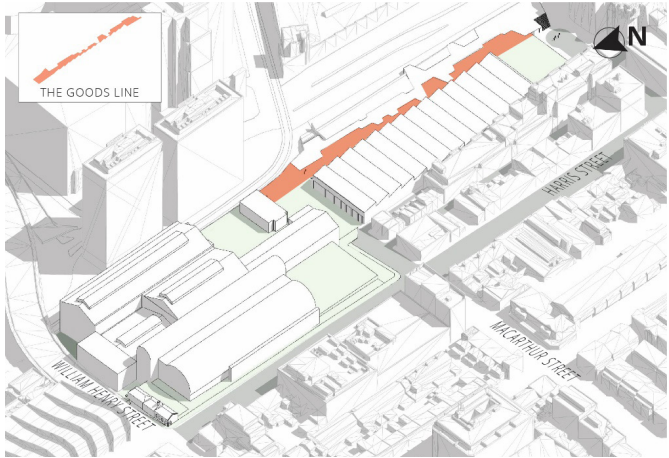


Figure 17.1 The Goods Line. (Source: John Wardle Architects with Curio Projects overlay)



Figure 17.2 The Goods Line with view north towards Stage 2, Harwood building on left (Source: Powerhouse)

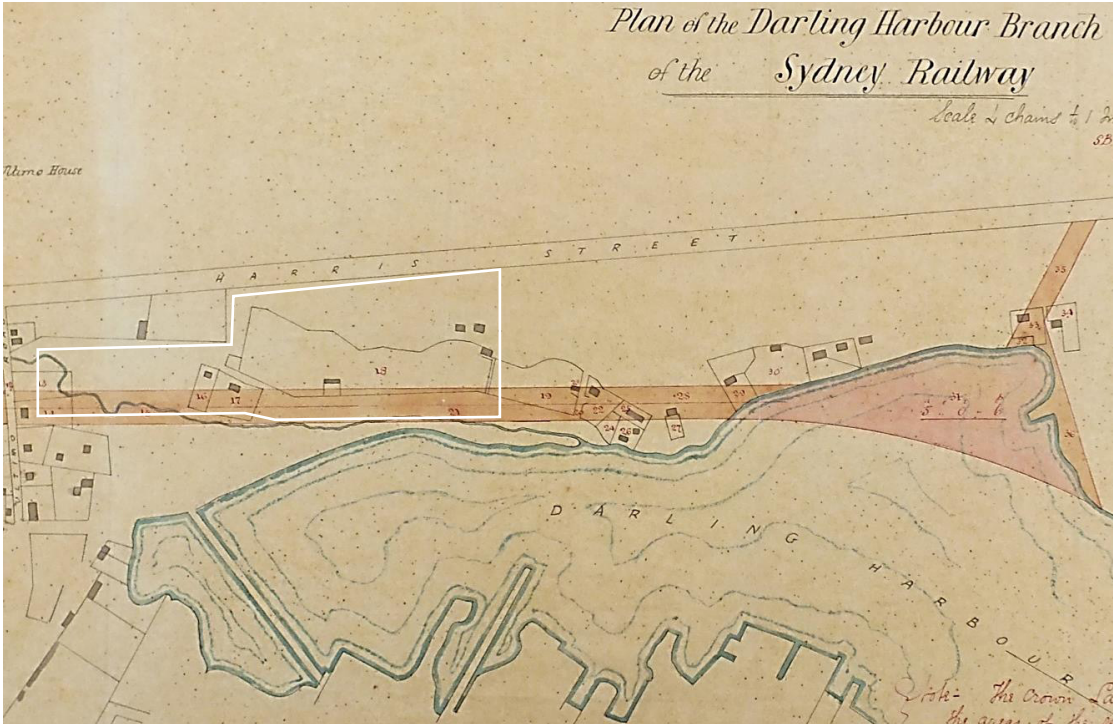


Figure 17.3 c.1853 plan showing land resumed for goods line (Source: State Records NSW AO Map 6831) with Curio overlay



Figure 17.4 Ultimo Goods Line with locomotive, date unknown (Source: Powerhouse)

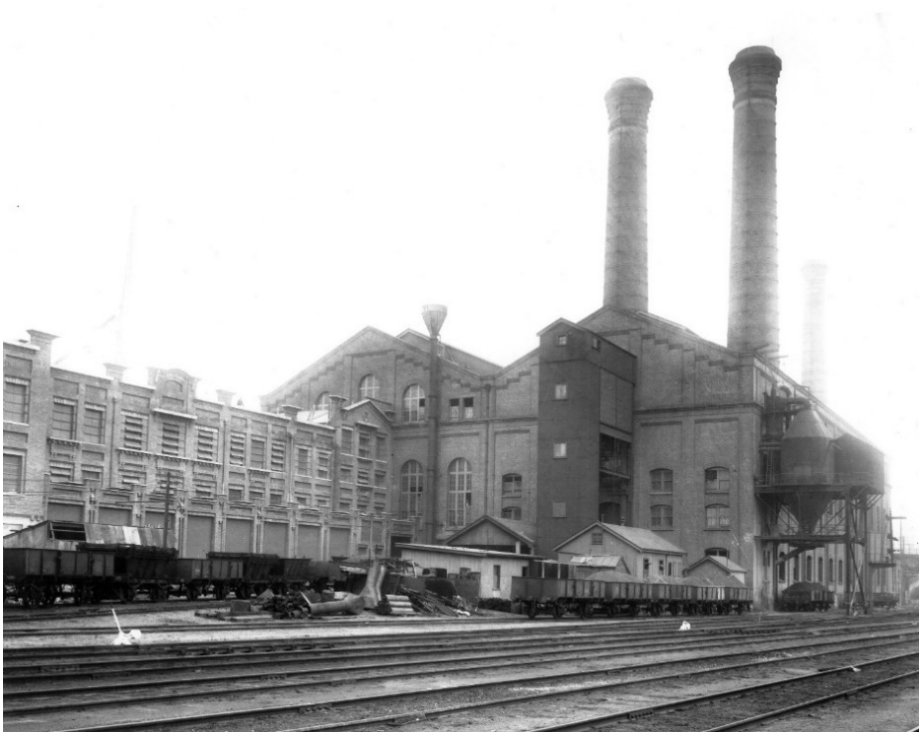


Figure 17.5 Ultimo Power House and Goods Line, date unknown (Source: City of Sydney SRC 14562)

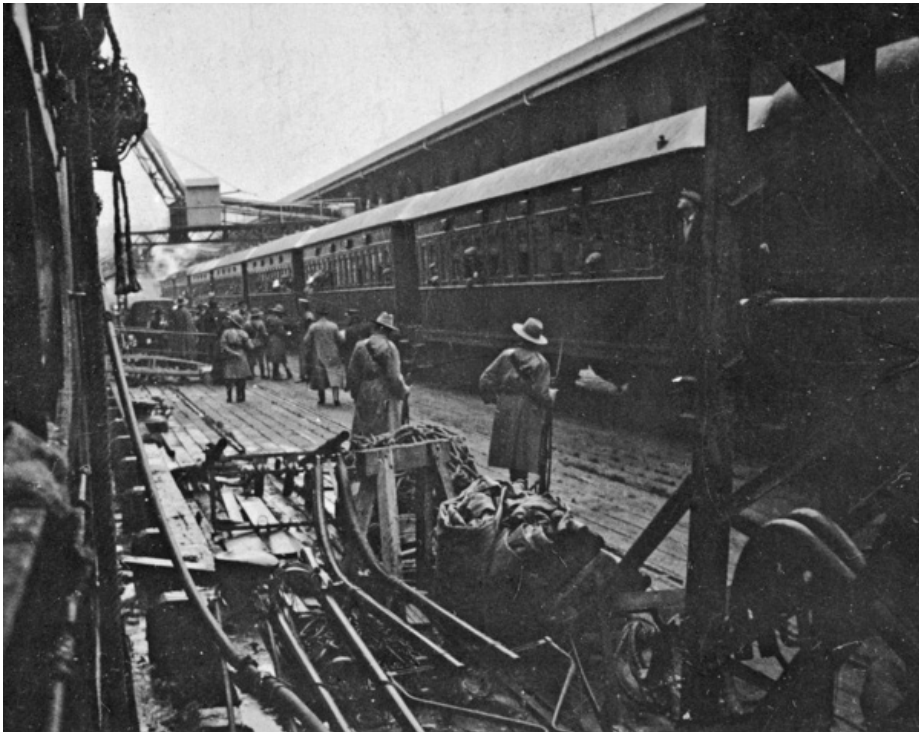


Figure 17.6 WWI image of the Goods Line being used to transport German deportees from Australian Concentration Camps (Source: Australian War Memorial H04144/C295775)

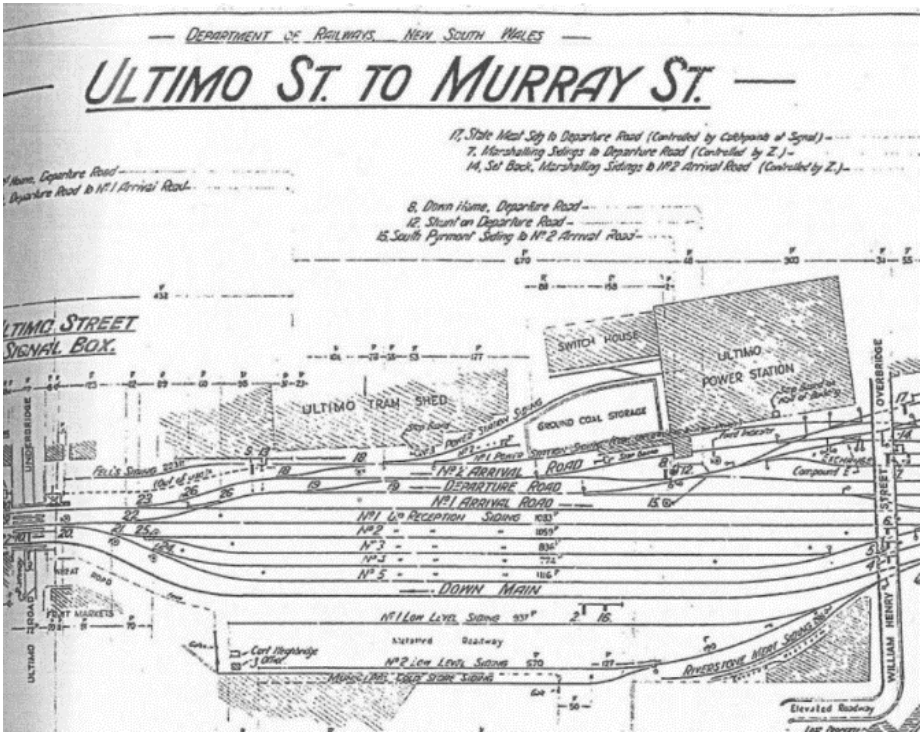


Figure 17.7 Section from Dept of Railways NSW, Ultimo St to Murray St signal diagram 18 June 1934 (Source: Australian Railway Historical Society NSW)

17.2 PHYSICAL ANALYSIS OF THE GOODS LINE

Remnant sections of the Goods Line track located within the site boundary of the Powerhouse Ultimo site extend along the eastern side of the site, entering the site in the southeast roughly parallel to the Harwood Building, with the track extending across the ground surface north through the Level 1 courtyard and ending at the southern façade of the Boiler House. The tracks are most evident when accessing the site from the east, either through the Goods Line walk from Darling Drive and Haymarket. The remnant tracks have been infilled with modern concrete and surfaces to make them flush with the existing ground surface.

17.3 HERITAGE SIGNIFICANCE

17.3.1 Statement of Significance

The Darling Harbour Rail Corridor (the Goods Line) is included on the State Heritage Inventory as it is listed on Property NSW’s (formerly SHFA) Section 170 Register as being locally significant. The Statement of Significance is as follows:

The Darling Harbour goods line was part of the first railway opened in New South Wales in 1855, the current corridor corresponds with that purchased from the Harris family in 1853 for this purpose. It therefore has a high degree of significance as a place. The Ultimo Road Bridge is believed to be constructed in the 1850s, and is therefore one of the only remaining features of the original railway which joined Darling Harbour and Granville (Parramatta Junction) in 1855. The siting of the railway along what was the edge of Darling Harbour strongly influenced the development of Pyrmont and Ultimo. Because of it, wool stores, engineering works and other industries were built here after the 1870s, giving this part of Ultimo its industrial, rather than residential, flavour. The site also contains two railway bridges. The Railway Square road overbridge (outside the curtilage of this listing) built in 1855 is historically significant as the oldest railway bridge to be constructed and still in use in New South Wales. It is a strong connection to the first railway construction and the original Redfern (Sydney) Station. The Ultimo railway underbridge is a mid 19th century construction with classic revival inspired cast iron columns and mid 19th century sandstock brick abutments. Both items are assessed individually as historically rare, scientifically rare, archaeologically rare and socially rare."

17.3.2 Grading of Significant Components

The key components and elements of the fabric and form of the Ultimo Power House have been ranked accordance to the Heritage NSW criteria for assessing significance, as summarised in Table 17.1 and depicted in Figure 17.11.



Figure 17.8 The Goods Line prior to development, the pedestrian overbridge connecting the Museum to the Monorail station is shown in the background) (Source: JBA, UPN Stage 2, DA Statement of Environmental Impacts, 2012)




Figure 17.10 Goods Line tracks visible in the ground along the Harwood Building (Source: Curio)



Figure 17.9 The Goods Line with garden leading to the level 1 courtyard (Source: Curio Projects)

Table 17.1 Grading of Significance for The Goods Line

ELEMENT	IMAGE	GRADING	NOTES
Remnant Rail lines		● HIGH	The rail lines that originally connected the Power House buildings to the goods line are of high significance.

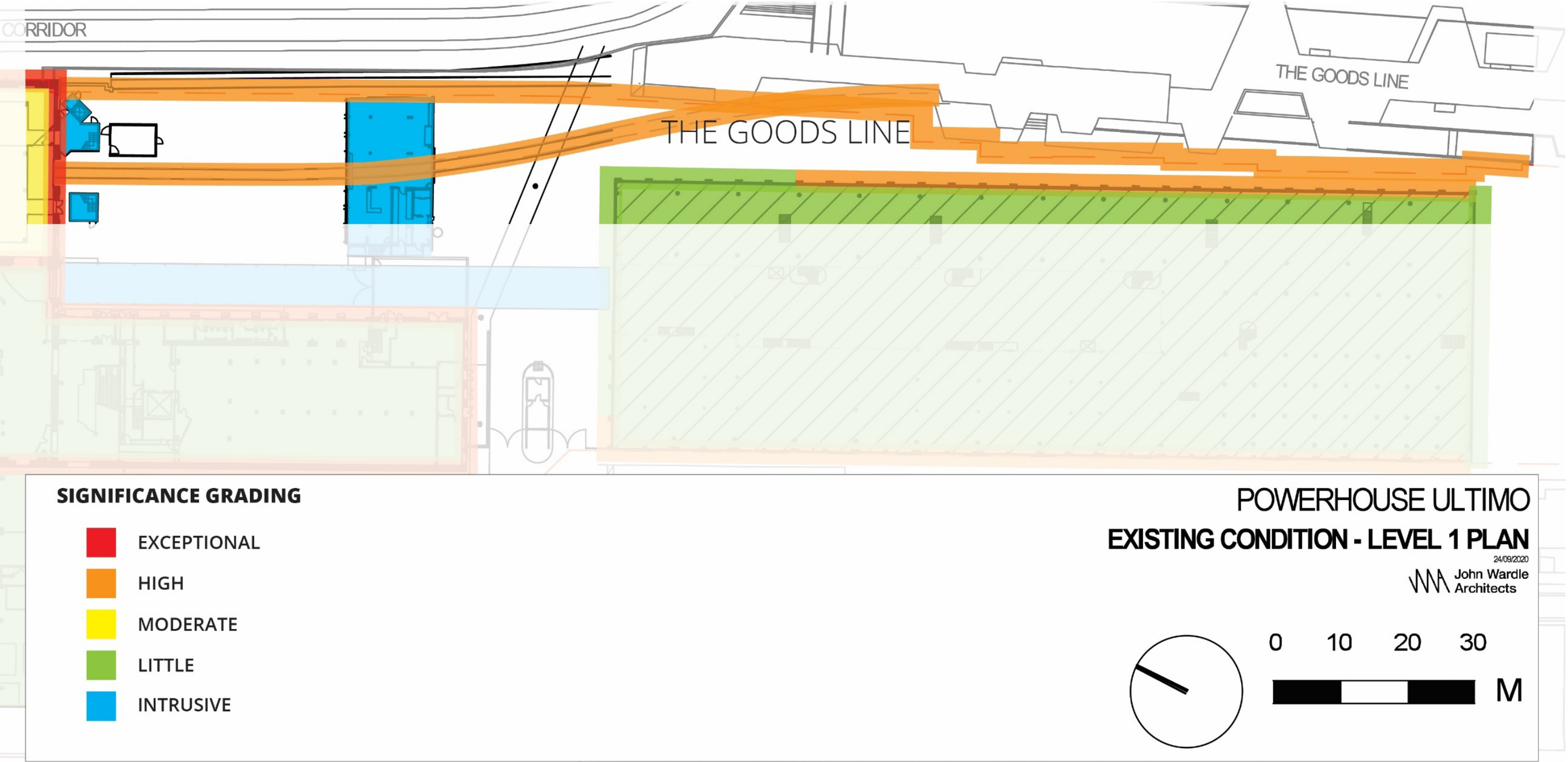


Figure 17.11 The Goods Line Grading of Significant Components

17.4 OPPORTUNITIES AND
CONSTRAINTS

Opportunities and Constraints specific to the section of the Goods Line located within the Powerhouse Ultimo site include:

- Opportunities**
- To explore the relationship of the Goods Line with the Power House
 - The Goods Line should be interpreted alongside the Harwood Building and Switch House through the Level 1 Courtyard leading into the Boiler House.
 - To connect museum with public domain.
 - To make historic connections between the Power House buildings and the Goods Line more legible.
 - Re-instate connectivity to surrounding areas including Chinatown, Darling Square and Darling Harbour.
 - Infrastructure opportunity for a new half court/ multi purpose court at the Goods Line/Powerhouse.¹²

17.5 ITEM-SPECIFIC
CONSERVATION POLICIES

Policy 18—Site access: new site access or improvements to connectivity to The Goods Line should consider options and solutions that will have a positive and neutral heritage impact.

17.6 PHOTO REGISTER FOR THE GOODS LINE

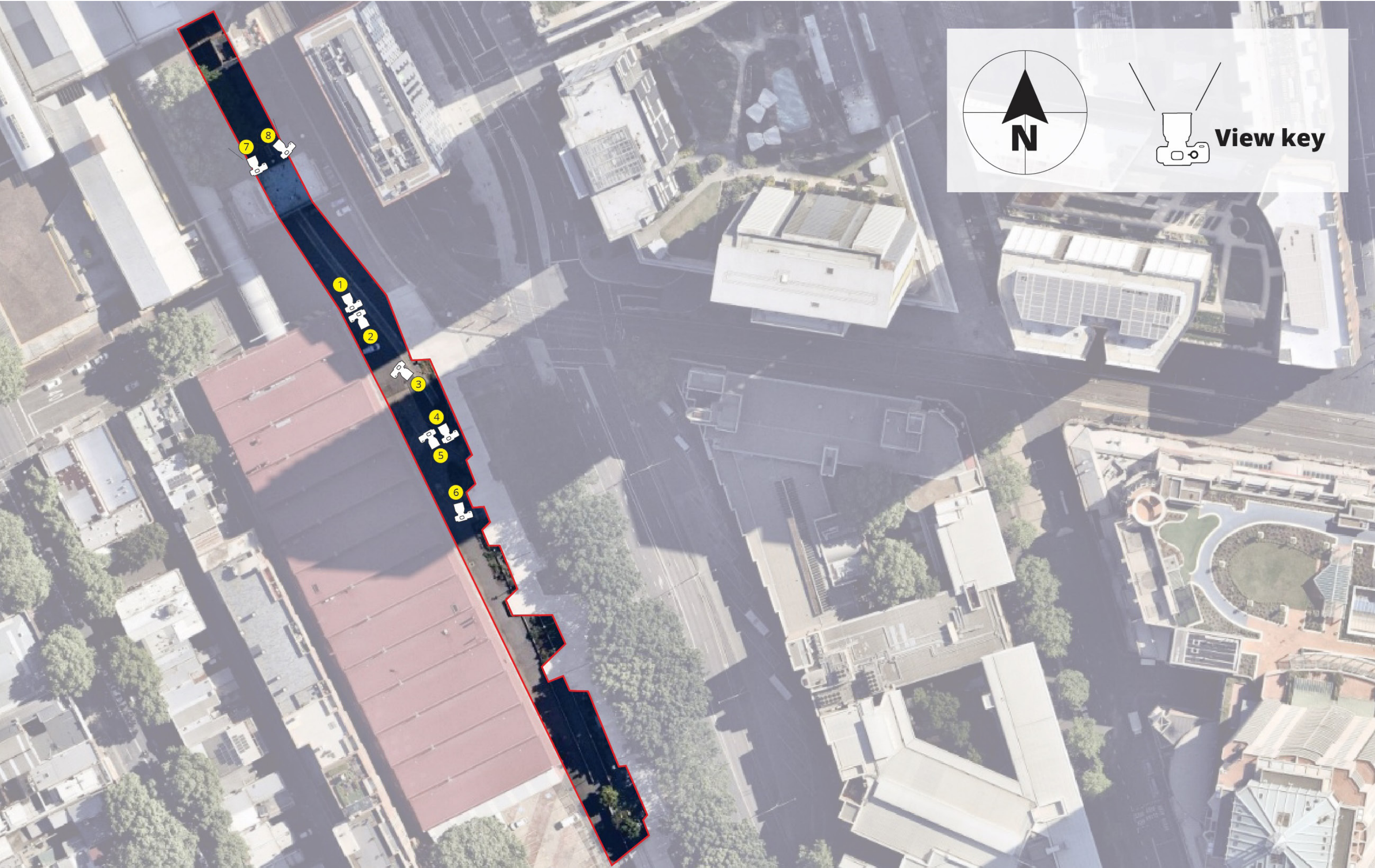


Figure 17.12 The Goods Line Photo Register



The Goods Line Viewpoint 1



The Goods Line Viewpoint 2



The Goods Line Viewpoint 3



The Goods Line Viewpoint 4



The Goods Line Viewpoint 5



The Goods Line Viewpoint 6



The Goods Line Viewpoint 7: Level 1 Courtyard



The Goods Line Viewpoint 8: Level 1 Courtyard

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8 Transport Heritage NSW, 'Sydney's Metropolitan Goods Line', Transport Heritage NSW (website), accessed January 2021, < <https://www.thnsw.com.au/post/sydney-s-metropolitan-goods-lines>>

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11 Sydney Harbour Foreshore Authority (Property NSW) Section 170 Register, Darling Harbour Rail Corridor

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**POWERHOUSE
ULTIMO**

**CONSERVATION
MANAGEMENT PLAN**

PART D

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APPENDIX A

Exterior Site Photos Register

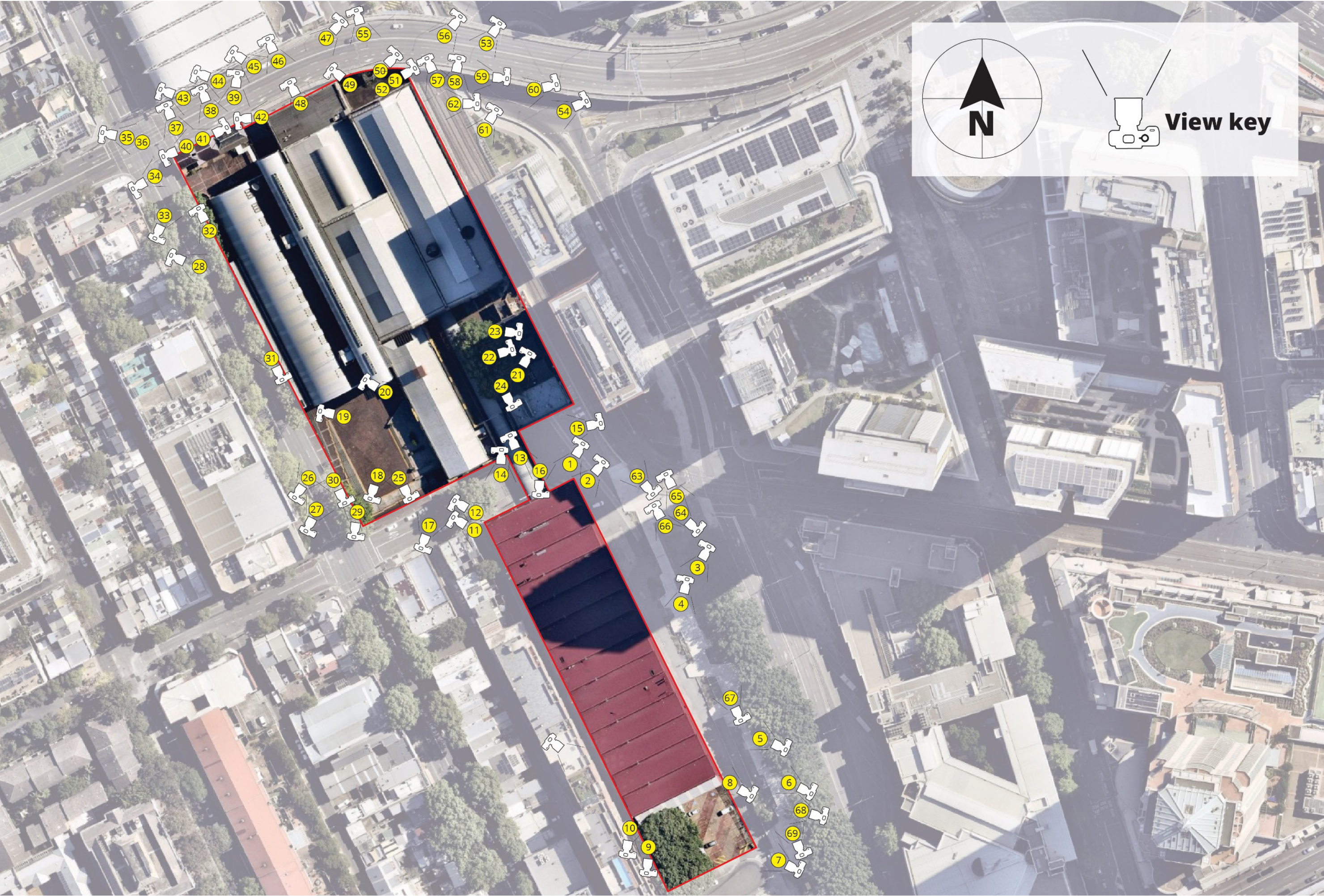


Figure 1.9 2020 view key map for Powerhouse Ultimo site (Source: Curio 2021)



Exterior Viewpoint 1



Exterior Viewpoint 2



Exterior Viewpoint 3



Exterior Viewpoint 4



Exterior Viewpoint 5



Exterior Viewpoint 6



Exterior Viewpoint 7



Exterior Viewpoint 8



Exterior Viewpoint 9