

11.1 HISTORY OF THE TURBINE HALL

The Turbine Hall was constructed in 1902 as a southern extension/addition to the Engine House (Figure 11.3). Originally referred to as the Engine House Extension, the Turbine Hall was initially constructed to house reciprocating engines and did not house turbines until 1905. Part of the original construction of the Turbine Hall included installation of the overhead travelling crane that remains in the Hall today.

The first steam turbine was installed in the Hall in 1905 - the 2,240kW Parson’s Steam Turbo Alternator (‘Turbine No. 6’) – prompting a requirement to also install an additional sixteen water tube boilers in the neighbouring Boiler House, which itself was extended at the time as a result (Figure 11.4). The rapid expansion of Sydney’s tramway system in the early 20th Century led to installation of two additional Parson’s turbines in 1909, and by 1910 the building was officially referred to as the Turbine Hall.’ By 1914, the Turbine Hall housed a total of seven turbine units, necessitating the removal of the original three reciprocating engines to make space for the new machinery. By 1918, the seven turbo-alternators could generate 36,000kW per hour.

Modernisation and remodelling of the Ultimo Power House between 1927 and 1931 involved replacement of many of the turbine units for improved efficiency and generating capacity (Figure 11.7), as well as the construction of the new Switch House building along the southern side of the Turbine Hall. Installation of the new turbines required some additional excavation below the Turbine Hall (Figure 11.6), particularly to accommodate the unit’s ancillaries. Construction of the Switch House in 1927 also required some alterations to some of the Turbine Hall southern façade windows to accommodate the new building. The modernisation works also included installation of a 60 ton crane in the Turbine Hall in 1930.²

Previous Names	The Engine Room Extension
Address	500 Harris Street, Ultimo
Lot & DP	Lot 1 DP631345
Built	1902
Heritage Listings	SHR 02045 “Ultimo Power House” LEP I2031, “Powerhouse Museum Former Warehouse Buildings, including interiors”
Non-Statutory Listings	Register of the National Estate (Powerhouse Museum (Stage Two), Place ID 100690) National Trust of Australia (NSW) Register (S11648, 24/10/2015)

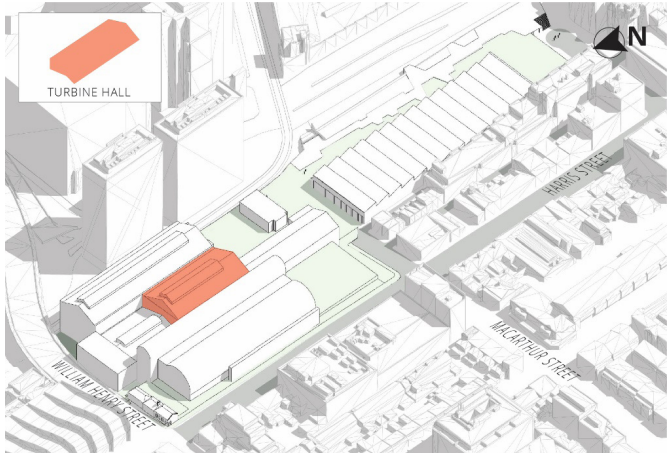


Figure 11.1 Location of the Turbine Hall. (Source: John Wardle Architects with Curio Projects overlay).



Figure 11.2 Current interior of the former Turbine Hall (Source: Powerhouse, 2022)

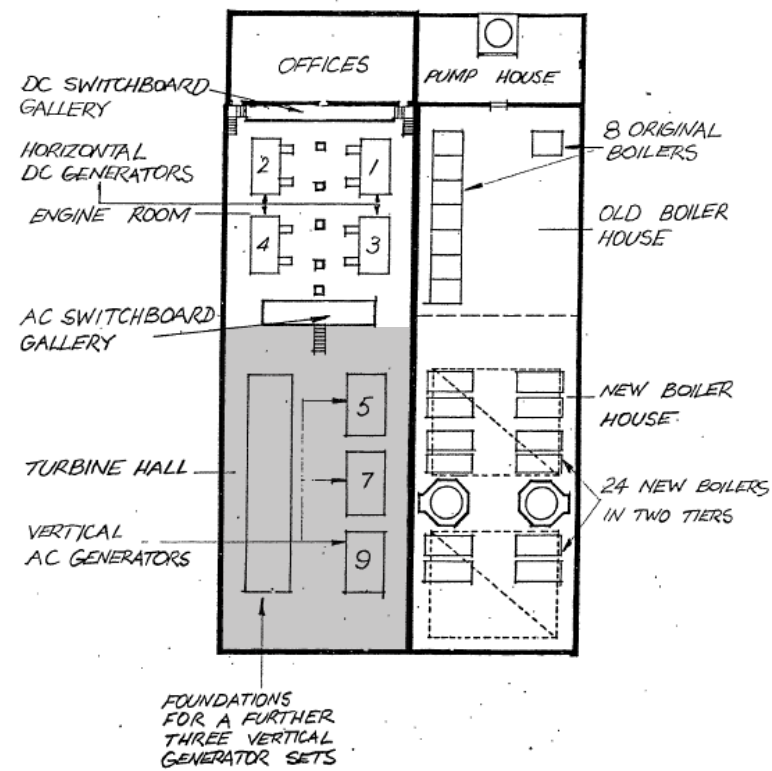


Figure 11.3: 1902 Layout of the Turbine Hall (Engine House southern extension) in grey (Source: Godden et al. 1984 p. 104)

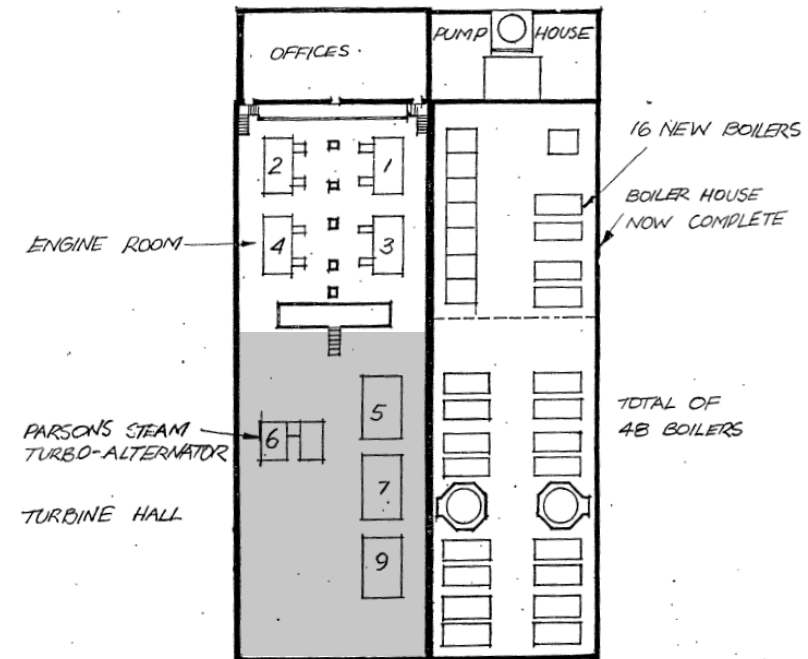


Figure 11.4: 1905 Layout of the Turbine Hall after installation of Parsons Steam Turbo Alternator (Source: Godden et al. 1984 p. 104)

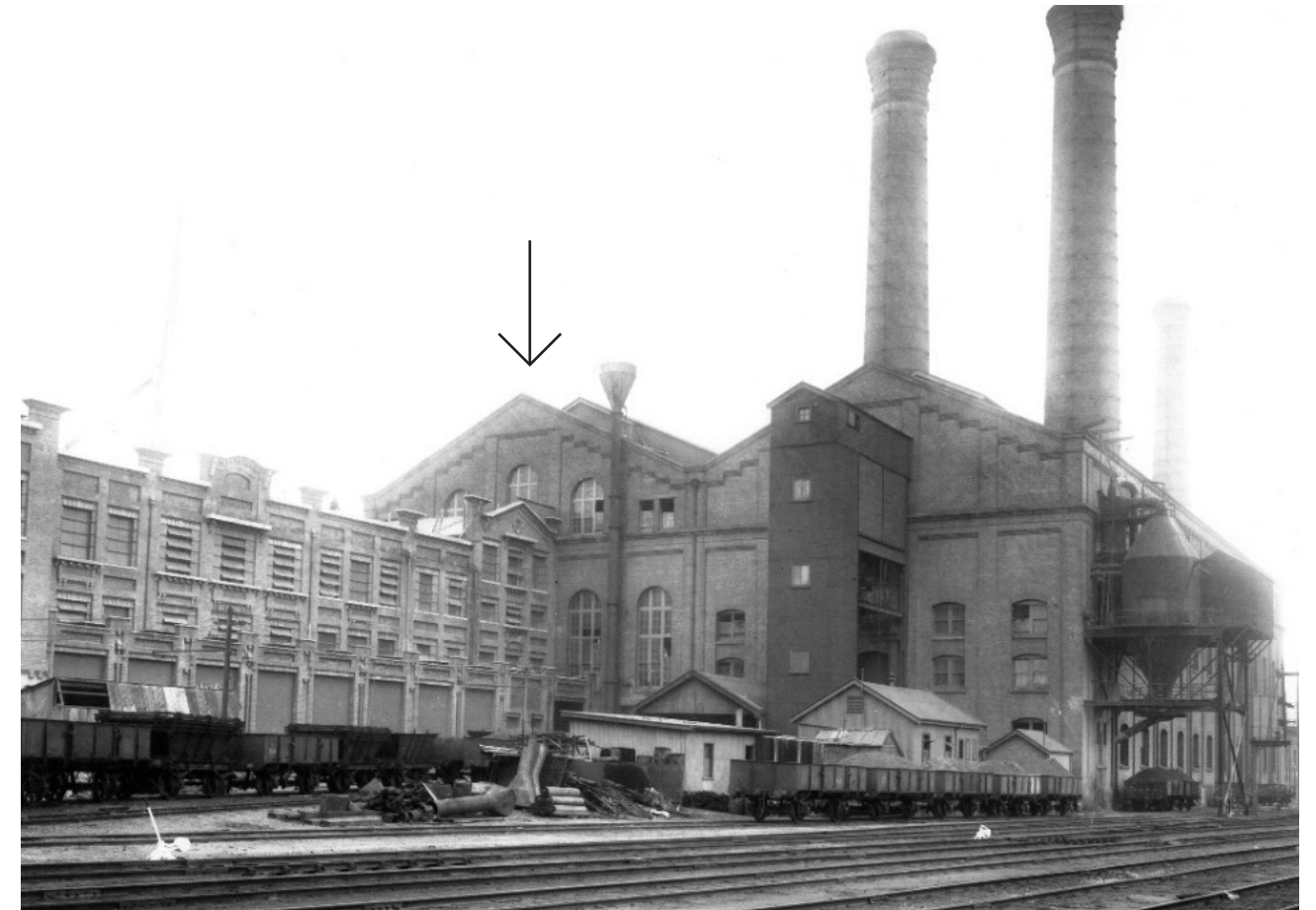


Figure 11.5 Location of Turbine Hall marked by arrow (Source: City of Sydney Archives)

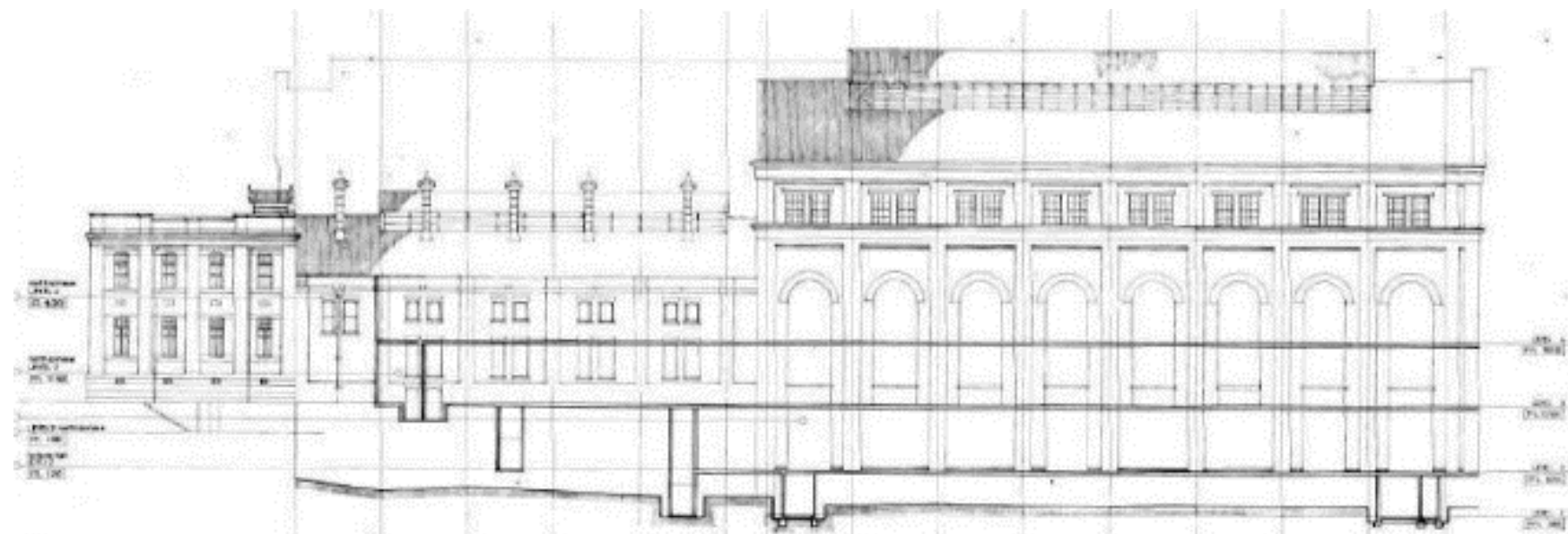


Figure 11.6 West section of the Ultimo Power House Buildings, North Annexe, Engine Hall and Turbine Hall (pictured left to right). The basement of the Turbine Hall is 3.2m deep. (Source: AMBS 2018, from 1984 Museum of Applied Arts and Sciences Construction plans)

When the Ultimo Power House closed on 11 October 1963, the Turbine Hall, along with the other Power House buildings, fell into disrepair and was subsequently damaged by decay, squatters, and vandals. The turbo alternators were removed from the Hall shortly after closure. In the early 1980s, works in the Turbine Hall in preparation for the adaptive re-use of the building for the Powerhouse Museum included removal of the majority of the interior features of the Hall (engine beds and bases, structures, and floors), such as removal of the concrete engine pads that had once supported the Parson's turbines, and their surrounding terracotta tiled walkways³ (Figure 11.10 and Figure 11.11). It was noted during the course of the 1980s works that little of the original 1902 Turbine Hall floor survived by this time, with many areas of the floor having been progressively repaired, upgraded and modified throughout the operation of the Power House to accommodate the various upgrades and replacements of equipment. The majority of the original tile wall in the Turbine Hall remained at the time of the 1980s works, with some general alterations and renewals along with equipment upgrade.⁴

The adaptive reuse of the Turbine Hall for the Powerhouse Museum included creation of three levels within the Hall, the design of which was divided between several designers—Level 2 and 3 designed by Powerhouse's in-house design team, while Level 4 was designed by museum designers Denton Corker Marshall.⁵ The construction of the new Wran Building in 1988 along the western side of the Turbine Hall enveloped the western façade of the building, making this façade an internal wall within the museum space. Other additions to the Turbine Hall as part of the 1980s museum fit out included construction of mezzanine levels, escalators, and various services and amenities (Figure 11.12).

As part of the Powerhouse Museum revitalisation project in 2011–2013, further changes to the Turbine Hall included the dismantling of the 1988 cube structure in the Turbine Hall (Figure 11.12), relocation of a glass lift from the Wran Building into the Turbine Hall (Figure 11.13), and replacement of the escalators with new eco-friendly models.⁶ Restoration works to the Turbine Hall's southern façade was undertaken in 2012–2013.⁷

In 2022, the Turbine Hall remains in use as exhibition spaces for the Powerhouse Museum.

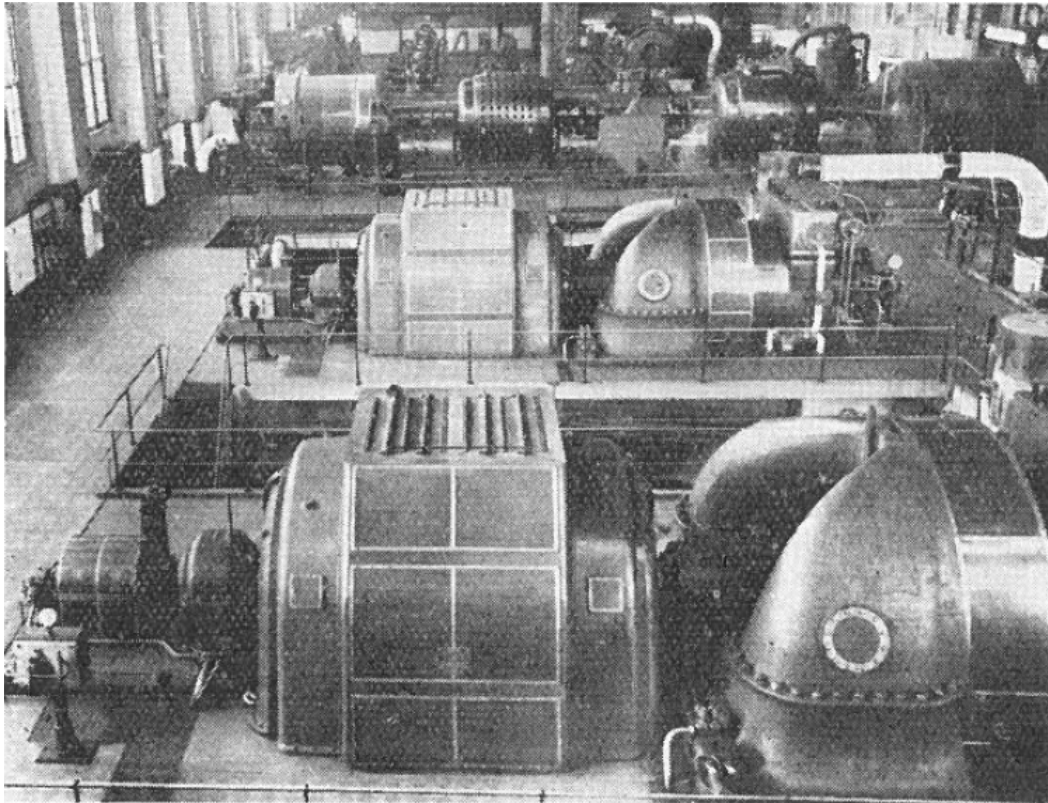


Figure 11.7 Interior of the Turbine Hall c.1933 (Source: Myers, 1933, p. 266)

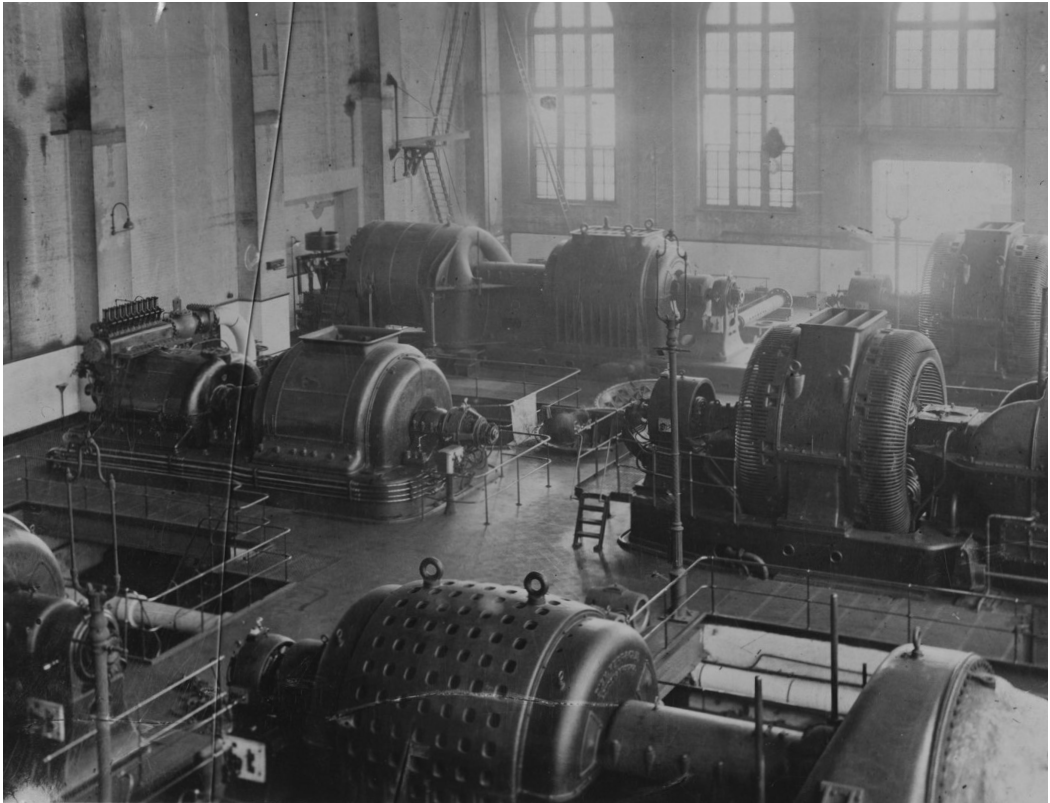


Figure 11.8 Interior of the Turbine Hall looking South, 1963 (Source: State Archives NSW NRS-21573-2-10-PR5322)

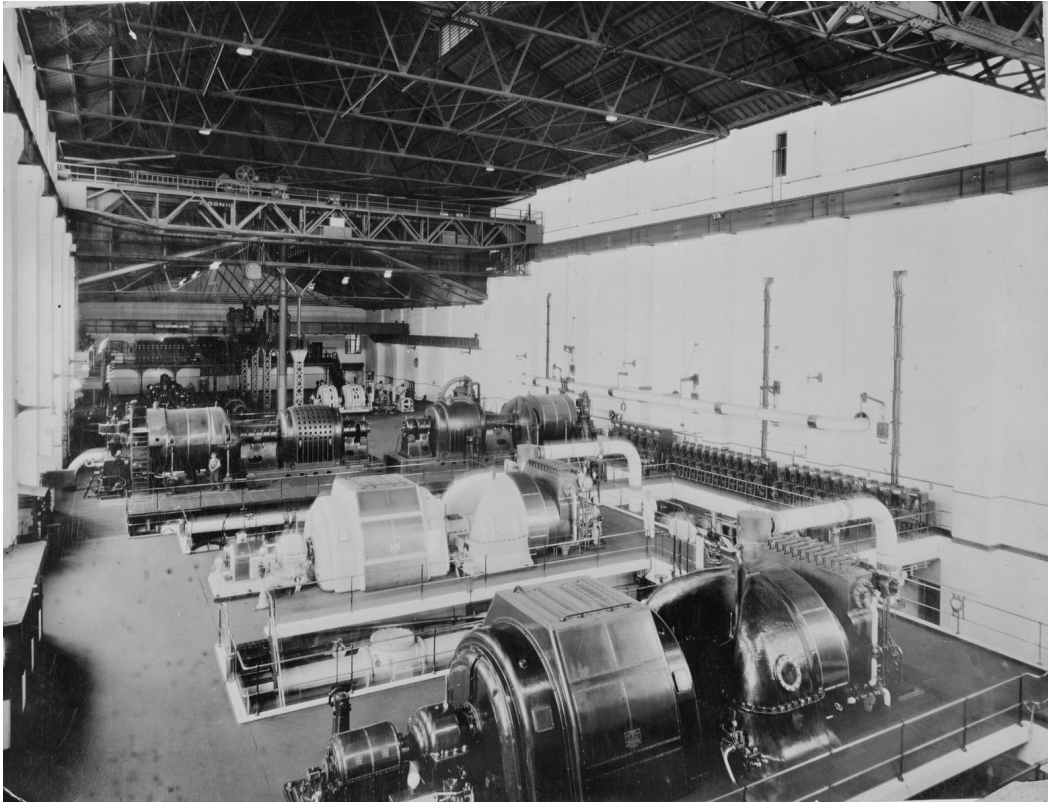


Figure 11.9 Interior of the Turbine Hall and Engine House looking North, 1963 (Source: State Archives NSW NRS-21573-2-10-PR5315)



Figure 11.10 Interior c. 1986 prior to the construction of the Powerhouse Museum (Robert Pearce- from SMH 6 Dec 2018)

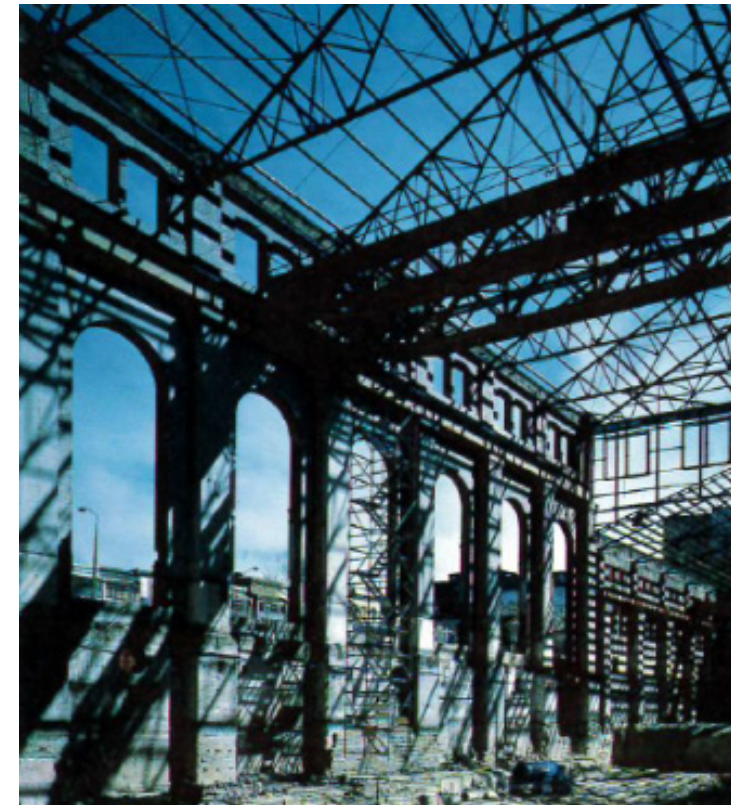


Figure 11.11 Turbine Hall and Engine House during Construction (Source: Design World 1988)



Figure 11.12 The Turbine Hall prior to Stage 1 of the Revitalisation Project (Source: Powerhouse)

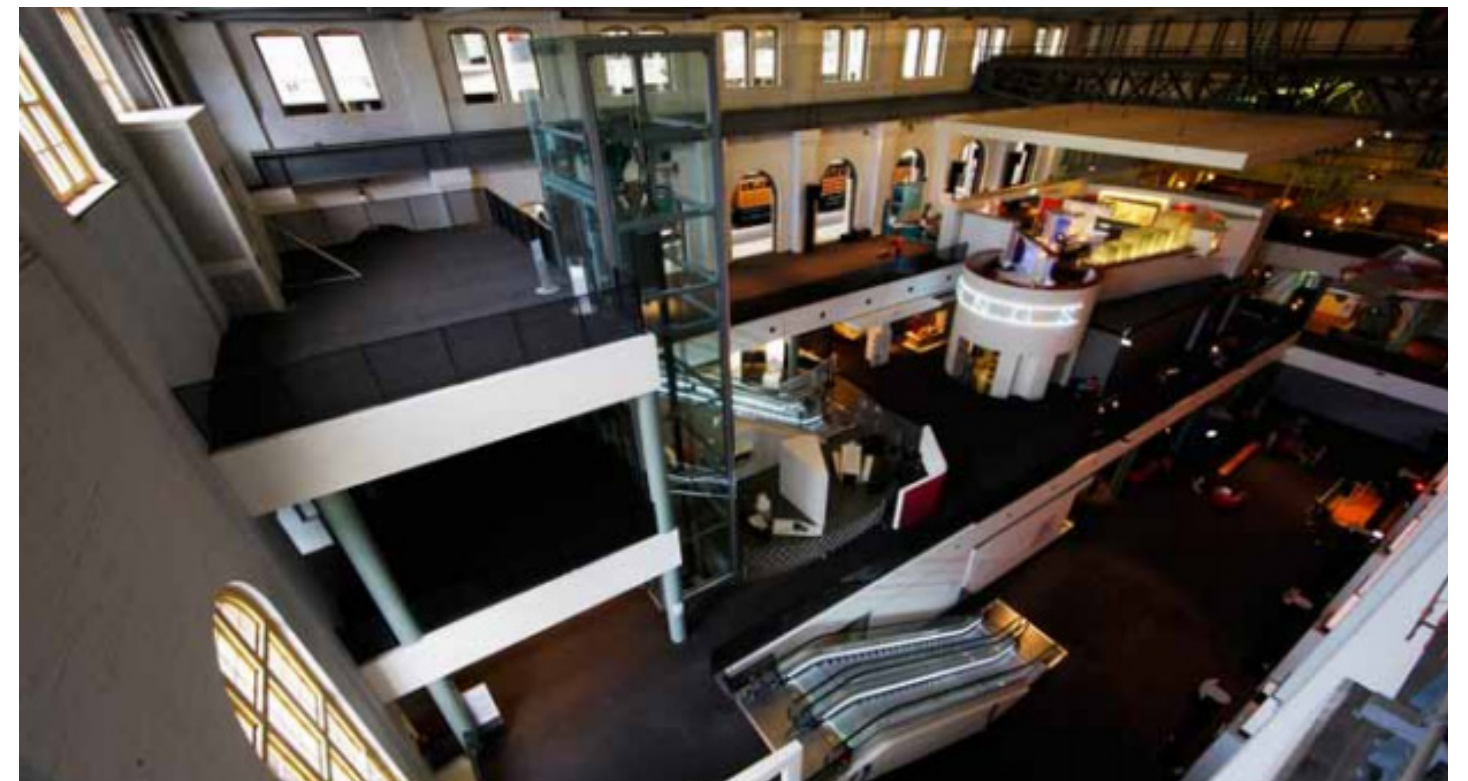


Figure 11.13 The Turbine Hall in 2012 following Stage 1 of the Revitalisation Project (Source: Powerhouse)

11.2 PHYSICAL ANALYSIS OF THE TURBINE HALL

An overall photo register and images of the Turbine Hall as of 2021 is presented in Section 11.6.

11.2.1 Site and Setting

The Turbine Hall forms part of the Powerhouse Ultimo Site at 500 Harris Street, Ultimo. Within the Powerhouse Ultimo site, the Turbine Hall is bordered to the north by the Engine House, along the east by the Boiler House, southeast by the Level 1 museum courtyard, south by the Switch House, and west by the Wran Building. As is the case for the Engine House, the Turbine Hall never had a street frontage.

11.2.2 Built Elements

The 1902 Turbine Hall measures 56m wide by 31m deep, and is a very simple, very strong expression of the utilitarian architecture of the early 20th Century and one of the prime large examples of Edwardian industrial architecture in Sydney. The SHR listing describes the Turbine Hall as:

The façade is divided into eight bays which are further proportioned by a horizontal band which divides the façade into sixteen elements. The west facade’s principal quality is its sheer scale which is enhanced by very carefully controlled simplicity. Emphasising the main articulation of the facade is a moulded stone stringcourse at the sill level of the upper windows and a moulded stone cornice capping the top of the parapet. The main elements are the very tall, semi-circular headed windows. These main windows have stone sills and the window bays, flanked by pilasters, terminate in stepped brick corbels and are surmounted by a stone gable cornice. The overhead Goninan gantry crane that served the Turbine Hall is still in place, complete with the high-level rails along which it ran.⁸

The exterior of the Turbine Hall remains relatively intact, and retains a prominent roof monitor as per the original design (although modified and reconstructed during 1980s works). Like the Engine House, the Turbine Halls’ one original external (western) façade has become an internal wall of the museum following the construction of the 1988 Wran Building. The upper section of the southern façade faces the Museum Level 1 courtyard located to the southeast of the building.

The Turbine Hall is notable for its sheer size, particularly its height and volume, which is an important architectural feature that reflects the size of machines the building was designed to house. While the Turbine Hall currently consists of three levels (constructed as part of the 1980s adaptive reuse of the site for the Powerhouse Museum), the overall volume and space of the building has mostly been retained and remains readable, particularly in the eastern side of the building (Figure 11.14). Some original wall tiles remain along the eastern interior wall. The pump of the Water Cooling System and Manifold is located in the basement of the Turbine Hall (this item is discussed in further detail in Part C: Section 16). At the time of site inspection in 2021, museum exhibitions and collections had been removed from the Turbine Hall, leaving the modern fit out works and extant structure only.



Figure 11.14 Interior of the Turbine Hall 2020 (Source: Powerhouse)



Figure 11.15 Turbine Hall western façade, now integrated as an internal wall within the Museum (Source: Powerhouse)

11.3 HERITAGE SIGNIFICANCE

The Turbine Hall, as part of the Ultimo Power House, is included within the following statutory heritage register listings:

- State Heritage Register (NSW), The Ultimo Powerhouse, SHR 02045, gazetted 04 Sep 2020.
- Sydney LEP 2012, The Powerhouse Museum Former Warehouse Buildings, including interiors, I2031.

The Turbine Hall is also included on two non-statutory registers; the Register of the National Estate Powerhouse Museum (Stage Two) (Listing 100690); and the National Trust (NSW) Register Powerhouse Museum (Stage Two) (S11648).

11.3.1 Summary of Significance—Turbine Hall

The former Ultimo Power House is historically significant as the first state-owned, large electricity generating station constructed in Sydney. Built in 1899, it was the first power station constructed to provide electricity for Sydney’s “new” electric tram system. As one of the early Power House buildings the Turbine Hall is part of one of the most important and intact group of power station buildings in the State. The Turbine Hall has historical significance as one of Sydney’s earliest buildings constructed with large unsupported spans, and the immense, internal volume of the Turbine Hall is aesthetically significant for its ability to convey the scale of the original Power House buildings. The exterior of the Turbine Hall is relatively intact whilst the majority of the interior was removed with the 1988 adaptive reuse of the building.

11.3.2 Views

Similar to the Engine House, the Turbine Hall never had a street frontage, and was always located behind buildings on Harris Street. Construction of the Wran Building in the 1980s enclosed the Turbine Hall’s western façade as an internal wall within the museum space. The eastern side of the southern wall of the Turbine Hall is open to the Level 1 courtyard, however is mostly concealed by the courtyard café and the modern covered walkway connecting the former Power House buildings to the Harwood Building in the south (Figure 11.16). Removal of these visually obstructive elements would improve views of the Turbine Hall from within the site, particularly from the Level 1 courtyard, and from the Macarthur Street/Goods Line entry to the Powerhouse Museum.




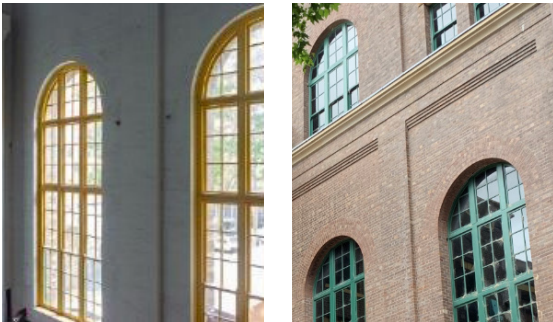
11.3.3 Grading of Significant Components




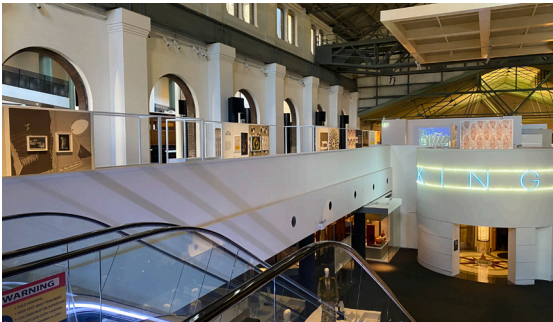

The key components and elements of the fabric and form of the Turbine Hall have been ranked accordance to the Heritage NSW criteria for assessing significance, as summarised in Table 11.1 and depicted in Figure 11.17 to Figure 11.22.

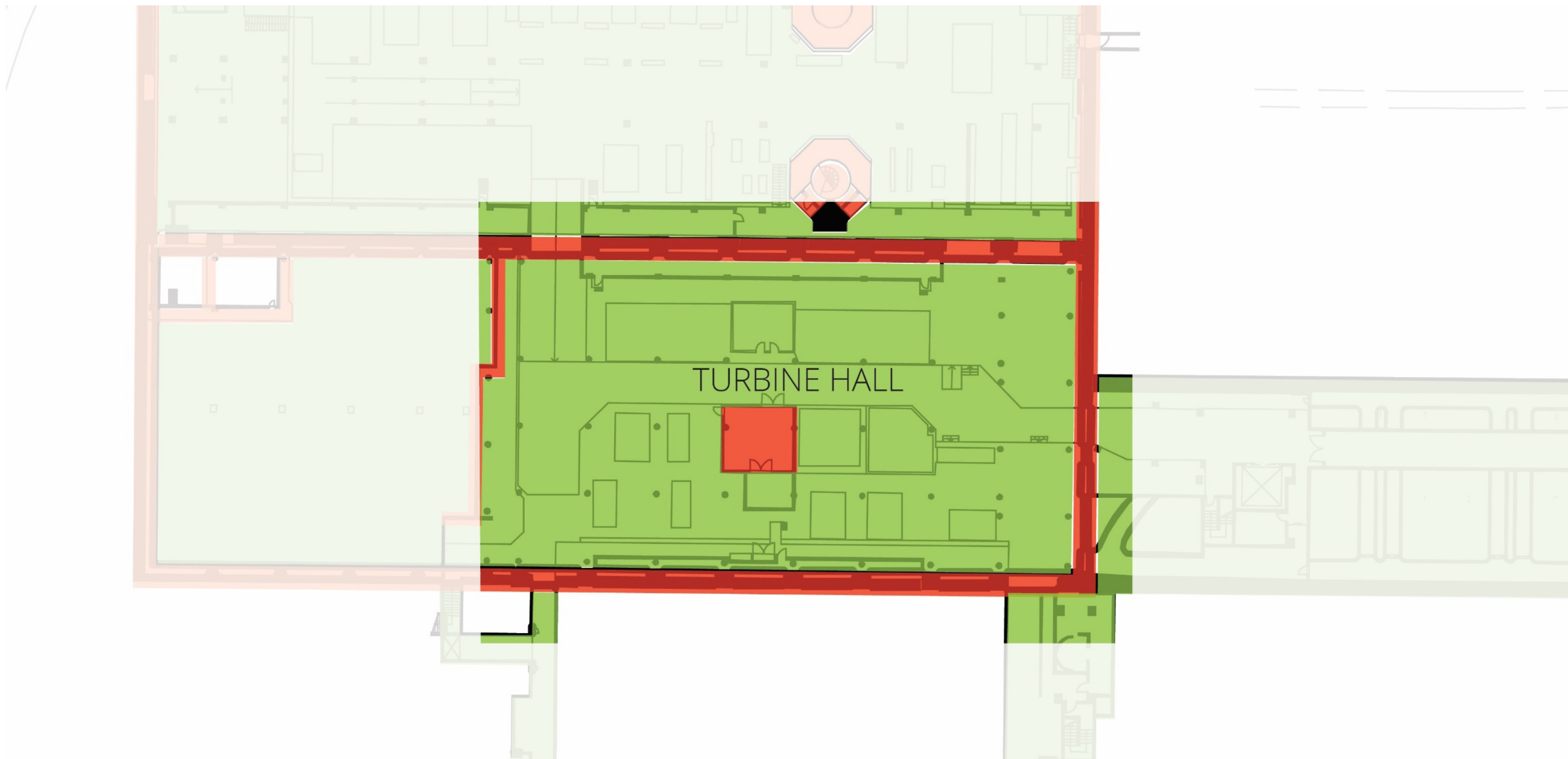


Figure 11.16 View north across the Powerhouse Ultimo Site. Turbine Hall in centre, concealed by the Switch House, and modern constructions (Level 1 courtyard café and covered walkway) (Source: Powerhouse)

Table 11.1 Grading of Significance for the Turbine Hall

ELEMENT	IMAGE	GRADING	NOTES
Roof Finish		● HIGH	While modified and replaced during the 1980s museum adaptive reuse, the prominent roof monitor roof finish is consistent with and representative of the original design of the roof, and is of high significance.
Roof Structure		● EXCEPTIONAL	The roof structure is original and of exceptional significance.
External Façade and Walls (Original)		● EXCEPTIONAL	<p>The original walls of the Turbine Hall are original fabric of the building, and highly intact with only minor modifications.</p> <p>While the original western external façade has been integrated into the 1988 adaptation for the Powerhouse Museum, including some modifications to existing windows and doorway arches to connect with the Wran Building, the façade remains predominantly intact and of exceptional significance.</p>
Windows (Original)		● EXCEPTIONAL	The tall semi-circular headed windows with stone sills are one of the main original elements of the Turbine Hall and are of exceptional significance.
Windows (Later additions)		● MODERATE	Some of the windows along the southern facade were altered to allow the switch house to abut the building.

ELEMENT	IMAGE	GRADING	NOTES
Floor		● HIGH	Any remains of original flooring beneath existing floor structures and coverings would be of moderate to high significance dependent on extent, integrity and intactness. Godden et al refer to terracotta tiles in the Turbine Hall, yet mentions it was predominantly destroyed by the time of the 1980s works. ⁹
Floor Coverings		● LITTLE	Modern floor coverings including carpet tiling etc date to the 1980s and are of little significance.
Escalator		● LITTLE	The escalator is modern and of little significance. IMAGE TO BE UPDATED
Mezzanine Levels		● LITTLE	The mezzanine levels are modern and of little significance. IMAGE TO BE UPDATED
Wall Tiles		● EXCEPTIONAL	The wall tiles in the Turbine Hall, particularly along the eastern interior wall, are part of the original fabric of the building (albeit repaired over time during the operation of the Power House) and are of exceptional significance.



SIGNIFICANCE GRADING

- EXCEPTIONAL
- HIGH
- MODERATE
- LITTLE
- INTRUSIVE

POWERHOUSE ULTIMO EXISTING CONDITION - BASEMENT PLAN

24/09/2020
John Wardle
Architects

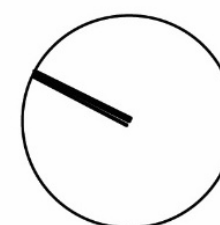
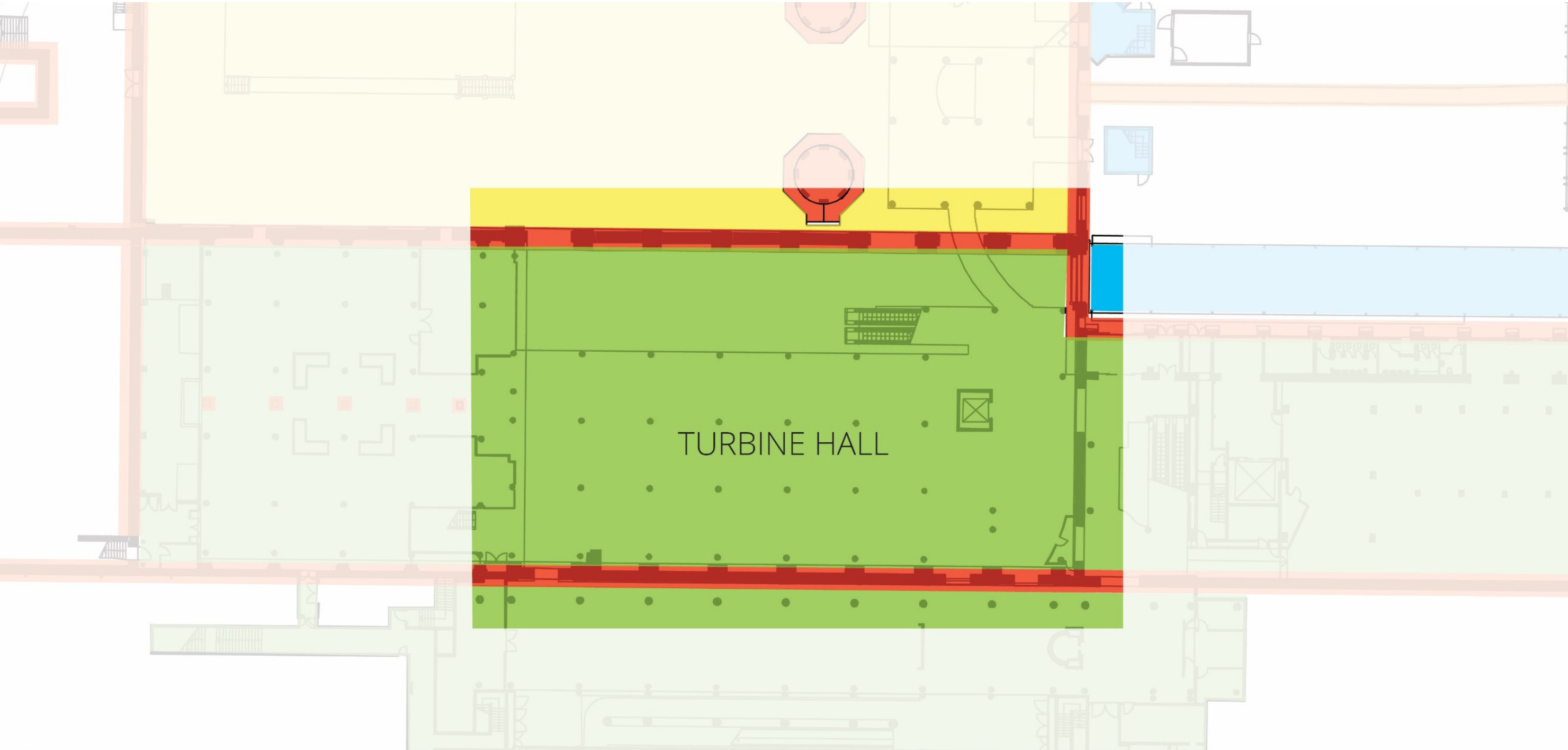


Figure 11.17 Turbine Hall Grading of Significance (Basement) NB: Exceptional component shown in this figure is the Water Cooling System and Manifold pump, assessed separately in the relevant section below of Part C (Source: John Wardle Architects plan with Curio Projects overlay)



SIGNIFICANCE GRADING

- EXCEPTIONAL
- HIGH
- MODERATE
- LITTLE
- INTRUSIVE

**POWERHOUSE ULTIMO
EXISTING CONDITION - LEVEL 1 PLAN**

24/09/2020
 John Wardle
 Architects



Figure 11.18 Turbine Hall Grading of Significance (Level 1) (Source: John Wardle Architects plan with Curio Projects overlay)

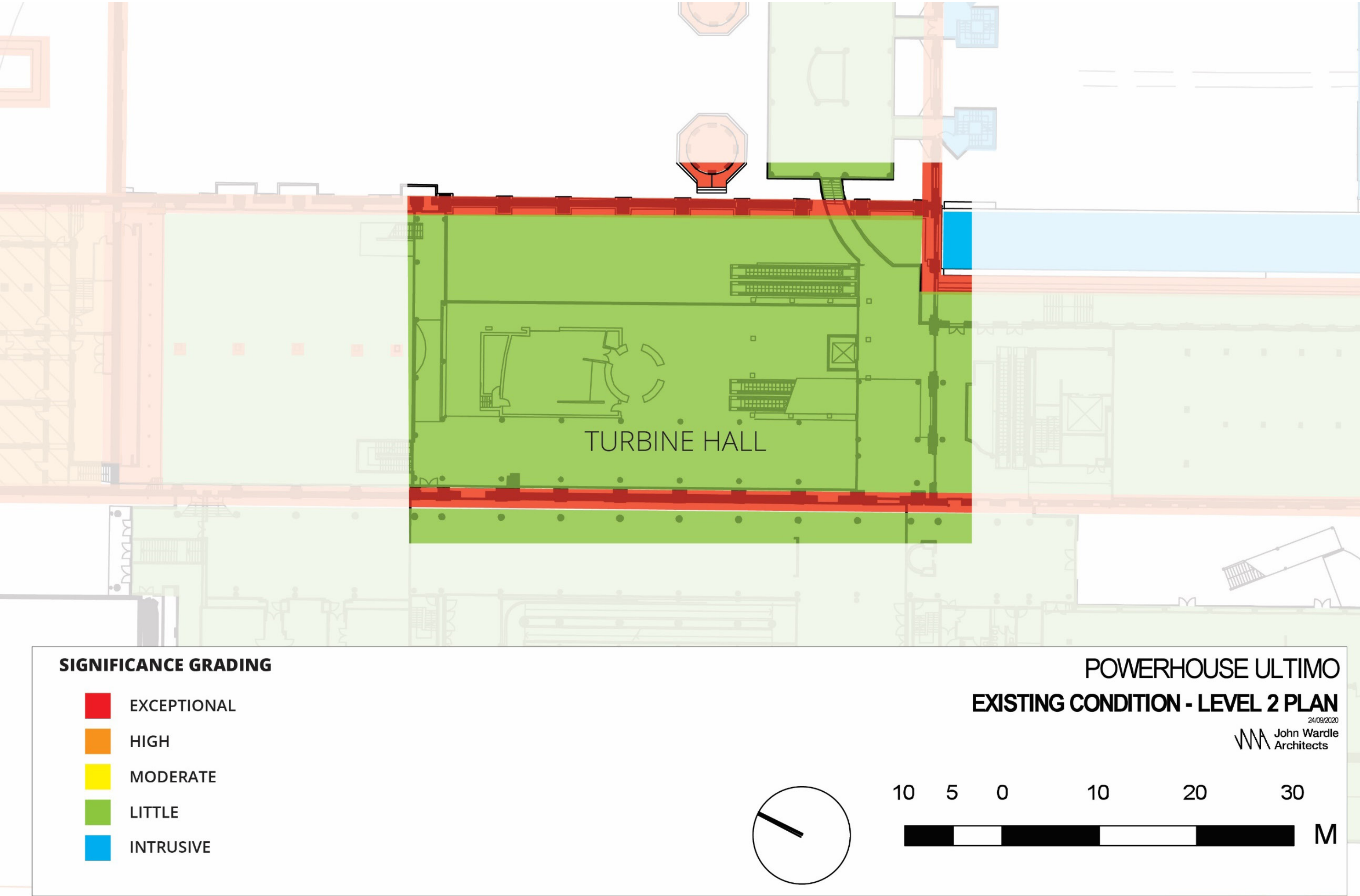


Figure 11.19 Turbine Hall Grading of Significance (Level 2) (Source: John Wardle Architects plan with Curio Projects overlay)

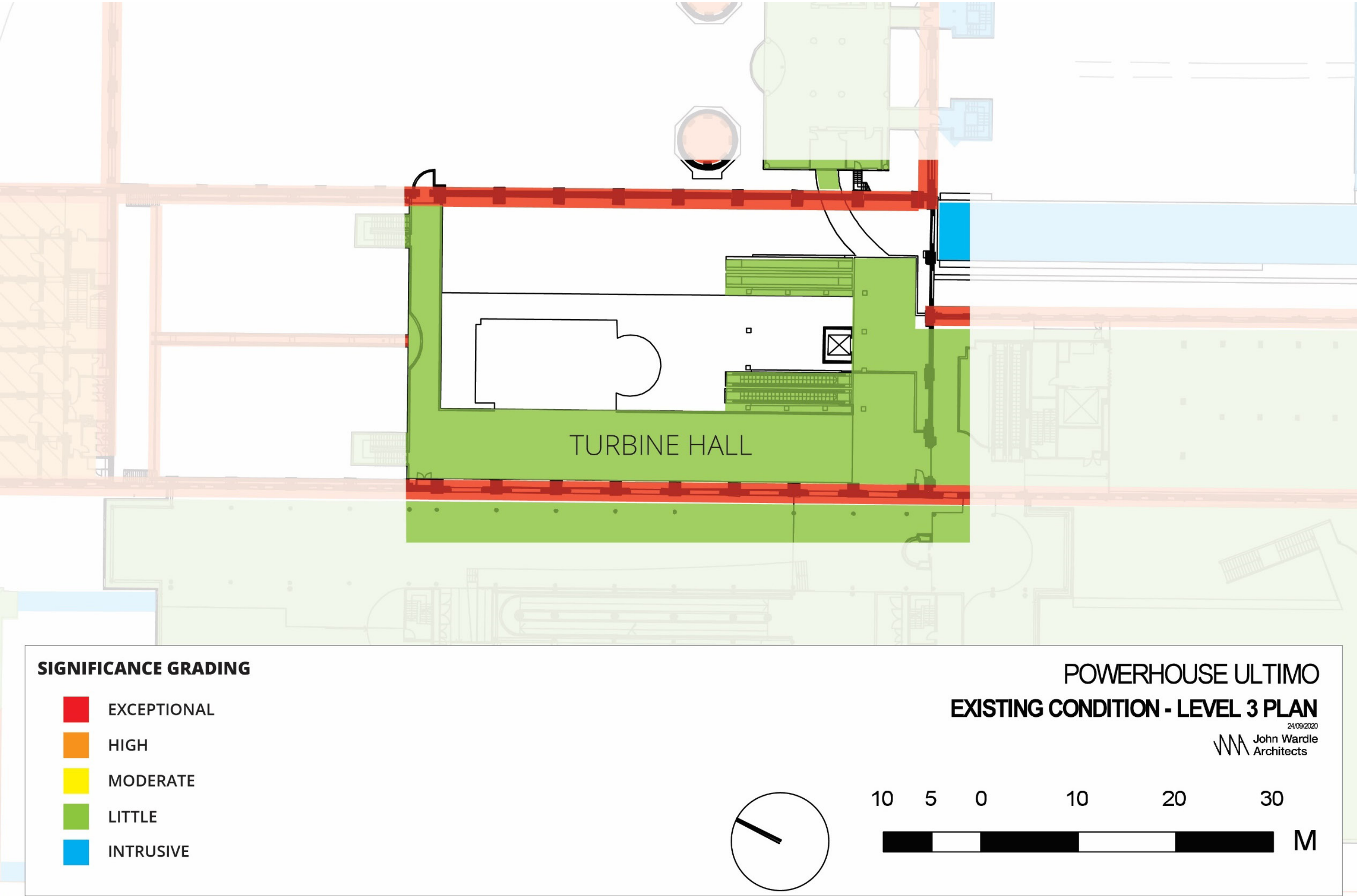


Figure 11.20 Turbine Hall Grading of Significance (Level 3) (Source: John Wardle Architects plan with Curio Projects overlay

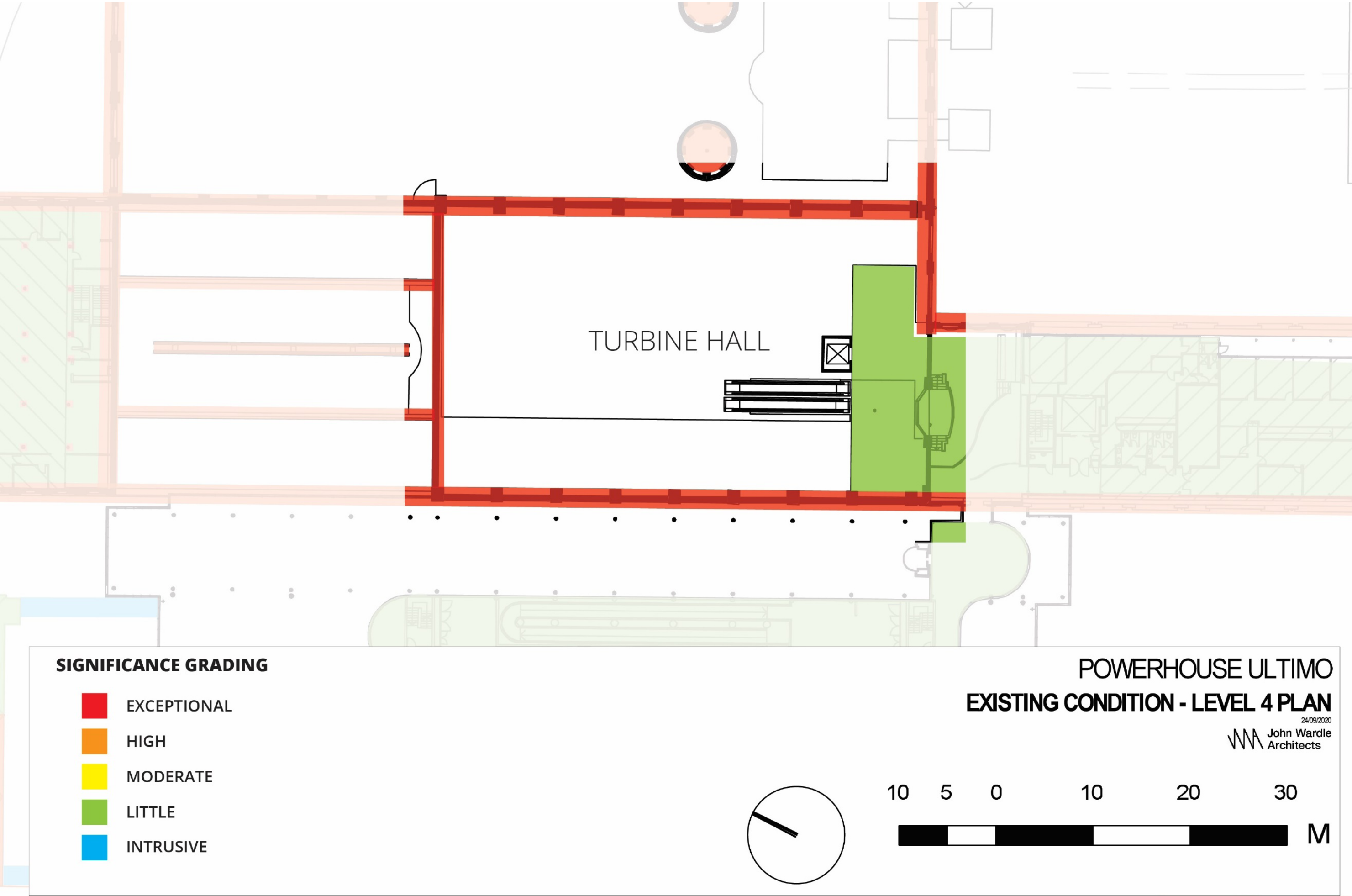


Figure 11.21 Turbine Hall Grading of Significance (Level 4) (Source: John Wardle Architects plan with Curio Projects overlay

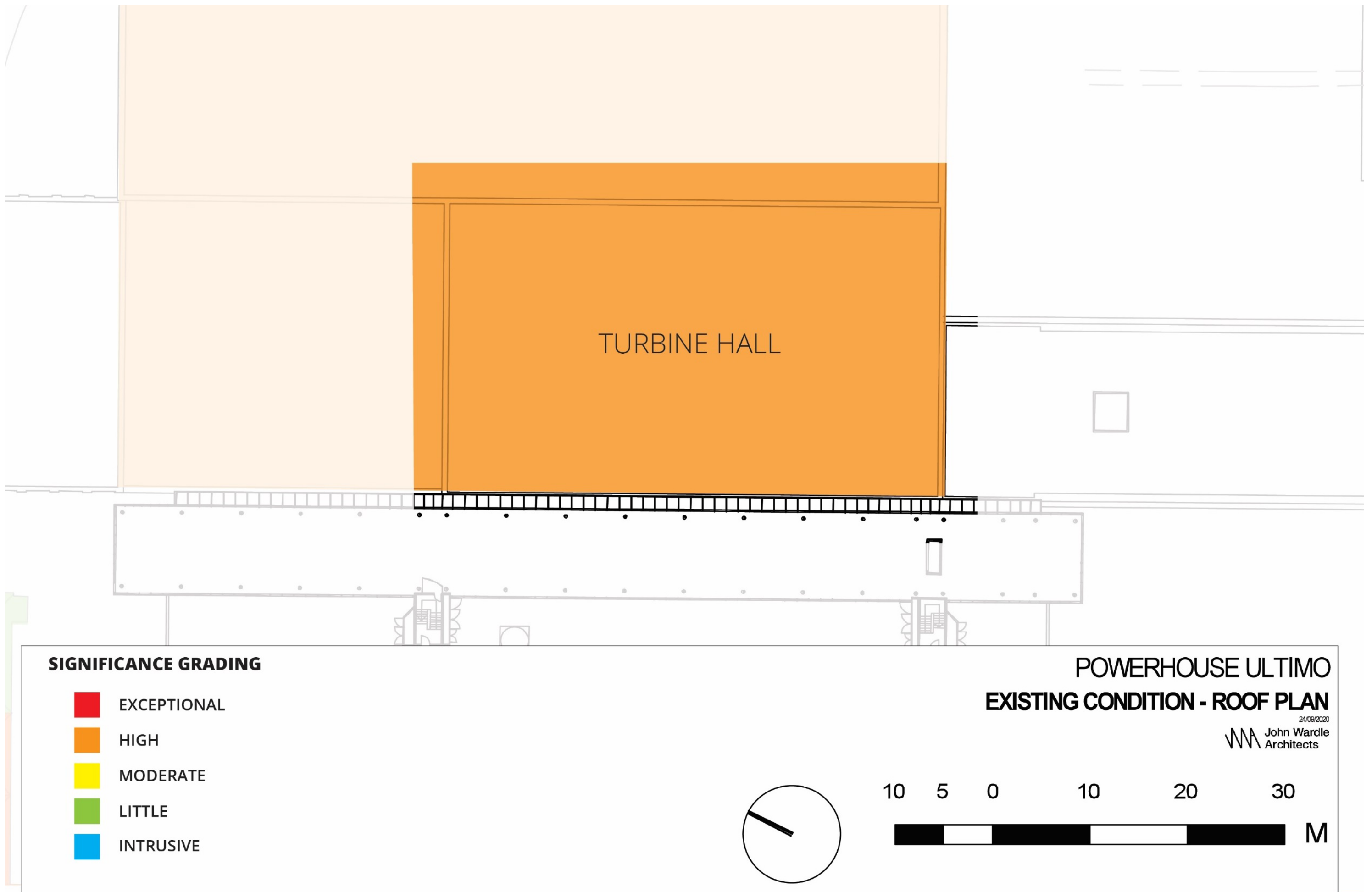


Figure 11.22 Turbine Hall Grading of Significance (Roof) (Source: John Wardle Architects plan with Curio Projects overlay)

11.4 OPPORTUNITIES AND CONSTRAINTS

Opportunities and constraints specific to the Turbine Hall include:

- Opportunities**
- To improve the industrial legibility and scale of the space by removing mezzanine incursions.
 - Interpretation of the history and former use of the Turbine Hall as part of the Ultimo Power House.
 - The connectivity between the Wran Building to the west, and the Boiler House in the right, via the Turbine Hall, has contributed to the exhibition parts of the Turbine Hall having a feel of a slightly transient space/a passageway to other parts of the museum. There is the opportunity to enhance and make more legible the individual space of the Turbine Hall by exploring options for future use of the Hall that make the space dominant in its own right (e.g. as has been done for the Tate Modern Turbine Hall, Casula Powerhouse, see Figure 11.23 to Figure 11.25), and supporting use for large scale exhibitions.

- Constraints**
- It is important to retain the feeling of space and readability of the open architectural volume of the Turbine Hall. Any activity that would require closing in the open roof plan (i.e. such as a false ceiling) would have a detrimental visual and physical impact on the significance of the building and would not be compatible or consistent with the remnant significant fabric and space
 - Additional penetrations between the Turbine Hall and the Boiler House should be avoided, traditional access routes should be retained and used.

11.5 ITEM-SPECIFIC CONSERVATION POLICIES

Policy 5—Buildings and Structures: The readability and presentation of the interior open space of the Engine House, Turbine Hall, and Boiler House is a significant feature of these former Power House buildings, and should be retained.

Policy 15—Compatible Use: Any activity in the open spaces of the Turbine Hall that would require closing in the open roof plan (i.e. such as a false ceiling), would have a detrimental visual and physical impact on the significance of the building and would not be compatible or consistent with the remnant significant fabric and space unless for a temporary exhibition, installation or event.

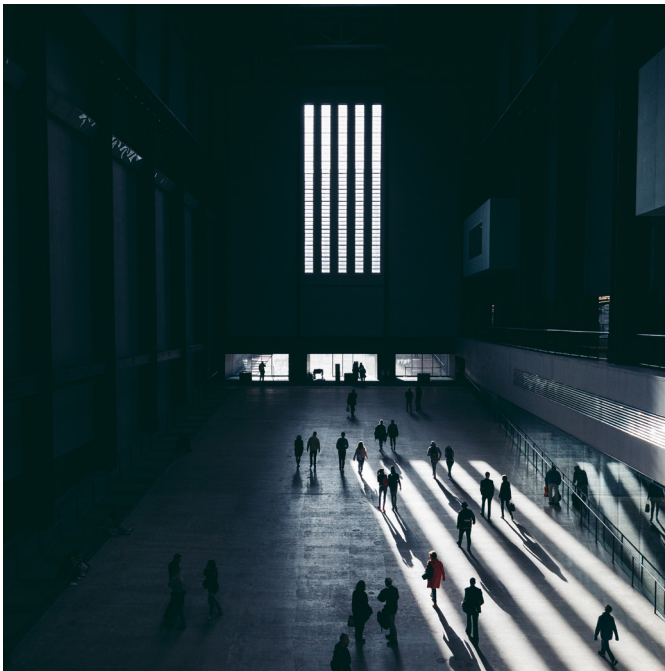


Figure 11.23 Tate Modern Turbine Hall (Source: Tom Eversley - stock.adobe.com)

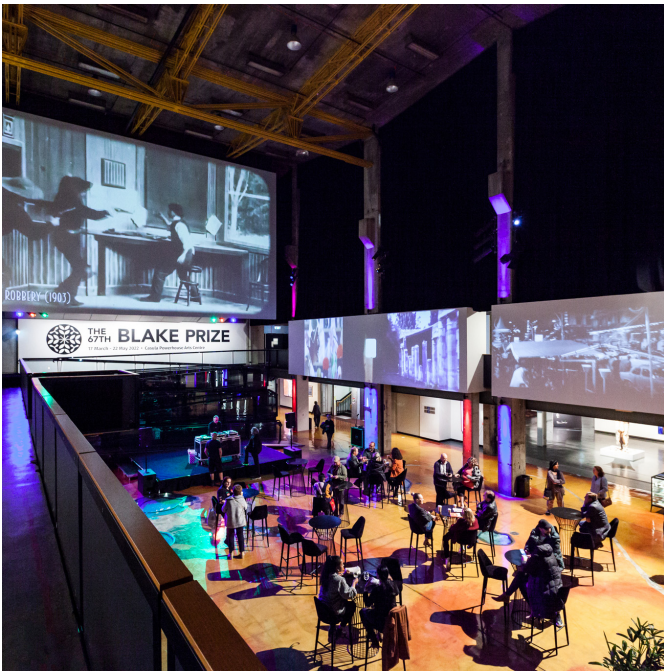


Figure 11.24 Casula Powerhouse Turbine Hall (Source: Chantal Bann)



Figure 11.25 View from the Wran Building through the Turbine Hall to the Boiler House, with a feel of a more transitory space that detracts from the ability of visitors to appreciate the Turbine Hall as a significant space in its own right (Source: Powerhouse)

11.6 PHOTO REGISTER FOR THE
TURBINE HALL

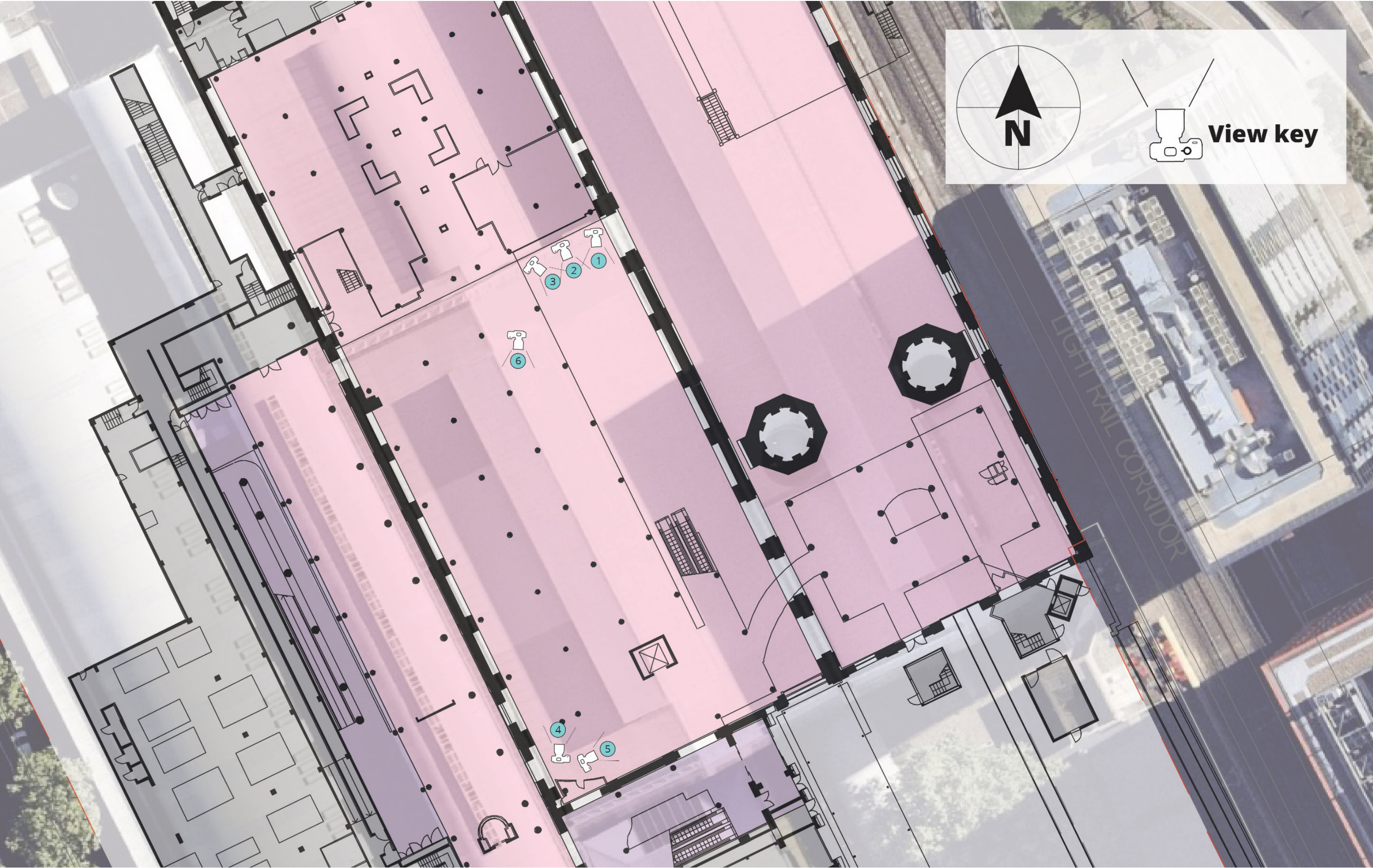


Figure 11.26 Turbine Hall Photo Register (Level 1)



Turbine Hall Viewpoint 1: Level 1



Turbine Hall Viewpoint 2: Level 1



Turbine Hall Viewpoint 3: Level 1



Turbine Hall Viewpoint 4: Level 1



Turbine Hall Viewpoint 5: Level 1



Turbine Hall Viewpoint 6: Level 1

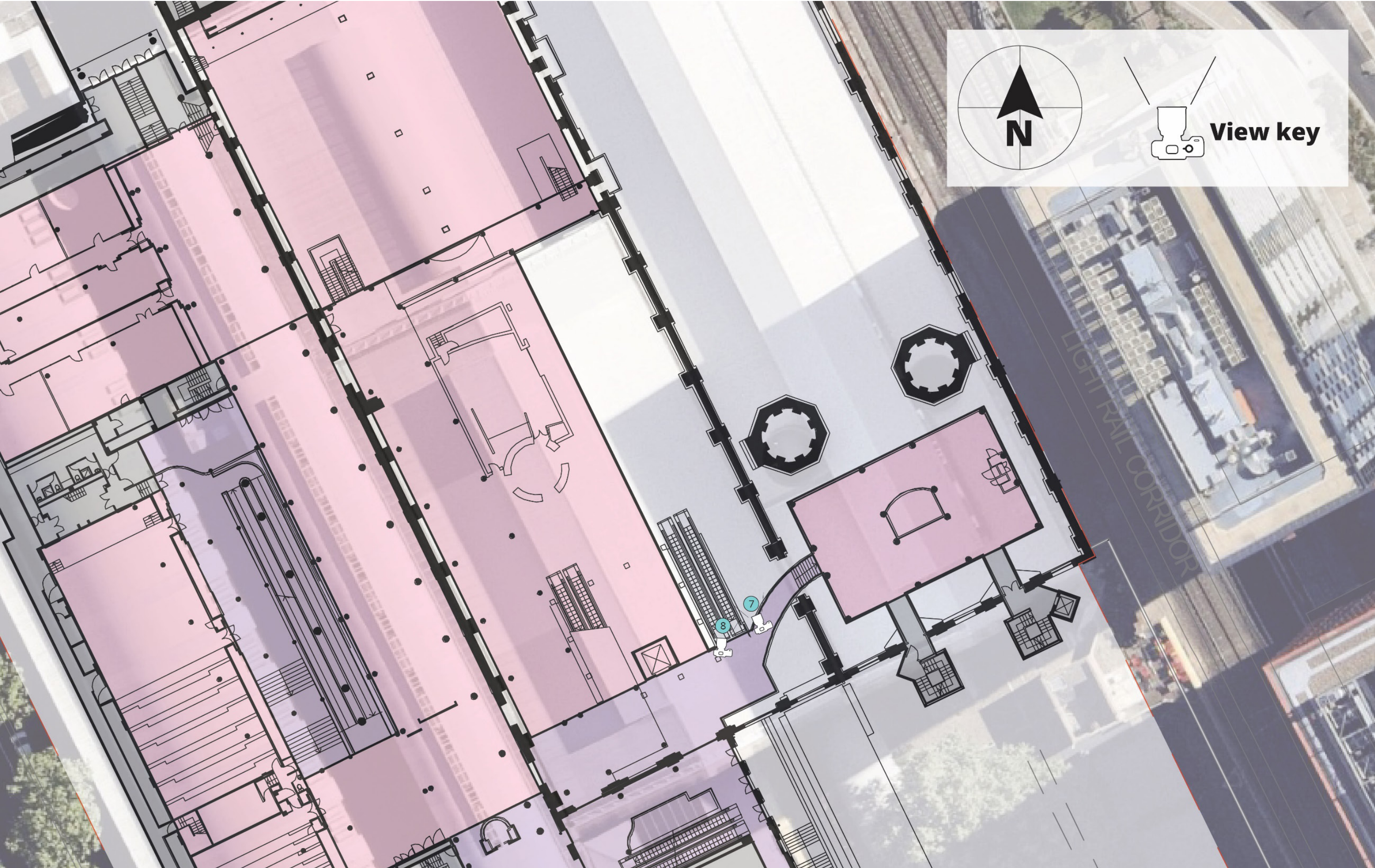
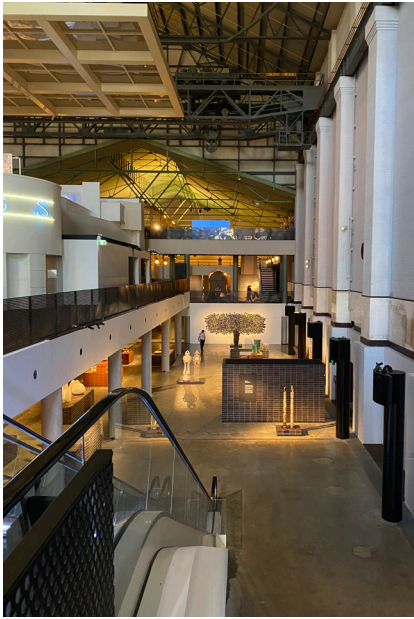


Figure 11.27 Turbine Hall Photo Register (Level 2)



Turbine Hall Viewpoint 7: Level 2



Turbine Hall Viewpoint 8: Level 2

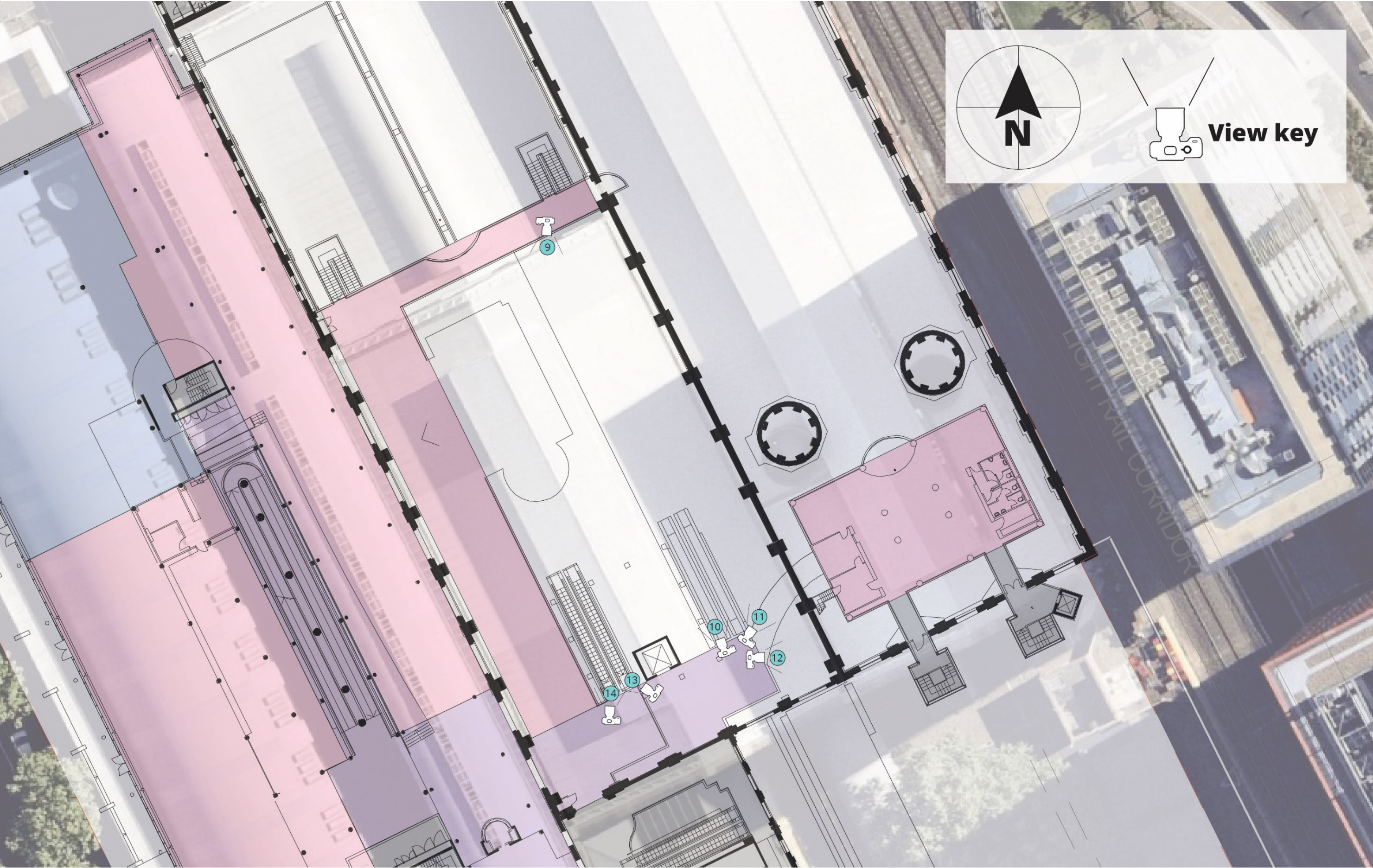


Figure 11.28 Turbine Hall Photo Register (Level 3)



Turbine Hall Viewpoint 9: View from level 3



Turbine Hall Viewpoint 10: View from level 3



Turbine Hall Viewpoint 11: View from level 3



Turbine Hall Viewpoint 12: View from level 3



Turbine Hall Viewpoint 13: View from level 3



Turbine Hall Viewpoint 14: View from level 3

11.7 ENDNOTES

1 Godden et al, 1984, pp. 108-109.
2 ibid, p. 36.
3 ibid, p. XX.
4 ibid, p. 18.
5 Architectural Projects, 2003, p. 59.
6 Museum of Applied Arts and Sciences, Annual Report 2011–2012, pp. 8-9; see also Development Application D/2011/242
7 Museum of Applied Arts and Sciences, Annual Report 2012–2013, p. 16.
8 State Heritage Inventory, NSW Office of Environment & Heritage, *Ultimo Power House* (State),
9 Godden et al, 1984, p. 18.

12 BOILER HOUSE

12.1 HISTORY OF THE BOILER HOUSE

The Boiler House was one of the original buildings constructed as part of the Ultimo Power House in 1899 (Figure 12.3). Originally measuring 105 feet x 86 feet (c. 32m x 26m), the first Boiler House was constructed as a utilitarian style brick building, adjoining the eastern side of the Engine House, and was purposefully designed to allow for future extension. At the commencement of operation of the Ultimo Power House in 1899, the Boiler House housed fourteen Babcock and Wilcox boilers, twelve of which were fed by hand from hoppers of coal delivered to the boiler fronts on rails, whilst two were mechanically fired. The main flues of each of the boilers extended along either side of the Boiler House, converging in the chimney located in the Pump House building that adjoined the Boiler House to the north.

Almost immediately following its completion in 1899, it became apparent that the Ultimo Power House required expansion to increase its output capacity, and thus a substantial southern extension of the Boiler House was constructed between 1902-1905 (an extension of 54m from the original length of the building), with the new volume of the 'second' Boiler House at the site encompassing and incorporating the structure and form of the original 1899 Boiler House (Figure 12.3). The installation of the Parson's Steam Turbo Alternator in the Turbine Hall at this time required additional boilers, necessitating construction of a second floor to the Boiler House to accommodate a further twenty-four Babcock and Wilcox boilers, requiring a corresponding height increase to the Boiler House building, to a new height of 23.5m (Figure 12.3). The new and extended Boiler House included a new pump room integrated into the main building itself (unlike the earlier northern Pump House treated as a separate entity to the Boiler House – see Part C: Section 9), along with construction of two new, 65m tall chimney stacks, each capped with a cast iron crown, at the southern end of the extended Boiler House (Figure 12.5 and Figure 12.6).

The 1902–1905 expansion of the Power House generation capacity and increased number of boilers obviously created a corresponding increase in demand for coal to fuel the boilers, as well as an improved method to manage, store, and use this coal. Thus, an upgrade of the Power House's coal handling plant (coal was originally stored at the southern end of the boiler house) was undertaken around this time, whereby railway trucks would dump coal directly into a crusher, crushed coal was fed to a chain bucket elevator, which delivered the coal into two steel bunkers (with a total storage capacity of 2,500 tonnes/two weeks of coal consumption) located above the upper boiler room (Figure 12.8). Coal was then supplied direct to the boilers for firing via chutes from overhead coal bunkers.¹ In 1912, a new pneumatic ash handling system was constructed at the southern end of the Boiler House, serving to reduce the number of staff involvement required in the removal of ashes.

Modernisation and upgrade works to the Power House undertaken between 1927-1932, included installation of additional and replacement of boilers, supported by installation of a new pneumatic coal handling plant, and a new concrete coal store with a storage capacity of 10,000 tonnes to the south of the Boiler House.² (Figure 12.9). After the modernisation works of the early 1930s, the Boiler House remains relatively consistent in form, with revisions mostly including replacement and addition of boilers over time. A severe impact to NSW coal supply in the 1940s as a result of industrial action at the coalfields, resulted in conversion of the boilers to operate on fuel oil in 1947.³

Previous Names	New Boiler House / Second Boiler House
Address	500 Harris Street, Ultimo
Lot & DP	Lot 1 DP631345
Built	1902–1905
Heritage Listings	SHR 02045 “Ultimo Power House” LEP I2031, “Powerhouse Museum Former Warehouse Buildings, including interiors”
Non-Statutory Listings	Register of the National Estate (Powerhouse Museum (Stage Two), Place ID 100690) National Trust of Australia (NSW) Register (S11648, 24/10/2015)

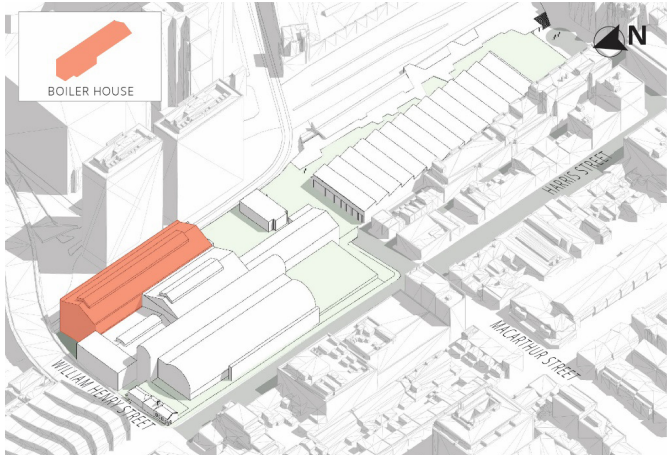


Figure 12.1 Location of the Boiler House (Source: John Wardle Architects with Curio Projects overlay)



Figure 12.2 North-eastern exterior elevation of the Boiler House (Source: Curio Projects)

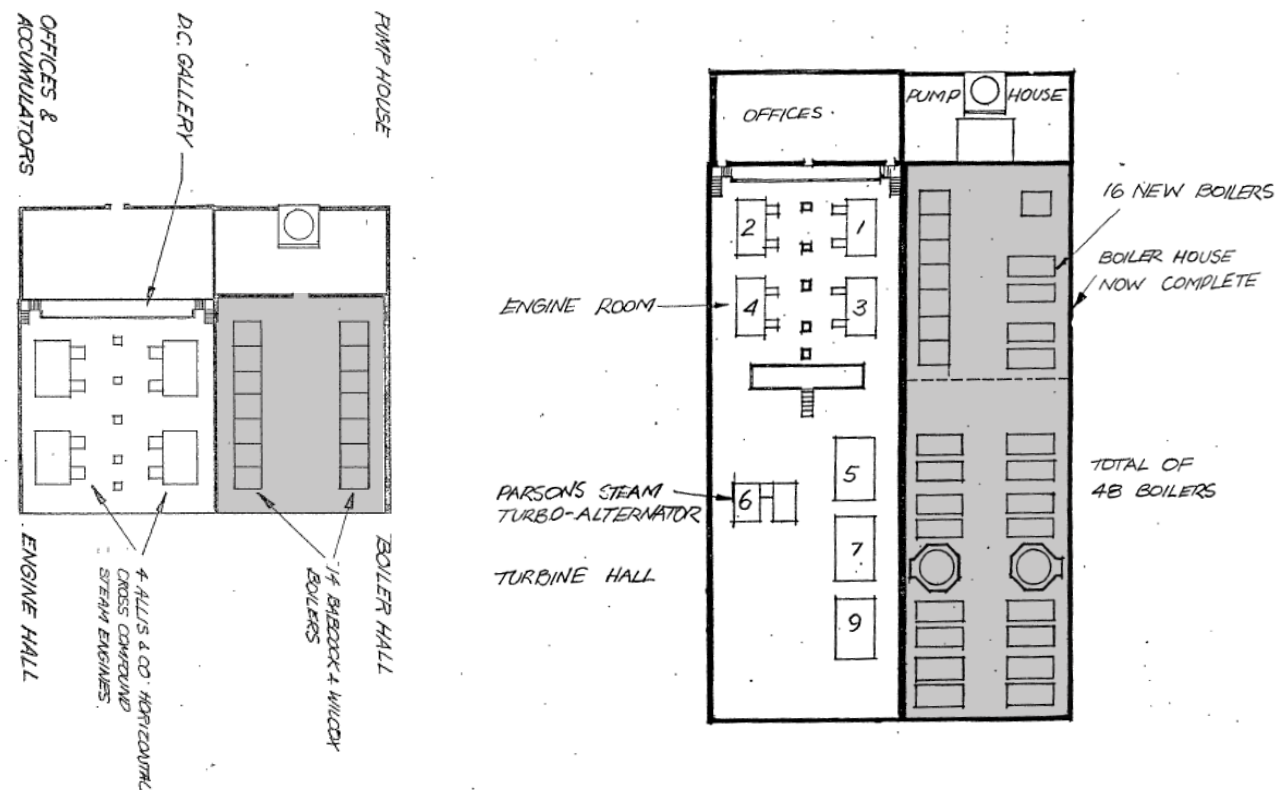


Figure 12.3 1899 Layout of the Power House layout (left) and 1902 (right). Boiler House in grey (Source: Godden et al. 1984 p. 98 & 104)

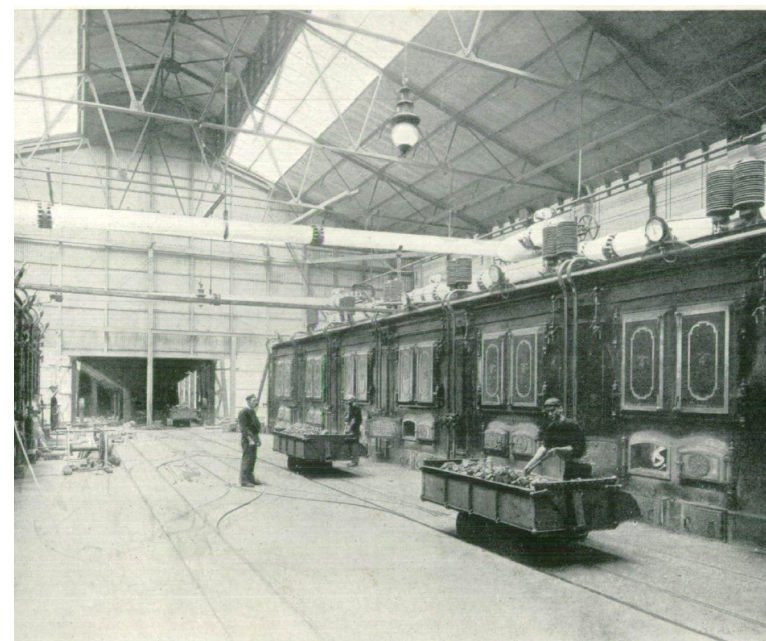


Figure 12.4 Left: Interior of the original Boiler House in 1900, prior to the extension (Source: NSW Public Works Department 1900) Right: Interior of the "New" Boiler House 1902 (Source: Electrical World and Engineer 1902 p. 890)

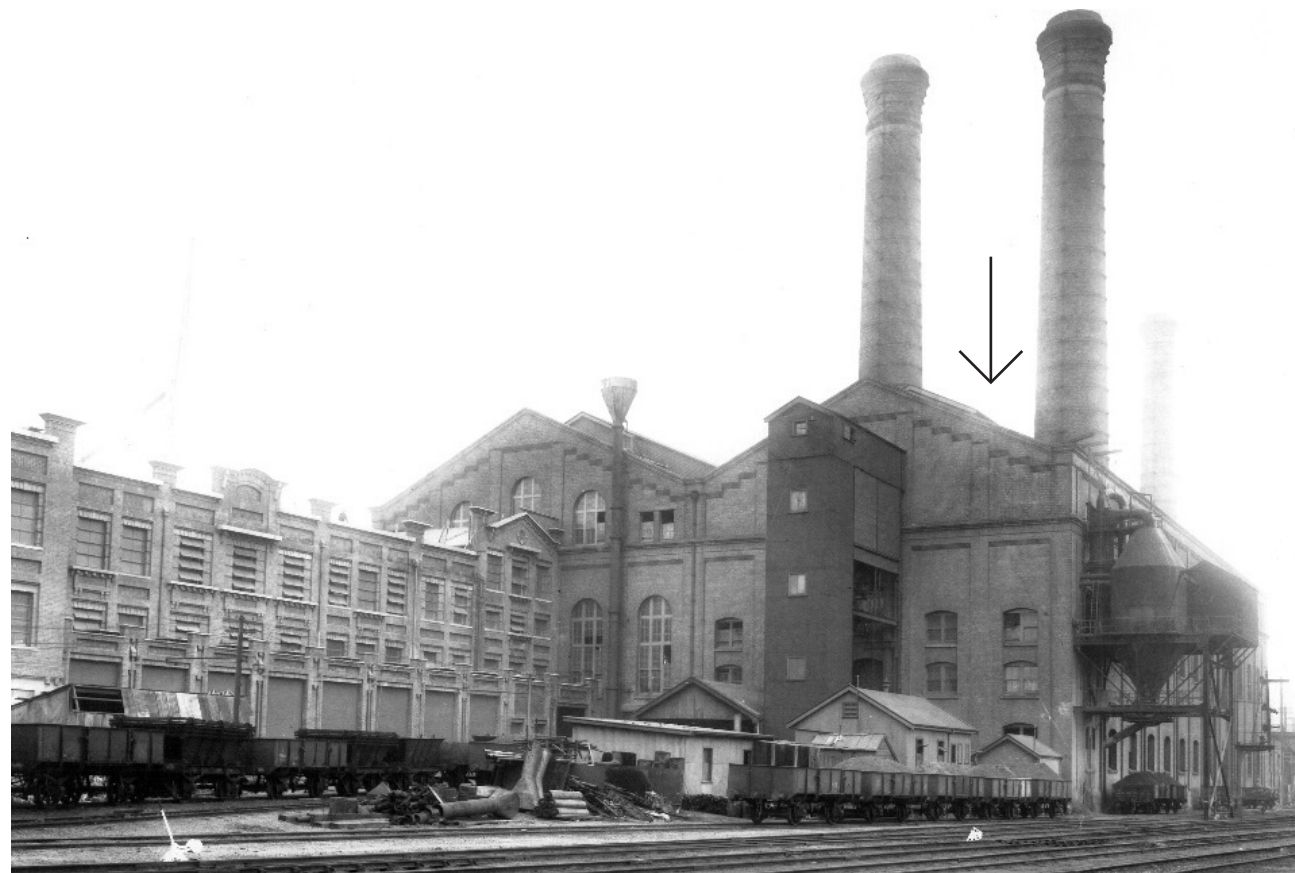


Figure 12.5 Location of the former Boiler House marked by arrow (Source: City of Sydney Archives)

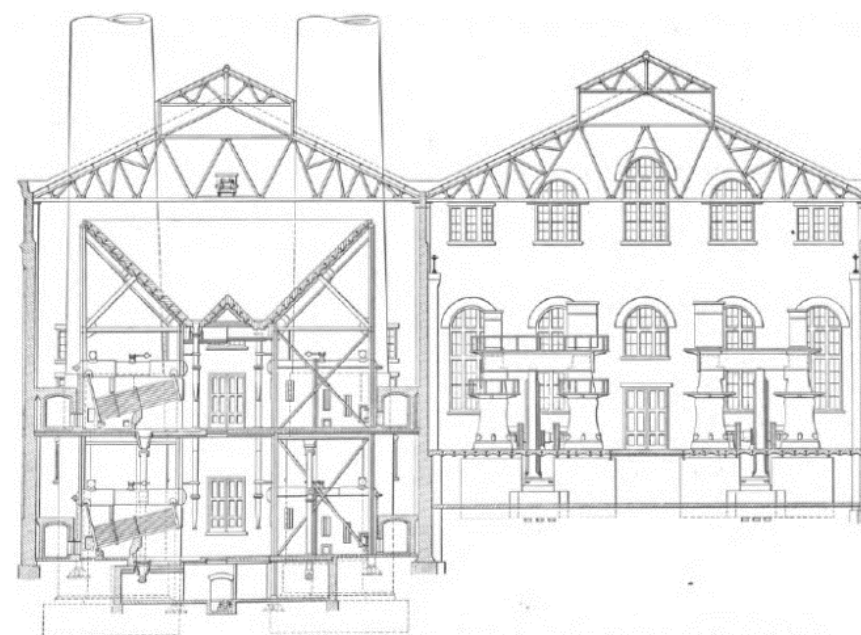


Figure 12.6 Sectional View of Boiler (L) and Engine (R) Rooms c.1902 (Source: Electrical World and Engineer 1902 p. 889)

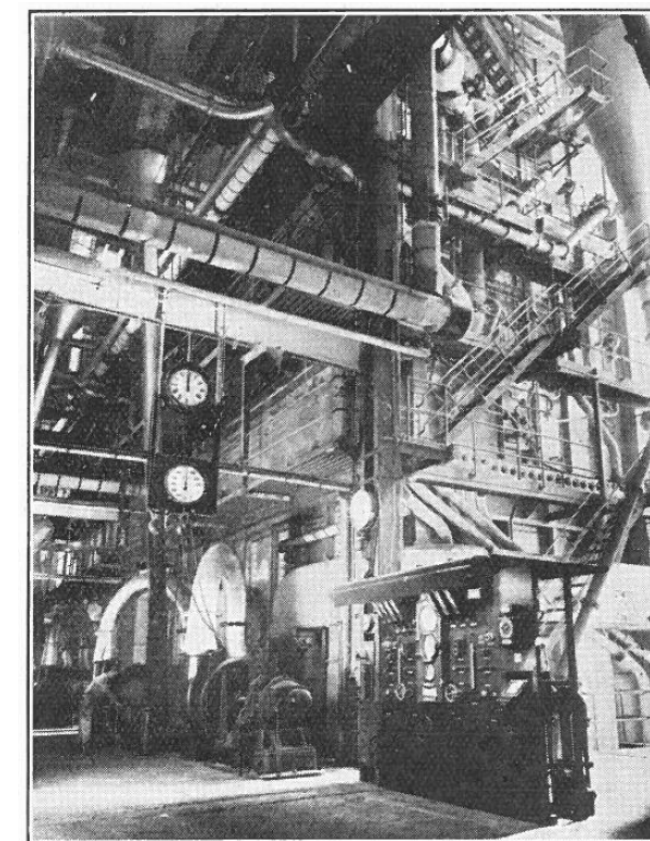


Figure 12.7 Interior of the Boiler House c. 1932 (Source: Myers, 1933, p. 265)

When the Ultimo Power House closed on 11 October 1963, the Boiler House, along with the other Power House buildings, fell into disrepair and was subsequently damaged by decay, squatters, and vandals. In 1976-77, the two brick chimneys were demolished to above the roof line, causing severe damage to the Boiler House roof and resulting in the loss of an important built element that identified the Ultimo Power House from significant distances.⁴ The 1930s concrete coal store remained in its location south of the Boiler House until 1984, at which time it was demolished as part of the conversion of the site for the Powerhouse Museum.⁵

The Godden et al (1984) heritage study of the former Power House site undertaken in preparation for the redevelopment of the site as the Powerhouse Museum, made a number of recommendations for retention of the industrial equipment and machinery of the Boiler House in its adaptive re-use:

It is essential that the hoppers, fan floors, chimney, six columns, the small dry coal hopper and the personnel elevator be conserved. These are the only remaining artifacts in the boiler house and form a substantial part of the total surviving from the electricity generating period.⁶

However, these recommendations eventually came to be predominantly overridden in the design process, and the internal features of the Boiler House were removed to create the Boiler House as a large open space capable of housing large-scale exhibitions.

The hoppers in the Boiler House originally envisaged by Lionel Glendenning to remain were removed because the opportunities to utilise the soaring space to house the exhibits took precedence over the interpretation of the remaining structures. This decision was the result of extensive debates. The mezzanine spaces, the external lift and stairs and the interpretative graphics on the east elevation were designed to refer to the scale of the hoppers that were removed.⁷

The adaptive reuse of the Boiler House as part of the Powerhouse Museum in the 1980s included conversion works to create three levels across the space, including a large exhibition space and a new mezzanine at the southern end of the building. The 1980s design for the adaptive reuse of the Boiler House was divided between several designers, including Desmond Freeman Associates ('Transport' section) and Iain Halliday of Neil Burley Designs – responsible for the 'Space' exhibition.⁸ Other 1980s works within the Boiler House included construction of modern mezzanine spaces and inserts, and construction of external lift and stairs along the building's southern façade. In 2020 the Boiler House continues to be used as an exhibition space for the Powerhouse Museum.

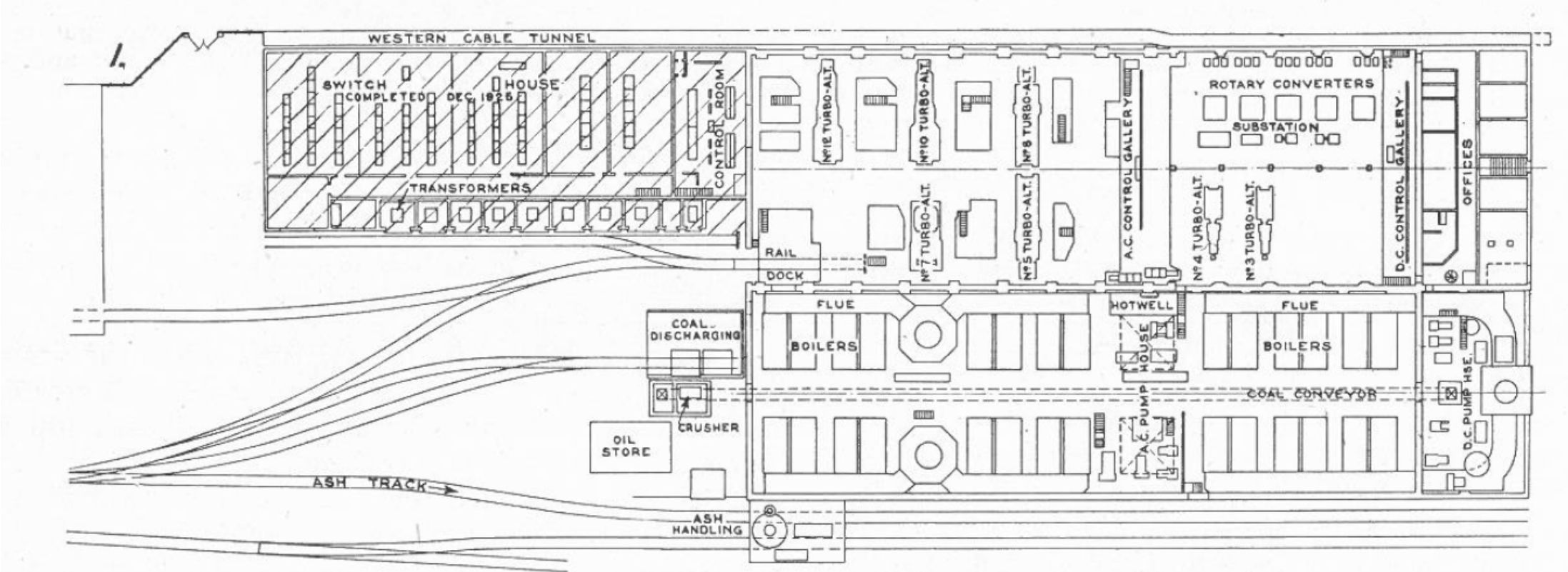


Figure 12.8 Pre 1933 Configuration of the Boiler House (Source: Myers, 1933 p.254)

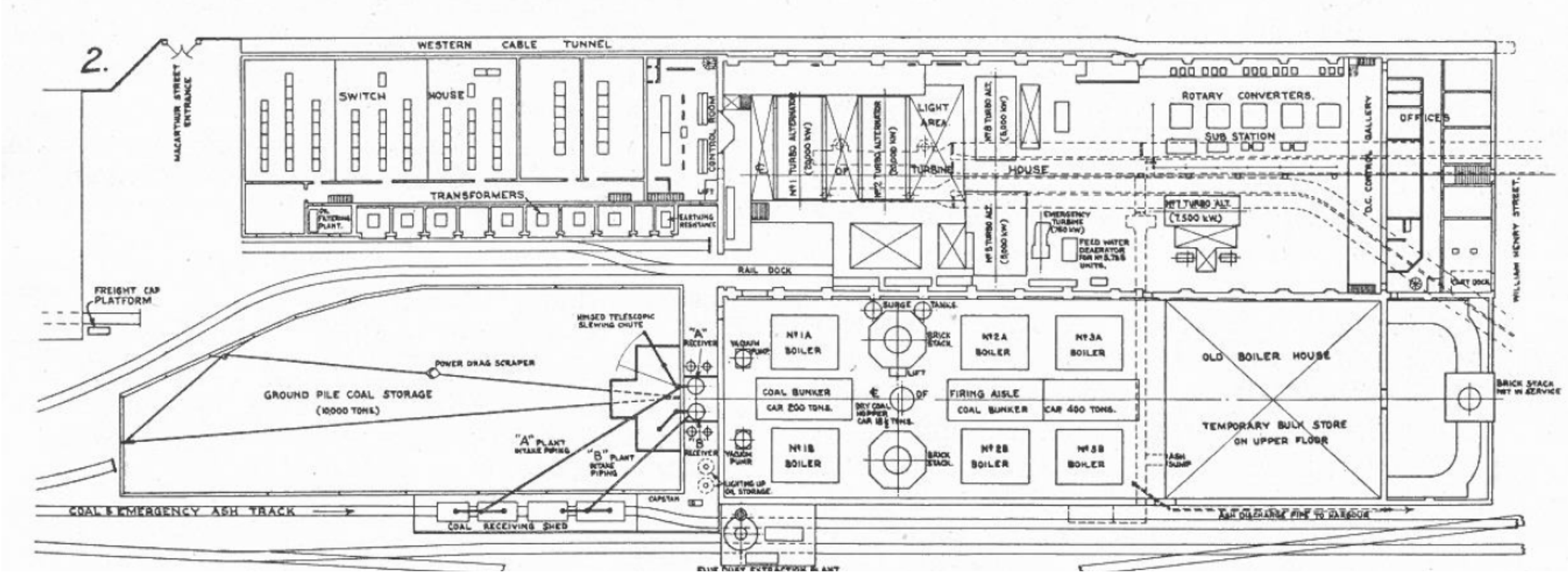


Figure 12.9 1933 Reconstruction of the Boiler House, including new concrete coal store (Source: Myers 1933, p. 254)

12.2 PHYSICAL ANALYSIS OF THE BOILER HOUSE

An overall photo register and images of the Boiler House as of 2020 is presented in Section 12.6.

12.2.1 Site and Setting

The Boiler House forms part of the Powerhouse Ultimo Site at 500 Harris Street, Ultimo. Within the Powerhouse Ultimo site, the Boiler House northern facade faces the William Henry Street bridge, bounded to the north by the remains of the former Pump House, to the east by the Light Rail line, in the south by the ‘Level 1’ courtyard, and by the Engine House and Turbine Hall to the west.

12.2.2 Built Elements

With its large continuous eastern façade divided into thirteen bays, and measuring 83m x 23m, the Boiler House is the largest of the former Ultimo Power House buildings. The building is largely utilitarian in style, with the overall design reflective of the original two-tiered boiler arrangement for the old boiler house (Pump House). The SHR listing describes the Boiler House as:

The Second Boiler House is the largest building in the complex, 83m long and 23m wide, and has the largest continuous facade to the east. The three tiers of windows, arranged in thirteen bays, are a vigorous architectural solution to the problem of dealing with a very tall facade. The height from string course to plinth is much greater than on the west facade of the Turbine Hall, which it complements. The thirteen bays are evident on the top tier of the building, above the string course. Below that, the fourth and fifth bays from the north end were combined to form a tripartite entrance bay, which allowed access to rail trucks on the east siding. The south facade of the Boiler House, although abutting the Turbine Hall and matching it in size, was treated somewhat differently, preserving the individuality of the building. The pilasters, their terminations in stepped corbels and the gable cornices are the same but the windows are smaller, arranged in two tiers and segmental-headed, as on the east facade.

The tall, roof-high stumps of two of the three brick chimneys are still in place (the upper parts having been demolished before the museum project was proposed) and in excellent condition, towering over the Boiler House. One is used as part of the museum’s air-conditioning system, and the other houses stairs that allow access to the roof.⁹

Externally, the Boiler House is highly intact, with the exception of the external sections of the original chimneys stacks that were demolished to the roof line in the mid 1970’s. New roller doors have been installed along the southern façade to the Level 1 courtyard, and the northern windows facing the William Henry Street bridge have been covered. Plaques from the Institute of Engineers and the Royal Australian Historical Society have been installed on the southern external façade, and a new round window has been installed in the former pipe opening.

Internally, the original structure of the roof trusses of the Boiler House remains visible across the open exhibition space (designed to house the Transport Gallery of the Powerhouse Museum), and the bases of the two brick chimneys in the south of the building remain – although the chimney bases have been partially concealed by museum exhibits and displays at floor level, with the bases painted white to match the modern inserts. An infill structure/southern mezzanine have been constructed behind the chimney bases. The basement is used for storage and services, with many modern services installed throughout the level. The top level of the southern mezzanine (Level 4) overlooks the open space of the Boiler House exhibition hall, and houses meeting space.

12.3 HERITAGE SIGNIFICANCE

The Boiler House, as part of the Ultimo Power House, is included within the following statutory heritage register listings:

- State Heritage Register (NSW), The Ultimo Powerhouse, SHR 02045, gazetted 04 Sep 2020.
- Sydney LEP 2012, The Powerhouse Museum Former Warehouse Buildings, including interiors, I2031.

The Boiler House is also included on two non-statutory registers; the Register of the National Estate Powerhouse Museum (Stage Two) (Listing 100690); and the National Trust (NSW) Register Powerhouse Museum (Stage Two) (S11648).

12.3.1 Summary of Significance—Boiler House

As one of the early Ultimo Power House Buildings, the Boiler House, constructed initially in 1899 with major extensions and renovations in 1902, is historically significant as part of the original electricity generating station for the Sydney tramway network. The Boiler House has historical significance as one of Sydney’s earliest buildings constructed with large unsupported spans. As the largest of the former Power House buildings, with extant remains of the two large chimneys and immense internal volume, the Boiler House is aesthetically significant for its ability to convey the industrial nature of the site and the scale of the original Power House buildings. While the Boiler House was stripped of its industrial equipment and machinery as part of the 1980s adaptive reuse for the Powerhouse Museum, the external structure of the Boiler House remains mostly intact, along with the original southern chimneys to the roof line.




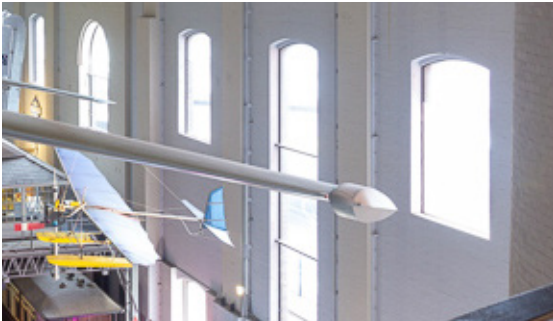
12.3.2 Views




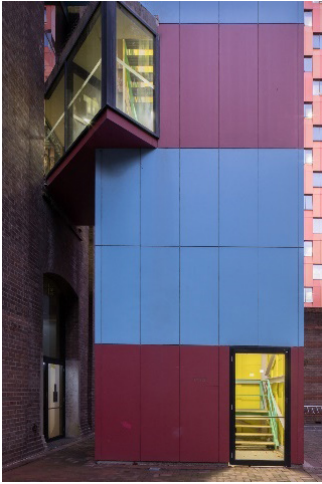
The Boiler House is the most visible of the former Power House buildings remaining at the site, with primary elevations visible in the north from the William Henry Street bridge, and east and south east from Darling Drive and the Goods Line. Views to the southern facade of the Boiler House has been partially concealed and obstructed by a number of modern elements including the coloured covers over the modern lift and stairs, the structure of the café in the level 1 courtyard, and the covered walkway from the Harwood Building. It would be preferable to remove these obtrusive elements to establish a strong visual connection to Boiler House from the Level 1 courtyard and the Macarthur Street / Goods Line entry to the Powerhouse Museum.

12.3.3 Grading of Significant Components

The key components and elements of the fabric and form of the Boiler House have been ranked accordance to the Heritage NSW criteria for assessing significance, as summarised in Table 12.1 and depicted in Figure 12.10 to Figure 12.14.

Table 12.1 Grading of Significant Components for the Boiler House

ELEMENT	IMAGE	GRADING	NOTES
Roof Finish		● HIGH	<p>While modified and replaced during the 1980s museum adaptive reuse, the prominent roof monitor roof finish is consistent with and representative of the original design of the roof, and is of high significance.</p> <p>The remnant fabric of the brick chimneys is of exceptional significance.</p>
Roof Structure		● HIGH	<p>The roof structure is original and is of high significance.</p>
External Façade and Walls (Original)		● EXCEPTIONAL	<p>The main walls and external facades of the Boiler House are original fabric from the 1899 construction and 1902 extension.</p>
Windows (Original)		● EXCEPTIONAL	<p>The brick archways of the windows are original features of the Boiler House (1899–1902).</p>

ELEMENT	IMAGE	GRADING	NOTES
Mezzanine		● LITTLE	<p>The existing infill mezzanine structure at the southern end of the building and infill near the chimneys is modern fabric installed as part of the 1980s adaptive reuse of the site for the Powerhouse Museum. The mezzanine itself presents an overall neutral visual impact in the context of the Boiler House interiors.</p>
Floor (Modern)		● LITTLE	<p>All floor coverings observed during the 2020 site visit in the preparation of this CMP were of modern fabric including tile, wood, and carpet, installed since the 1980s as part of the museum use, and are of little significance.</p> <p>No remnants of the original floor were observed during site visits. However, should any remains of the original Boiler House floor remain within the building, beneath modern floorings, these floor finishes would likely be of moderate or high significance.</p>
Chimneys		● EXCEPTIONAL	<p>The chimneys are original (1902) and of exceptional significance.</p>
Vertical Stair/Lift covers		● INTRUSIVE	<p>The original design intent of the vertical lift and stair covers along the southern façade of the Boiler House was as a modern response/interpretation of the original coal chute located in a similar location on the Boiler House wall. The bright colouring applied to these structures are a reflection of the playful use of colours in the original design intent of the 1988 development of the Powerhouse Museum, reminiscent of the Post-Modernist architectural style.</p> <p>The bright colours applied to these structures have resulted in this element being visually intrusive and impactful to the Boiler House, detracting from the appreciation and visibility of the original brick fabric and form of the Boiler House from the south. This is particularly the case in 2020, when many of the brighter more colourful aspects of the original 1988 museum design have since been overhauled and removed from the site, most notably during the 2011-2012 revitalisation works.</p>

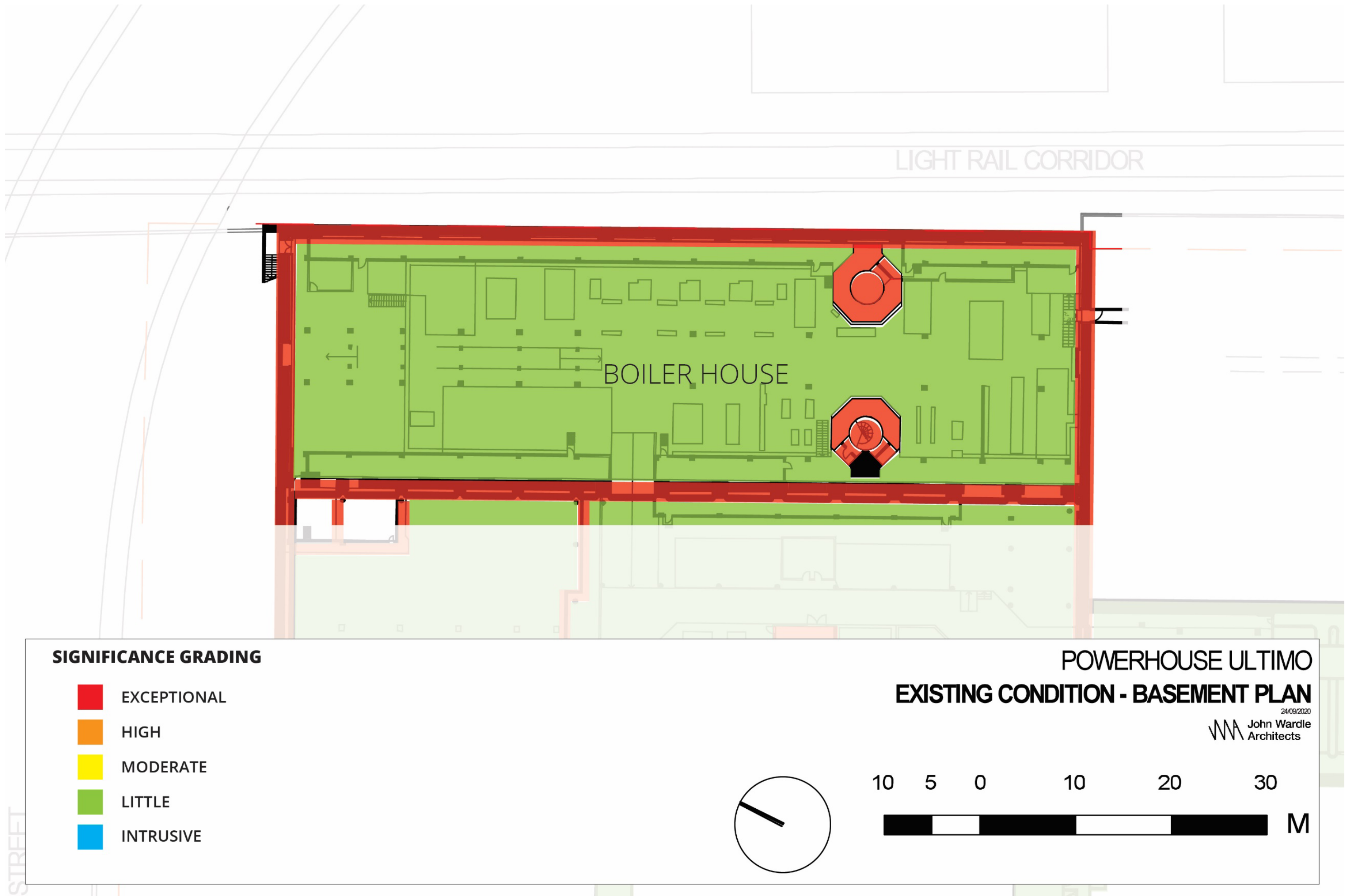


Figure 12.10 Boiler House Grading of Significance (Basement) (Source: John Wardle Architects plan with Curio Projects overlay)

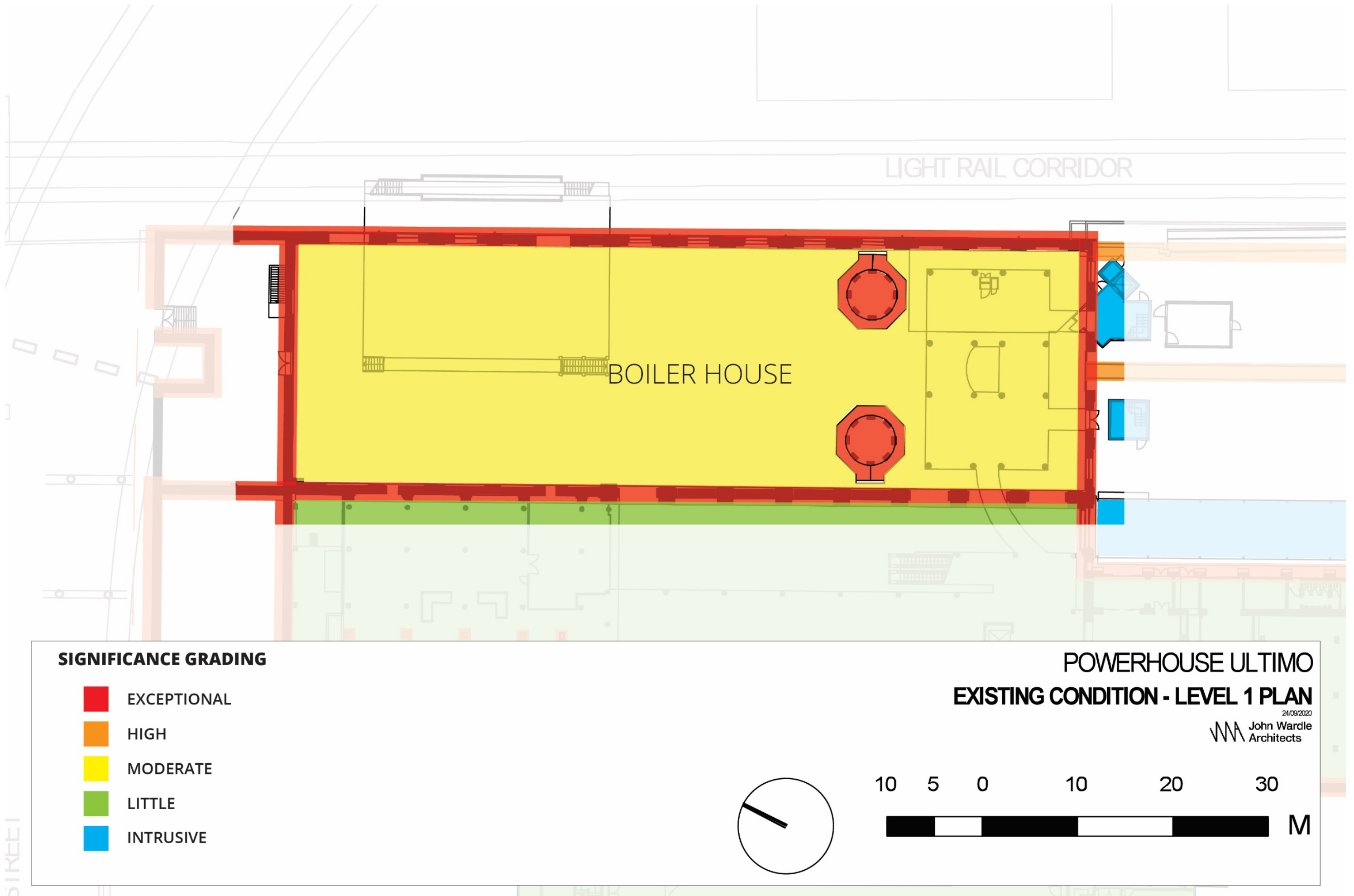


Figure 12.11 Boiler House Grading of Significance (Level 1) (Source: John Wardle Architects plan with Curio Projects overlay)

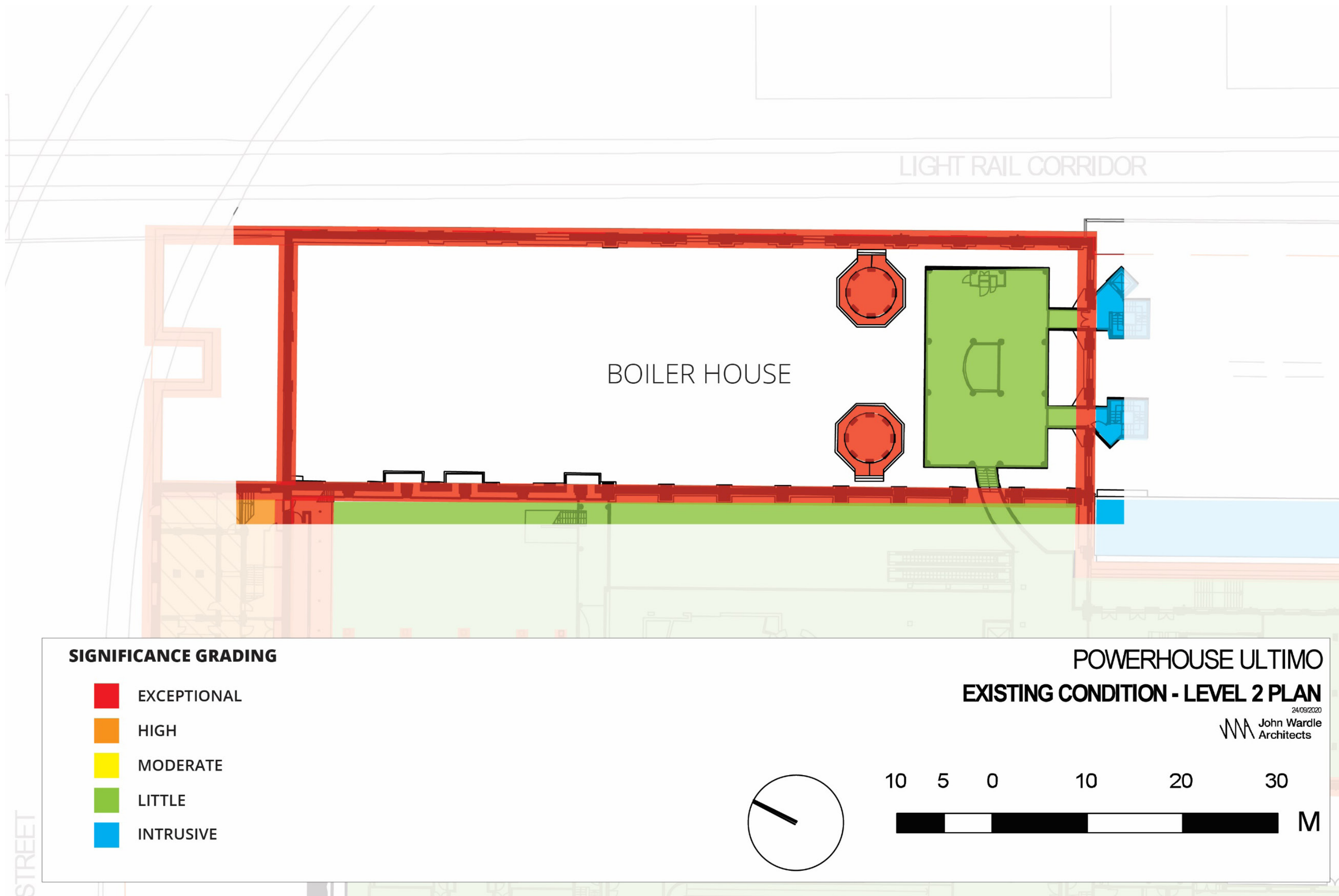


Figure 12.12 Boiler House Grading of Significance (Level 2) (Source: John Wardle Architects plan with Curio Projects overlay)

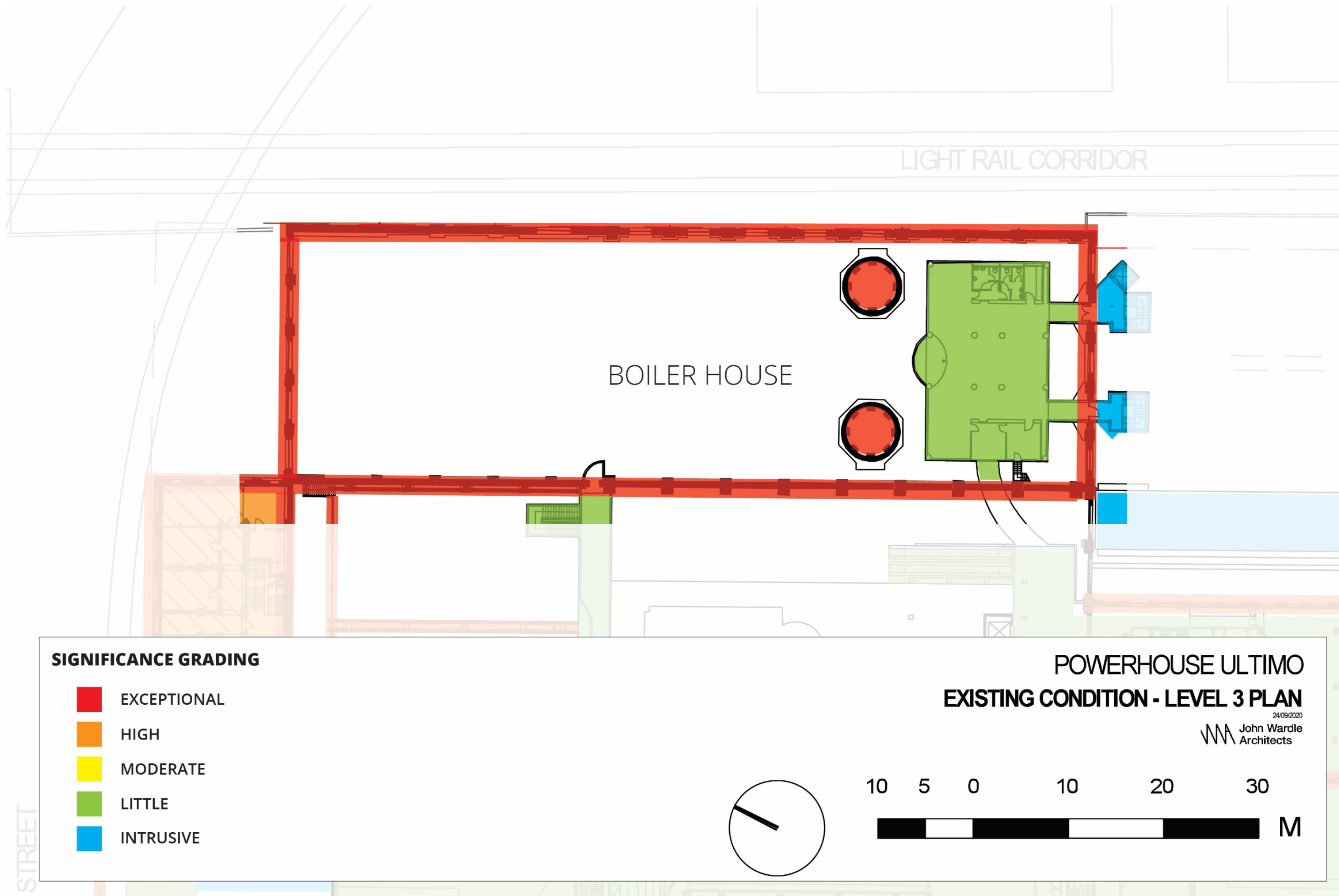


Figure 12.13 Boiler House Grading of Significance (Level 3) (Source: John Wardle Architects plan with Curio Projects overlay)

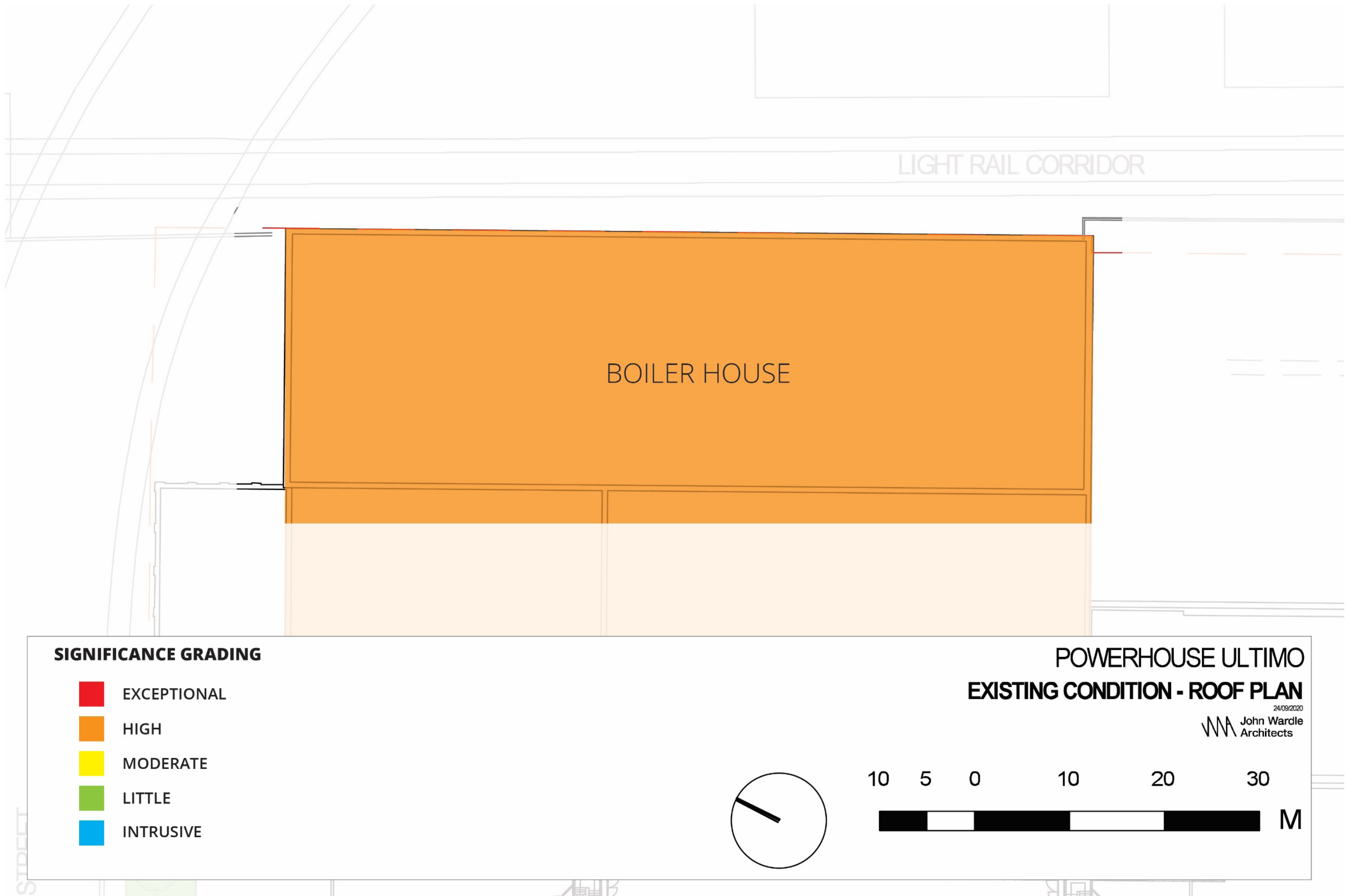


Figure 12.14 Boiler House Grading of Significance (Roof) (Source: John Wardle Architects plan with Curio Projects overlay)

12.4 OPPORTUNITIES AND CONSTRAINTS

Opportunities and constraints specific to the Boiler House include:

- Opportunities**
- Creation of a museum entry through the Level 1 forecourt directly into the southern end of the Boiler House would encourage access into the Powerhouse site from the east via the Light Rail and Good Line.
 - The demolition of the majority of the Boiler House chimneys in the 1970s resulted in the loss of an element whose scale and form allowed the Ultimo Power House to be identified from a great distance. There is an opportunity to enhance what remains of the chimneys within the Boiler House.
 - The replacement or removal of the existing vertical coloured structures along the southern façade of the Boiler House with structures, materials, or colour palette more sympathetic to the heritage aesthetics of the Boiler House would impact positively on this area of the heritage item.
 - Possibility for removal or replacement of the existing neutral infill structure in the southern interior of the building as part of any future management or redevelopment of the site.
 - The scale of the building and vastness of interior space allows for the introduction of new sympathetic elements, provided that introduction of new elements still allow readability of the building’s height, volume and roof form, from key internal locations within the building..
 - Programmatic Interpretation of the history and former use of the Boiler House.
- Constraints**
- Any future works to convert the space will need to consider how to manage elements such as partitioning, division of space, light spill and acoustics so that there are no detrimental impacts to the original fabric of the building, including its spatial volume, and overall visual aesthetic.
 - Views to and from the existing remnant chimneys, windows and associated infrastructure should be retained without significant obstruction.

12.5 ITEM-SPECIFIC CONSERVATION POLICIES

Policy 5—Buildings and Structures: The readability and presentation of the interior open space of the Engine House, Turbine Hall, and Boiler House is a significant feature of these former Power House buildings, and should be retained. The Boiler House, including its spatial volumes and remnant fabric of the chimneys form part of the significant fabric of the building. These elements should be retained, conserved and interpreted as part of any future use of the site unless for a temporary exhibition, installation or event.

- Any new insertions within the key heritage items of the former Ultimo Power House (Engine House, Turbine Hall, and Boiler House) should retain and encourage visibility of significant industrial heritage features and elements such as gantry beams & cranes, columns, overhead tracks, etc, and respect the internal scale and sense of space. New elements, if required to be introduced into heritage spaces, should act as stand-alone lightweight elements that can be readily reversed in the future.

Policy 15—Compatible Use: Any activity that would require closing in the open roof plan (i.e. such as a false ceiling), covering and/or impacts to the remnant chimney bases would have a detrimental visual and physical impact on the significance of the building and would not be compatible or consistent with the remnant significant fabric and space. Should light, sound, and division of spatial volumes be required, then no permanent visual or physical obstructions that obstruct views to the chimneys, windows, walls and/or roof trusses should be applied.

12.6 PHOTO REGISTER FOR THE
BOILER HOUSE

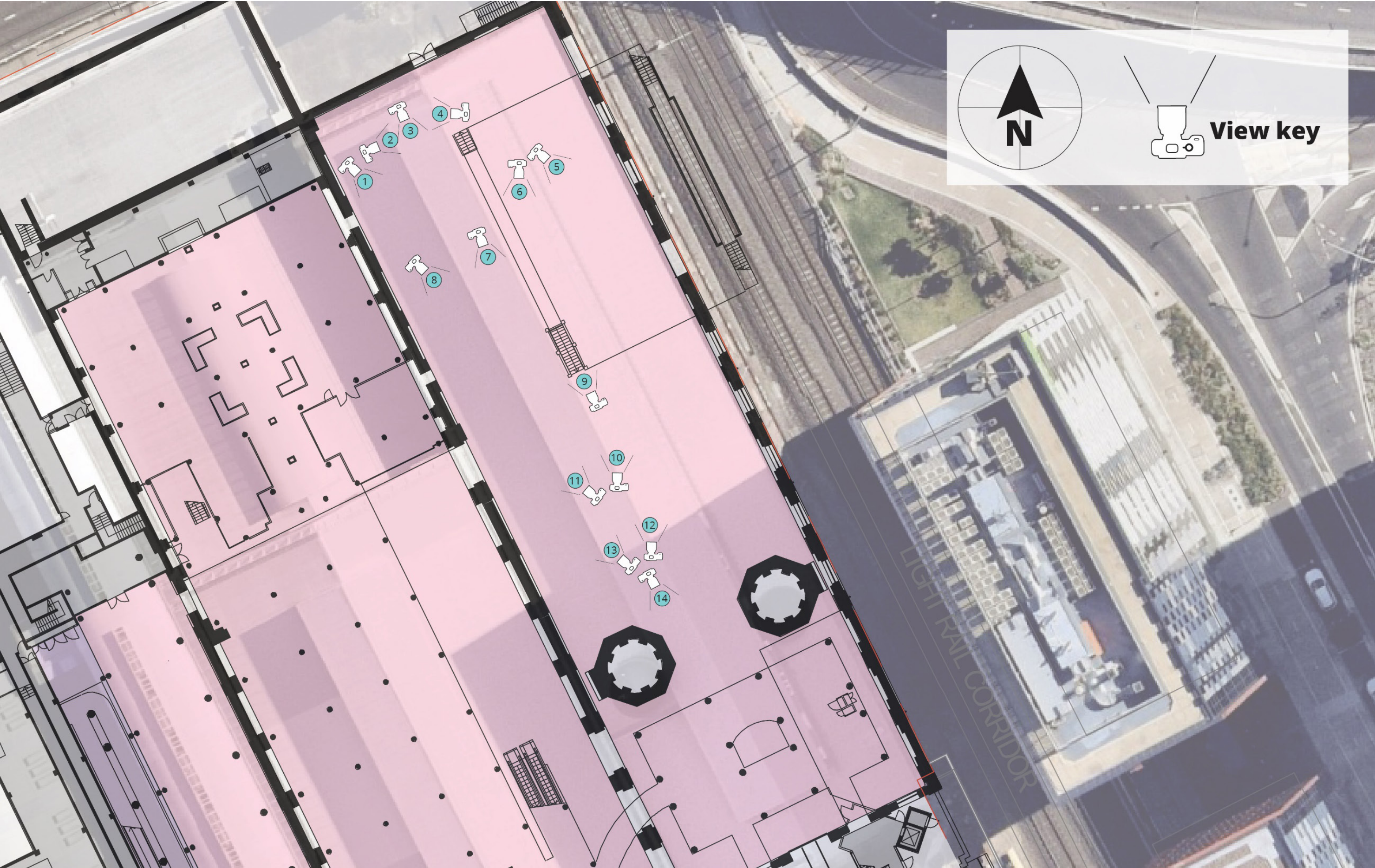


Figure 12.15 Boiler House Photo Register (Level 1)



Boiler House Viewpoint 1: Level 1



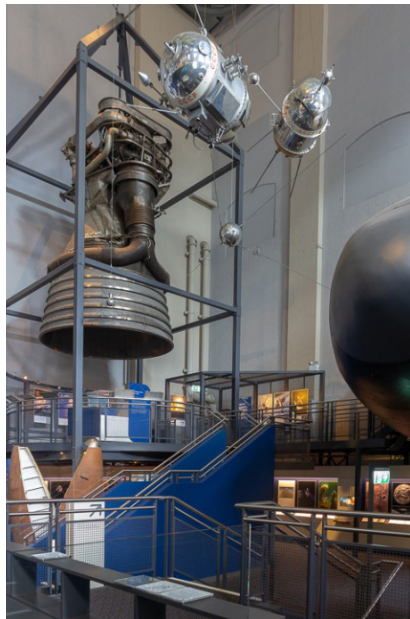
Boiler House Viewpoint 2: Level 1



Boiler House Viewpoint 3: Level 1



Boiler House Viewpoint 7: Level 1



Boiler House Viewpoint 4: Level 1



Boiler House Viewpoint 5: Level 1



Boiler House Viewpoint 6: Level 1



Boiler House Viewpoint 8: Level 1



Boiler House Viewpoint 9: Level 1