OFFICIAL

Supplementary Information



Blackwattle Bay SSP Study

December 2022 Part III



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Infrastructure NSW received several requests from the Department of Planning and Environment following the issue of the Blackwattle Bay Response to Submissions in June 2022. This document compiles additional information provided in attachments, as set out below.

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Commercial Market Peer Review Blackwattle Bay

FINAL DRAFT September 2022

Prepared by Macroplan For Infrastructure NSW



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1. Local and regional context

1.1 Subject site

Macroplan understands that the Department of Planning, on behalf of the NSW Government, is undertaking a strategic review of the Pyrmont Peninsula and is outlining a coordinated vision across many renewal opportunities including Blackwattle Bay.

Blackwattle Bay precinct spans approximately 8.4 hectares of harbourfront land between the Anzac Bridge and the Sydney Secondary College on Bridge Road in Glebe. The precinct comprises of the following sites:

- Existing Fish Market
- New Sydney Fish Market
- Private landowners
- Bank Street open space

The existing Fish Market (i.e., subject site) is situated about 1.2km west of Sydney's CBD and is contained within an area between Pyrmont Bridge Road, Bank Street, the Western Distributor and Blackwattle Bay. As such, it has frontages to Pyrmont Bridge Road and Bank Street.

The subject site is located within a maritime area fronting Blackwattle Bay and is adjacent to the Western Distributor and the Ultimo-Pyrmont Urban Renewal area.

Over recent years, the surrounding parts of Pyrmont have been transformed from primarily industrial uses to mixed residential and commercial uses.

Map 1 Locality map



Source: Macroplan

1.2 Revitalising Blackwattle Bay

The revitalisation of Blackwattle Bay precinct offers an extraordinary opportunity to reconnect the harbour, its surrounding neighbourhoods and the Sydney CBD, to showcase culture and stories of Country, to build an inclusive and iconic waterfront destination that celebrates innovation, diversity and community.

The diverse mixed-use precinct will be a catalyst for attracting tourists and visitors to the area and creating jobs.

The revitalisation of Blackwattle Bay precinct is anticipated to deliver:

- A waterfront promenade from Woolloomooloo to Rozelle.
- An authentic, and world class new Sydney Fish Market at the heart of Blackwattle Bay.
- New parks and green space with 50% new public domain and 30% new open space.
- New connections to bring the neighbourhood closer to the harbour through new and improved pedestrian and cycling links.
- New homes, jobs and services.
- An authentic place, by building on Indigenous and industrial stories and celebrating the local character.

The precinct plans scenarios* anticipate that the future renewal of Blackwattle Bay can deliver between 4,000 and 7,000 jobs, 1,045 and 1,700 homes and 30,000 sqm of open space.

Figure 1 Artist's impression of the revitalised Blackwattle Bay





Source: Infrastructure NSW

*Scenario 1 Homes: Refers to using the existing urban landscape to reconnect the lands of Blackwattle Bay with the vibrant mixed-use neighbourhood of Pyrmont. *Scenario 2 Balanced: Focuses on the natural layers of Blackwattle Bay. *Scenario 3 Jobs: An innovation-oriented, mixed-use precinct which references the surrounding brick warehouse buildings. Figure 2 Blackwattle Bay precinct planning area



Source: NSW Government

1.3 Regional context

The Greater Sydney Commission has identified that by 2036, the Eastern City District will need 157,500 new homes and the Harbour CBD and its fringe areas need to provide up to 235,100 jobs. Blackwattle Bay provides a rare precinct-scale opportunity for new homes and employment, spanning approximately 8.4 hectares of harbourfront land, circa 1km from the western edge of the Sydney CBD.

The Harbour CBD is one of the largest office markets in Australia with more than 6,700,000 sqm of office floorspace plus retail, showroom, medical uses, civic and hotel facilities and high-density residential development. The CBD houses over 496,000 workers, more than 50% of the Eastern City District jobs.

Blackwattle Bay falls under Pyrmont (Sydney CBD Fringe), which is one of the largest city fringe markets comprising just over 250,000 sqm of office space.

Harbour CBD falls in the Greater Sydney Commission's Eastern City District, and it is the core of their Eastern Harbour City vision as part of the A Metropolis of Three Cities plan. Being near the geographic centre of Eastern Harbour City, Harbour CBD is to be the commercial locus of substantial portions of Greater Sydney, which will bring in substantially greater commercial and residential activities. The region's economy is centred on education, health and research institutions as well as digital innovation and start-ups, administration, finance and business services. Table 1 Major office precincts, Greater Sydney

Precinct	Office floor space (sqm)
Sydney CBD*	5,079,899
Macquarie Park	878,950
Sydney CBD Fringe*	864,640
North Sydney*	822,496
Parramatta CBD	707,099
St Leonards	315,542
Chatswood	278,919
Norwest	272,474
Green Square/Mascot	200,000
Rhodes	161,668
Sydney Olympic Park	158,907

* Components of Harbour CBD

Source: GSC (based on Colliers research, 2017)

1.4 The new Sydney Fish Market

The NSW Government has committed \$750 million to the relocation and development of the existing Sydney Fish Market, linking the Glebe foreshore promenade to Pyrmont. The Sydney Fish Market will be relocated to the head of Blackwattle Bay and will open to the public in 2024.

The Sydney Fish Market will be the catalyst for the renewal of Blackwattle Bay. Blackwattle Bay consists of two distinct stages:

- Stage 1: The new Sydney Fish Market at the head of Blackwattle Bay
- Stage 2: The area bound by the Glebe Island Bridge, Bank Street, Pyrmont Bridge Road and Blackwattle Bay

Once completed, the new Sydney Fish Market will:

- Provide approximately 700 jobs during construction and support 700 jobs once operational.
- Be a waterfront promenade, a ferry wharf and more than 6,000 sqm of public open space.
- Host a variety of fishmongers, restaurants, cafes, bars and specialty food retailers in a market hall setting.
- Be an authentic experience and strengthening its position as one of Australia's leading tourist destinations.
- Be a catalyst for economic growth, with visitor numbers to the area doubling in the next 10 years

Figure 3 Artist's impressions of the new Sydney Fish Market





Source: Infrastructure NSW

1.5 Opportunities and constraints

There are a number of opportunities and constraints presented by the subject site and Blackwattle Bay precinct.

Table 2 SWOT analysis, subject site and Blackwattle Bay generally.

Strenç • •	S ths The new Sydney Fish Market development will be a catalyst for attracting tourists and visitors to the area. The subject site is Government owned land (i.e., no land fragmentation). Subject site will benefit from additional amenities (new Sydney Fish Market, more open space, improved transport amenity such as Sydney light rail and future Metro station). Future residential development in Blackwattle Bay will facilitate retail activation (providing critical mass).	Weak • •	 Connectivity – the existing Sydney Fish Market site is not proximate to transport modes (i.e., Sydney Metro West) where clustering of jobs generally occurs. The subject site is adjacent to the Western Distributor – Eastern side of the development will lack in visual appeal. Potential to increase traffic congestion. A portion of land in Blackwattle Bay is under private ownership. This land ownership is fragmented (i.e., 3 owners).
Oppor	U tunities A brand-new development in Pyrmont. Currently there is a lack of new office development in Pyrmont. Increase in tourism and visitation, onsite population, along with businesses could potentially make the future development in Blackwattle Bay viable.	Threa • •	ts Hesitancy for workers to be located at a distance from the Sydney CBD. Competition from other surrounding precincts such as Chinatown, growth in Sydney CBD and the emerging Tech Central precinct (Eveleigh). Economic downturns/current tight economic conditions.

2. Strategic planning context

2.1 Greater Sydney Commission

The Eastern City District is expected to accommodate 19% of Greater Sydney's future population and will house an additional 325,000 people by 2036. The population growth, as well as future investment and land use planning, will drive significant housing & job growth, both of which are required to sustain and accommodate future residents.

A key priority of the Greater Sydney Commission's (GSC's) Central City District Plan (2018) is Priority E7 which aims to grow a stronger and more competitive Harbour CBD by increasing the area's capacity to develop increased residential and commercial floor space.

Harbour CBD has a target of between 165,100-235,100 new jobs by 2036 and is preparing to support this through the expansion of its office market through the implementation of The City of Sydney's Central Sydney Planning Strategy and the Planning Proposal Central Sydney, including the revitalisation of Blackwattle Bay.

The Harbour CBD is the metropolitan centre of the Eastern City District, which is Australia's global gateway and financial capital encompasses has half a million jobs and the largest office market in the region.

Pyrmont's role within Harbour CBD is defined as part of the Innovation Corridor, and has high number of digital innovation and start-ups as they seek out space in character buildings in suburbs like Pyrmont and are attracted to a diverse pool of talent and expertise, research facilities, customers and investors. Pyrmont will continue to become an emerging digital cluster and beginning to make a mark as a dynamic destination for visionary and creative businesses, and compliment the service-based and knowledgeintensive job growth in the Harbour CBD.

Figure 4 Harbour CBD



2.2 City Plan 2036: Local Strategic Planning Statement (LSPS)

Council's *LSPS*, coming into effect in March 2020, sets out a 20 year vision for land use planning in the city, the basis or context for planning, the planning priorities and actions needed to achieve the vision and the governance and monitoring of the priorities and actions.

The vision for the City of Sydney is to become "green, global and connected".

The City of Sydney is made up of 10 villages. Blackwattle Bay falls within the Harris Street village and Glebe Point Road village. The village is identified as the host to the regional headquarters of the broadcasting, publishing, media and technology sectors, as well as major educational institutions and tourism. The village's foreshore has been progressively opened up over time with new parks and waterside boardwalks, along with new residential and retail development. Whilst Glebe Point Road village features extensive parklands and new high density residential development along the former industrial foreshore areas.

By 2036, an additional 200,000 people will be working in the area. The *LSPS* recognises that affordable employment floor space is a pressing issue. *"As high-value office development expands outwards into the City Fringe area, this will displace the employment uses currently taking advantage of these well-located but currently more affordable areas. This will present a challenge and opportunity for the City to support its creative, entertainment and research sectors, as well as emerging small businesses and start-ups".*

The City of Sydney is expected to grow to a population of 340,000 residents by 2036 (+115,000 residents since 2016), and will need 56,000 additional dwellings. The City is also expecting to attract 1.7 million people each day.



Source: City of Sydney

2.3 Major infrastructure context

Sydney light rail

Sydney's light rail connects Sydney's future transport network, taking passengers from Dulwich Hill into the Sydney CBD, allowing for the creation of more connections and ample choice in terms of travel modes.

The key benefits of the light rail are:

- An improved urban experience, reduced congestion and sustainability.
- Better public transport with more connections for people.
- Boosting the economy by enabling links to key shopping and entertainment destinations.

The L1 – Dulwich Hill line, L2 – Randwick line and L3 – Kingsford line are now operational as of 2020.

The Sydney light rail, along with the existing bus and rail interchange, and the future Sydney Metro West will provide ample choice, accessibility and convenience to those working in and/or visiting Blackwattle Bay.

Both the subject site and the new Sydney Fish Market will be located within walking distance to the light rail (approx. a 5-to-7minute walk from the 'Fish Market' stop & 'Wentworth Park' stop), enabling workers to easily travel between major business, health and educational nodes within the Harbour CBD.

Figure 5 Sydney light rail: Network map



Source: Transport for NSW

2.3 Major infrastructure context (cont.)

Sydney Metro West

The NSW Government have committed to delivering the Sydney Metro West, which will provide a new underground rail connection between the Parramatta CBD and Sydney CBD within the next 10 years. The Greater Sydney Services and Infrastructure Plan (2018) identifies the Sydney Metro West as the NSW Government's priority rail network extension project.

Sydney Metro West will include new metro stations at Westmead, Parramatta CBD, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock, The Bays Precinct and Sydney CBD. The NSW Government is also assessing optional stations at Rydalmere and Pyrmont.

Pyrmont Metro Station will support Pyrmont Peninsula as one of the major employment growth centres, boosting jobs and improving connections across Greater Sydney. It will provide easy, efficient and accessible interchange with buses and the Sydney light rail.

The new metro station at Pyrmont is expected to deliver major benefits to the Pyrmont community and supporting plans to transform the harbourside area. The future Pyrmont station, located between Pyrmont Bridge Road and Union Street with entrances on both streets, will enhance the level of connectivity to the Pyrmont Peninsula and facilitate pedestrian movement.

Another additional mode of transportation, along with a number of good quality walking and cycling routes, will improve accessibility and provide convenience to those working in and/or visiting Pyrmont/Sydney CBD. The proximity of the Sydney Metro West to Blackwattle Bay will enable workers to rapidly commute between Western Sydney and Sydney CBD, travel target time of about 20 minutes.







Figure 7 Sydney Metro West: Routes

Source: Sydney Metro West

2.4 Pyrmont Peninsula Place Strategy

The *Pyrmont Peninsula Place Strategy* is shaped by the overall strategic vision of the Greater Sydney Region Plan and the Eastern City District Plan. The *Strategy* creates a 20-year vision and planning framework to support the NSW Government's vision to transform the Pyrmont Peninsula while meeting the aspirations of the business, industry, visitors, local and future residents.

The Pyrmont Peninsula is anchored by an industry mix geared towards knowledge intensive industries, namely tourism and entertainment and media and information technology. By 2041, the Pyrmont Peninsular is expected to accommodate strong growth in jobs with an increase of 20,000 to 23,000 jobs. The supply of commercial buildings is also expected to increase by an additional 600,000 to 800,000 sqm of floor space by 2041.

Seven sub-precincts are identified within the Strategy:

- 1. Pyrmont Village: A place of history, innovation and culture.
- 2. Pirrama: A place of waterfront living and working harbour heritage.
- 3. Darling Island: A place of entertainment, tourism and innovation.
- 4. Blackwattle Bay: A place of transformation and renewal.
- 5. Tumbalong Park: A place of attraction and interaction.
- 6. Wentworth Park: A place of home, work and recreation.
- 7. Ultimo: A place of integration, education, creativity and culture.

The subject site falls within the Blackwattle Bay precinct. Characterised currently as an industrial working harbour, Blackwattle Bay precinct is set to transform to a place attracting businesses and employees, visitors, and tourists. Enhancing access to the sub-precinct will be the future Metro station. The *Strategy* anticipates that a cluster of media businesses can be strengthened with new employment floor space.



Source: Pyrmont Peninsula Place Strategy

2.5 The City of Sydney's Central Sydney Planning Strategy

The Central Sydney Planning Strategy is a 20-year growth strategy that revises previous planning controls and delivers on the City of Sydney's Sustainable Sydney 2030 program for a green, global and connected city. Central Sydney generates over \$108 billion of economic activity annually (8% of the total national economy). It has the highest concentration of top 500 companies and mainstream artistic and cultural institutions in Australia and is its largest retail centre.

Blackwattle Bay sits within the Bays Precinct. The redevelopment of the Precinct can contribute significantly to shaping Central Sydney's future employment characteristics. It can provide space for education and learning, be a hub for sustainable research and development, support the expansion of start-ups and creative industries, and accommodate global businesses.

The main priorities for the Bays Precinct should be:

- Public transport
- Diverse employment floorspace
- Affordable housing

Central Sydney Planning Strategy



The *Central Sydney Planning Proposal* has been approved in November 2021.

The planning proposal seeks to amend the Sydney Local Environment Plan (LEP) 2012 as follows:

- Remove 'residential accommodation and serviced apartments' from receiving additional floor space for all areas;
- Increase additional office premises, business premises or retail premises in Chinatown and Haymarket.
- Add a new design excellence 'plus' process which would allow for up to 50% additional floor space to be awarded for development with a site area greater than 2,000 sqm, where it demonstrates design excellence in an identified tower cluster area.



3. Socio-demographic assessment

3.1 Population

3.1.1 Population trends

Sydney LGA

In the 9 years to 2020 (Table 3), the population of Sydney LGA grew by 65,455 residents to reach 248,736 residents in 2020, at compound annual growth rate of 3.5%.

In 2020, those aged 0-34 made up over 50% of the total population in the LGA.

Between 2016 and 2020, residents in the age bracket 20-34 grew the most by 11,680 residents, followed by those residents aged 65+ (4,196 residents).

Table 3 Historical population trends, Sydney LGA

Age cohort	2011	2016	2020	Growth rate (2011-2016)	Growth rate (2016-2020)
0-19	18,993	24,676	25,353	5.4%	0.5%
20-34	84,149	104,320	116,000	4.4%	2.1%
35-54	50,897	57,756	65,125	2.6%	2.4%
55-64	14,929	17,385	19,482	3.1%	2.3%
65+	14,313	18,580	22,776	5.4%	4.2%
Total	183,281	222,717	248,736	4.0%	2.2%

Source: ABS ERP

Figure 9 Sydney LGA boundary



Source: ABS Maps

3.1 Population (cont.)

3.1.1 Population trends

Pyrmont – Ultimo SA2

For this analysis, Macroplan looked at Statistical Area 2 (SA2) as a study area to observe population trends from 2011 to 2020.

Between 2011 and 2020, the population of Pyrmont–Ultimo SA2 grew by 4,422 residents to reach 24,661 in 2020 at a compound annual growth rate of 2.2%.

Pyrmont–Ultimo SA2 has a relatively young population, with those aged 0-34 making up just over 60% of the total population in 2020.

Between 2016 and 2020, residents in the age bracket 20-34 grew the most by 942 residents, followed by those residents aged 65+ (389 residents).

Table 4 Historical population trends, Pyrmont – Ultimo SA2

Age cohort	2011	2016	2020	Growth rate (2011-2016)	Growth rate (2016-2020)
0-19	2,284	2,763	2,564	3.9%	-1.5%
20-34	10,677	11,528	12,470	1.5%	1.6%
35-54	4,840	5,439	5,771	2.4%	1.2%
55-64	1,390	1,681	1,766	3.9%	1.0%
65+	1,048	1,701	2,090	10.2%	4.2%
Total	20,239	23,112	24,661	2.7%	1.3%

Source: ABS ERP

Figure 10 Pyrmont – Ultimo SA2 boundary



Source: ABS Maps

3.1 Population (cont.)

3.1.2 Socio-demographic profile

The key points to note regarding the socio-demographic profile of the Pyrmont–Ultimo SA2 and Sydney LGA population in 2016 are as follows:

- Residents in the Pyrmont–Ultimo SA 2 are young, with those aged 0-34 contributing to 61.8% of the population, somewhat higher than that of Sydney LGA (57.5%).
- The average household income is slightly higher in Pyrmont– Ultimo SA2 when compared to that of Sydney LGA .
- The majority of residents living in Pyrmont–Ultimo SA2 are born overseas (67.5%).
- The median age of those living in Pyrmont–Ultimo SA2 is slightly younger than that of Sydney LGA.
- Group households are the predominant family type in Pyrmont– Ultimo SA2 and Sydney LGA, accounting for 40.9% and 32.9% of families, respectively.
- Dwellings in Pyrmont–Ultimo SA2 and Sydney LGA are predominantly flats or apartments (92.1% and 78.0%) respectively) with the majority of residents primarily renting in both the SA2 and LGA.

Table 5 Socio-demographic profile, 2016

ABS C	ensus 2016	
	Pyrmont – Ultimo SA2	Sydney LGA
Census population	21,657	208,375
Average household size	2.2	2.0
Average household income (weekly)	\$1,941	\$1,926
Age distribution (% of population)		
Aged 0-19	11.8%	10.8%
Aged 20-34	50.0%	46.8%
Aged 35-54	24.0%	26.6%
Aged 55-64	7.2%	7.7%
Aged 65-74	4.8%	5.0%
Aged 75-84	1.8%	2.3%
Aged 85+	0.5%	0.9%
Median age	30	32
Birthplace (% of population)		
Australian born	32.5%	45.1%
Overseas born	67.5%	54.9%
Family type (% of household)		
Couple without children	23.0%	24.3%
Couple with children	9.8%	8.8%
One parent family	4.2%	3.8%
Lone person	22.2%	30.1%
Group household	40.9%	32.9%
Dwelling structure (% of dwellings)		
Separate house	0.8%	2.0%
Semi-detached, row/terrace house/		
townhouse	7 1%	19.9%
Flat or apartment	92.1%	78.0%
	02.170	10.070
Dwelling tenure (% of dwellings)		
Dwelling tenure (% of dwellings) Owned/buying home	33.8%	35.3%

3.2 Employment

3.2.1_Employment overview

For the employment assessment, Macroplan looked at the Pyrmont-Ultimo SA2.

Transport for NSW is projecting that the LGA's workforce will increase from 43,444 in 2016 to almost 52,081 in 2041. The 2016 Transport for NSW data indicates that the main sectors of employment in the SA2 are within 'Information Media and Telecommunications' (9,225 workers), 'Professional, Scientific and Technical Services' (7,404 workers) and 'Education and Training (6,680 workers).

The industry sectors that experienced the largest growth from 2011 to 2016 are within 'Education and Training (+2,027 workers), 'Accommodation and Food Services' (+1,152 workers) and 'Information Media and Telecommunications' (+909 workers). This is reflective of the presence of major company headquarters such as Google and the University of Technology Sydney.

Into the future, it is expected that Information Media and Telecommunication and Education and Training will continue to be the major growth industries.

Table 6 Industry by employment, place of work, Pyrmont-Ultimo SA2, 2016

	Number of workers 2011	Number of workers 2016	Change (2011 - 2016) (no.)	Change (2011-2016) (%)
Agriculture, Forestry and Fishing	4	19	15	344.4%
Mining	19	0	-19	-100.0%
Manufacturing	463	288	-175	-37.9%
Electricity, Gas, Water and Waste Services	226	369	143	63.3%
Construction	2,385	1,762	-623	-26.1%
Wholesale Trade	1,071	1,226	155	14.5%
Retail Trade	1,241	2,049	808	65.1%
Accommodation and Food Services	1,860	3,012	1,152	62.0%
Transport, Postal and Warehousing	625	723	98	15.6%
Information Media and Telecommunications	8,316	9,225	909	10.9%
Financial and Insurance Services	1,521	1,010	-511	-33.6%
Rental, Hiring and Real Estate Services	468	755	288	61.5%
Professional, Scientific and Technical Services	6,817	7,404	587	8.6%
Administrative and Support Services	1,255	1,343	88	7.0%
Public Administration and Safety	579	795	216	37.3%
Education and Training	4,653	6,680	2,027	43.6%
Health Care and Social Assistance	672	844	173	25.7%
Arts and Recreation Services	4,863	5,114	250	5.1%
Other Services	702	826	123	17.6%
Total	37,741	43,444	5,703	15.1%

Source: TPA, Macroplan

3.2.2 Employment projections

Macroplan assessed forecasted jobs growth (Travel Zone Projections 2019 - TZP19), released September 2020 as a basis for projecting future office demand.

Job growth forecasts are based on TZP19 release and are presented in Table 6.

In terms of commercial space (office/commercial space), the following sectors are likely to have a significant influence on the evolution of the SA2 in the next 20 years to 2041:

- Information media and telecommunications (+1,142 jobs) •
- Education and training (+1,057 jobs) •
- Arts and recreation (+667 jobs) ٠
- Professional, scientific and technical services (+553 jobs) •
- Healthcare and social assistance (+542 jobs) •

Overall, there is projected to be around 24,409 office-based jobs in the SA2 by 2041.

	2021 (e)	2031 (f)	2041 (f)	2021-31	2021-41
	No	No	No	Total	Total
	NO. NO.		NO.	change	change
Agriculture, forestry and fishing	23	32	41	9	19
Mining	0	0	0	0	0
Manufacturing	286	291	312	5	27
Electricity, gas, water and waste	361	373	302	12	31
services	001	010	002	12	51
Construction	2,054	2,116	2,184	62	130
Wholesale trade	1,213	1,260	1,363	47	150
Retail trade	2,141	2,172	2,291	31	150
Accommodation and food services	3,047	3,194	3,370	147	323
Transport, postal and warehousing	731	746	754	15	23
Information media and	0.262	0 523	10 404	261	1 1/2
telecommunications	3,202	3,525	10,404	201	1,142
Financial and insurance services	975	1,078	1,219	103	244
Rental, hiring and real estate services	787	826	891	39	104
Professional, scientific and technical	8 869	8 906	9 4 2 2	37	553
services	0,000	0,000	5,422	57	555
Administrative and support services	1,330	1,434	1,559	105	230
Public administration and safety	808	863	914	55	105
Education and training	7,415	7,466	8,472	51	1,057
Health care and social assistance	1,018	1,269	1,559	251	542
Arts and recreation services	5,230	5,387	5,897	158	667
Other services	867	960	1,038	93	171
Total employment	46,416	47,898	52,081	1,482	5,665
Total 'white-collar' employment	30,464	31,366	34,440	902	3,976
Total office based 'white collar'	22,032	22,631	24,409	599	2 377

Source: TPA, Macroplan

employment

3.2 Employment (cont.)

Commercial Market Peer Review Blackwattle Bay Precinct

Table 7 TPA employment projections, Pyrmont-Ultimo SA2, 2021-41

3.2 Employment (cont.)

3.2.3 Business counts

In 2021 there were 4,220 businesses operating in Pyrmont-Ultimo SA2, 261 more than in 2017. Most growth was seen in businesses employing 1-4 employees (+179 businesses) followed by non-employing businesses (+75). Total businesses employing 20-199 employees and 200+ employees decreased by 3, respectively.

From an industry perspective, 'professional, scientific and technical services' businesses grew the most (+131) followed by 'transport, postal and warehousing' (+69), 'rental, hiring and real estate services' (+50).

In 2019 the key industry businesses operating in Pyrmont-Ultimo SA2 included:

- Professional, scientific and technical services (1,076 businesses);
- Rental, hiring and real estate services (835 businesses);
- Financial and insurance services (292 businesses);
- Construction (269 businesses); and
- Accommodation and food services (247 businesses).

Table 8 Business counts by industry and size, Pyrmont-Ultimo SA2, 2021

	Non employ- ing	1-4 emp.	5-19 emp.	20-199 emp.	200+ emp.	Total
	No.	No.	No.	No.	No.	No.
Agriculture, forestry and fishing	10	3	3	0	0	16
Mining	5	6	0	0	0	11
Manufacturing	36	27	7	0	0	70
Electricity, gas, water and waste services	3	3	0	0	0	6
Construction	174	73	13	9	0	269
Wholesale trade	75	67	19	11	0	172
Retail trade	91	94	28	8	0	221
Accommodation and food services	55	98	77	17	0	247
Transport, postal and warehousing	160	29	7	6	0	202
Information media and telecommunications	53	42	20	15	0	130
Financial and insurance services	192	79	15	6	0	292
Rental, hiring and real estate services	741	80	10	4	0	835
Professional, scientific and technical services	496	422	114	44	0	1,076
Administrative and support services	98	79	29	11	0	217
Public administration and safety	8	3	0	0	0	11
Education and training	38	30	8	8	3	87
Health care and social assistance	93	71	15	3	0	182
Arts and recreation services	31	16	6	3	0	56
Currently unknown	50	41	19	4	0	114
Other services	3	0	3	0	0	6
Total	2,412	1,263	393	149	3	4,220

Source: TPA, Macroplan

4. Commercial market assessment

4.1 Commercial market overview

4.1.1 Study area

For the purpose of this study and the market demand assessment, 'Pyrmont-Ultimo' SA2 (Pyrmont Peninsula) is selected as the study area.

It has regard for those suburbs and areas surrounding the Blackwattle Bay precinct and new Pyrmont metro station that forms a likely catchment for new commercial floorspace delivered for 3,300 to 6,300 jobs at the subject precinct*.

Map 2 Study area – commercial/office land uses



* excluding 700 operational jobs from new Sydney Fish Market. Source: Macroplan

4.1.2 Covid impact

TPA released TZP19 in 2020 which was developed in 2019, prior to the COVID-19 pandemic. As these projections are not adjusted for COVID-19, the NSW Government's 2019 forecasts are likely to overestimate future job generation. The COVID-19 pandemic has had a major impact on net overseas migration (NOM) into Australia and, with Greater Sydney a major destination for new migrants into Australia, the impact on growth in Greater Sydney is substantial, particularly in the short term.

A smaller population means local demand for goods and services will be smaller thus requiring less labour. The starting assumption in this scenario (i.e., post-Covid) is that the impact of COVID-19 has a broadly even impact on growth by area.

For Greater Sydney as a whole, considered from both a supply of and demand for - labour perspective, lower population growth should translate fairly directly to lower employment growth. The starting assumption in this alternative scenario is that the impact of COVID-19 has a pro rata reduction in employment across time and that has a broadly even impact on growth by area. That is, growth in Pyrmont-Ultimo SA2, and in turn in Greater Sydney, is lowered by the same proportion.

Given the Federal and State Government's commitment to the Sydney Metro and the new airport, there is some potential for the other employment hubs (e.g., Parramatta CBD, Macquarie Park) to attract a larger share of the 'lower growth' (Covid impact). Furthermore, there are also risks to the downside due to external and domestic factors (e.g., economic downturns & current tight economic conditions).

4.1 Commercial market overview (cont.)

4.1.3 Industries in Pyrmont

The study area has seen consistent growth in jobs and economic activity over the last 20 years, while preserving many of the unique aspects of the area. The area is known for the presence of innovative and creative businesses and its tourism and entertainment offerings. The below chart (Figure 9) illustrates the industry sector clustering in Pyrmont using a location quotient analysis, which highlights which industries Pyrmont is best known for. Figure 10 localises the industry clustering within the precinct.

There is a strong representation of media with the likes of the ABC and Network 10 having an office presence in the Peninsula. There is an education cluster in the south of the Peninsula, which is home to both UTS and TAFE. The tourism and entertainment offerings are centred around the waterfront land in Darling Harbour. In terms of commercial offices, the Peninsula is currently home to Google and a range of small-to-medium-sized professional services businesses.

Figure 9 Industry cluster analysis of Pyrmont relative to NSW (2018)







Source: Hassell

Commercial Market Peer Review Blackwattle Bay Precinct

4.1 Commercial market overview (cont.)

4.1.4 Current state of floorspace

Over the past 20 years, Pyrmont has evolved into one of the largest 'city fringe' commercial office precincts in Sydney. Although still dominated by residential land use, Pyrmont is home to an array of commercial uses across industry sectors in addition to being an entertainment and tourism hub.

Table 9 provides an overview of the current state of floorspace utilisation within Pyrmont on a sector-by-sector basis and identifies how these uses have evolved over the 10-year period from 2007 to 2017.

Over the 10-year period from 2007 to 2017, residential remained the dominant land use within the Peninsula, accounting for some 939,000 sqm (or 26%) of total floorspace. This represented an increase of almost 187,000 sqm over the period, up 25% from 752,000 sqm in 2007. The second and third largest increases in floorspace by quantum were for common area and parking uses respectively – common area increased by more than 159,000 sqm (an increase of 46% from 2007) to 504,000 sqm, while parking grew by about 89,000 sqm (an increase of 16% from 2007) to 655,000 sqm.

While total office floorspace fell by about 2.2% (or 9,927 sqm) to 433,600 sqm, the total number of jobs within Pyrmont increased by more than 60% over the same period, resulting in a significant reduction in total office employment density by about 40% to an overall density of 16 sqm per job in 2017. This was largely underpinned by enhanced efficiencies in office floor plate configurations via the adoption of activity-based working and flexible workspaces.

Table 9 Floorspace use by type, Pyrmont Peninsula

	2007	2017	Change (2007-17) (sqm)	Change (2007-17) (%)
Residential	751,600	938,572	186,972	24.9%
Parking	566,755	655,495	88,740	15.7%
Common area	344,796	504,139	159,343	46.2%
Office	443,513	433,586	-9,927	-2.2%
Utilities	169,246	202,158	32,912	19.4%
Entertainment / leisure	128,665	201,794	73,129	56.8%
Storage	147,597	196,842	49,245	33.4%
Visitor accommodation	136,736	159,599	22,863	16.7%
Community	62,843	98,394	35,551	56.6%
Other infrastructure	107,781	62,849	-44,932	-41.7%
Restaurant / eating	50,382	80,826	30,444	60.4%
Shop / showroom	44,814	40,382	-4,431	-9.9%
Industrial	52,817	29,280	-23,537	-44.6%
Transport	13,383	20,777	7,394	55.2%
Total	3,020,926	3,624,691	603,765	20.0%

Source: City of Sydney (2017), Floorspace and Employment Survey

4.1 Commercial market overview (cont.)

4.1.4 Current state of floorspace (cont.)

The 10 years to 2017 saw the departure of many finance and financial services businesses (down 75%) from Pyrmont. Conversely, a number of Information and Communication Technology (ICT) and professional and business services firms expanded their footprint, particularly in mid 2009 when Google officially opened its Sydney headquarters at Workplace, with a commitment of 10,000 sqm.

Google has since expanded its occupancy within Pyrmont through the lease of 22,000 sqm at 1 Darling Island Road and the acquisition of 38-42 Pirrama Road (25,000 sqm office building) in 2018.

On the other hand, two major media companies from the ICT sector have left or are in the process of leaving Pyrmont:

- Seven Network (currently occupying approximately 22,000 sqm in South Eveleigh*), who moved its head office to South Eveleigh in 2018.
- Nine (which previously occupied 18,500 sqm in Pyrmont and will occupy 25,000 sqm in North Sydney**), including the Sydney Morning Herald and Australian Financial Review, which have moved to North Sydney in the second half 2020.
- Accordingly, the internal floorspace occupied by the ICT sector post-2017 is likely to be lower than what's shown in the Figure 11.



Figure 12 Pyrmont internal floor space (office) by industry (total sqm)

Source: City of Sydney (2017), Floorspace and Employment Survey

* Source - https://www.southeveleigh.com/about/work-at-south-eveleigh

**Source - https://www.realcommercial.com.au/news/channel-9-plans-move-to-1bn-north-sydney-tower

4.2 Commercial market outlook

4.2.1 Existing office buildings and recent office development

Tables 10 & 11 provide an overview of the current state of existing office floorspace development within the Pyrmont Peninsula and the surrounding area. It also identifies a number of upcoming or recently completed large-scale office development sites and significant employment hubs deemed relevant to future demand for employment floorspace within the precinct.

Notably, the majority of the buildings in Pyrmont are five to seven storeys high with floor plates ranging from 2,000 sqm to 5,000 sqm in flexible, campus style configurations. By comparison, the new and upcoming CBD office developments are significantly taller, denser and have floor plates ranging from 1,300 sqm to 2,500 sqm.

Table 10 Completed/Potential major office developments

	Floor area	Grade	Completion	Key tenant(s)
	sqm	Indicative	Year	-
180 George Street	55,000	Premium	2022	Salesforce
10 Carrington Street Sydney	59,000	Premium	2021	Linkedin
2 Market Street, Sydney	37,154	Premium	2021	Amazon
Cockle Bay Wharf, Sydney	63,000	Premium	2026	n.A
Central Station, Eveleigh	60,000	А	2025	Atlassian
Harbourside Shopping Centre	87.000	n.a	2025	n.a
Redevelopment	,			
Sydney Fish Market, Pyrmont	n.a	n.a	n.a	n.a
Powerhouse Museum, Ultimo	n.a	n.a	n.a	n.a

Source: RP Data, Knight Frank, JLL, Colliers, Cushman Cushman and Wakefield, CBRE

Table 11 Pyrmont internal floor space (office) by industry (total sqm)

	Floor area Grade		Key tenant(s)
	sqm	Indicative	-
19 Harris Street, Pyrmont	12,568	n.a	Thompson Reuters, Loreal, Design WorldWide Partnership
21 Harris Street, Pyrmont	18,888	А	Publicis Groupe, Campfire
6 Darling Island Road, Pyrmont	25,000	А	Google
38-42 Pirrama Street, Pyrmont	16,320	n.a	Google
1 Darling Island Road, Pyrmont	22,200	А	Google
48 Pirrama Street, Pyrmont	16,300	А	Google
100-130 Harris Street, Pyrmont	26,879	А	WeWork, Domain, GoCatch, Naked Communications
63-79 Miller Street, Pyrmont	6,750	n.a	n.a
65 Pirrama Street, Pyrmont	15,941	A	John Holland Group, Aust Communications & Media Authority
60 Union Street, Pyrmont	19,800	А	Coles, American Express
55 Pyrmont Bridge Road, Pyrmont	15,000	n.a	Digital Pacific, Verizon, WOTSO
235 Pyrmont Street, Pyrmont	10,399	А	JWT, Think Educaion, Village Roadshow
45 Jones Street, Ultimo	12,878	А	J&J, Sheridan, TOGA
100 Broadway, Chippendale	5,450	А	UTS (Grad School of Health)

Source: RP Data, Knight Frank, JLL, Colliers, Cushman Cushman and Wakefield, CBRE

4.2 Commercial market outlook (cont.)

4.2.2 Key market indicators

Table 12 provides a snapshot of the current state and recent trends of the office market in Pyrmont and how it compares to the Sydney CBD.

The COVID-19 outbreak has impacted demand for office space in Sydney. Between 2019 and 2022, Macroplan have observed a rise in incentives in an attempt to encourage leasing activity in the market. Despite this face rents and outgoings are holding but the increase in incentives is negatively impacting effective rents (from 15-20% to 30-35%). Overall, private sector demand has been subdued as tenants assess workplace utilisation (i.e. more staff working from home). Government demand has partially offset the decline in private sector demand.

This trend has been mirrored in Pyrmont (and Ultimo), as the relatively small size of the market and high proportion of small to medium sized enterprises (SME's) make the office market vulnerable to economic shocks.

Table 12 Pyrmont internal floor space (office) by industry (total sqm)

	Pyrmont	Sydney CBD		
	-	Prime	Secondary	
Total office stock*	400,000	3,185,000	1,980,000	
Vacancy rate	9-10%	8-9%	10-11%	
Average face rent (\$/sqm p.a)	\$650-\$950	\$1,100 - \$1,300	\$850 - \$900	
Average incentives	30-35%	30-35%	30-35%	
Average indicative yield	4.75-5.25%	4.25-4.75%	4.75-5.25%	
Average effective rent (\$/sqm p.a)	\$450-\$650	\$750 - \$870	\$570 - \$620	

* Indicative Commercial Market Peer Review Blackwattle Bav Precinct

Review Source: RP Data, Knight Frank, JLL, Colliers, Cushman Cushman and Wakefield, CBRE

4.3 Commercial floorspace demand

4.3.1 Official government projections & Covid impact

TPA released TZP19 in 2020 which were developed in 2019, prior to the COVID-19 pandemic. As these projections are not adjusted for COVID-19, the NSW Government's 2019 forecasts are likely to overestimate future job generation. The COVID-19 pandemic has had a major impact on net overseas migration (NOM) into Australia and, with Greater Sydney a major destination for new migrants into Australia, the impact on growth in Greater Sydney is substantial, particularly in the short term.

A smaller population means local demand for goods and services will be smaller thus requiring less labour. The starting assumption in this scenario (i.e., post-Covid) is that the impact of COVID-19 has a broadly even impact on growth by area.

For Greater Sydney as a whole, considered from both a supply of and demand for - labour perspective, lower population growth should translate fairly directly to lower employment growth. The starting assumption in this alternative scenario is that the impact of COVID-19 has a pro rata reduction in employment across time and that has a broadly even impact on growth by area. That is, growth in Pyrmont-Ultimo SA2, and in turn in Greater Sydney, is lowered by the same proportion.

4.3 Commercial floorspace demand (cont.)

4.3.2 Commercial floorspace demand forecast

The forecast demand for commercial space is illustrated in Table 13.

- Of the 8,637 new jobs forecast to be located in Pyrmont-Ultimo SA2 from 2016 to 2041, around 6,383 are expected to be 'whitecollar', 3,876 are expected to be 'office based' and 2,507 being located in health and education (pre-covid).
- The slower population growth trajectory which COVID-19 has brought also translates to lower employment growth across the Sydney economy. Macroplan estimated that there will be an additional 3,247 'office-based' workers and 2,106 'health & edu' workers between 2016 and 2041 (post-COVID).
- Based on the assumed employment density (18 sqm NLA per 'office-based' employee & 30 sgm NLA per 'health & edu' employee) this would generate demand for about 120,000 sgm NLA of commercial space (i.e., 58,446 + 63,180) in the Pyrmont-Ultimo SA2 from 2016 to 2041.
- It is noted that there is a trend towards having extra room in the workplace as a consequence of COVID-19. This could result in new commercial buildings having a higher floorspace provision of around 21 sqm NLA per 'office-based' employee & 40 sqm NLA per 'health & edu' employee. Assuming the greater floorspace requirement, employment growth would generate demand for more than 150,000 sqm NLA of commercial space (i.e., 68,187 + 84,240) in the Pyrmont-Ultimo SA2 from 2016 to 2041.
- Based on Macroplan's assessment and the Government's employment forecasts, it is expected that Pyrmont-Ultimo SA2 could achieve a per annum take-up rate of 4,800 to 6,000 sg.m NLA per annum (from 2016 to 2041).

Table 13 Commercial floorspace demand forecasts*, Pyrmont-Ultimo SA2

	2016 (a)	2021 (e)	2031 (f)	2041 (f)
Pre-COVID employment forecast (No.)		(-)		
Total employment, all industries	43,444	46,416	47,898	52,081
Total 'office based' worker	20,533	22,032	22,631	24,409
Additional 'office-based' worker cumulative		1,499	2,098	3,876
Total 'health & edu' worker	7,524	8,432	8,735	10,031
Additional 'health & edu' worker cumulative		908	1,211	2,507
Post-COVID employment forecast (No.)	2016	2021	2031	2041
Covid Impact (i.e., impacts on growth)	(a)	(e) 20-23% (16-21)	(T) 17-20% (21-31)	(T) 8-13% (31-41)
Additional ' office-based' worker cumulative		1,154	1,647	3,247
Additional 'health & edu' worker cumulative		699	947	2,106
Post-COVID floorspace demand forecast (NLA, sqm)	2016 (a)	2021 (e)	2031 (f)	2041 (f)
'office-based' floorspace demand cumulative (18 sqm per worker)		20,772	29,646	58,446
'office-based' floorspace demand cumulative (21 sqm per worker)		24,234	34,587	68,187
'health & edu' floorspace demand cumulative (30 sqm per worker)		20,970	28,410	63,180
'health & edu' floorspace demand cumulative (40 sqm per worker)		27,960	37,880	84,240

Source: TPA, Macroplan

(a) – actual, (e) – estimate, (f) - forecast

* It is important to note that the Government's projections are based on assumptions of what is known at the time and stated policy objectives. In line with that, the current employment projections were made on the basis of known transport infrastructure developments at the time, and on the basis of a desired policy mix of residential and non-residential development. In Macroplan's view, the full potential of the Blackwattle Bay Precinct and Pyrmont, and the impact of Sydney Metro West might not be fully captured by the Government's employment projections. Macroplan

5. Conclusion
5.1 Market fundamentals

5.1.1 Accessibility & connectivity

Blackwattle Bay precinct has some potential to attract some commercial activities over time. The precinct is currently exposed to a range of important amenities including Sydney light rail and the new metro station at Pyrmont.

However, Macroplan's view is that the precinct, particularly the subject site (i.e., the existing Fish Market site) is still shown as a detached part of the Pyrmont office market, isolated and disconnected from wider markets.

The Western Distributor imposes a clear division between the streets and spaces of Pyrmont and the sites at the edge of the bay. On-ramps and undercroft areas of the Western Distributor create a physical and psychological barrier, impeding connectivity and access.

Three private landowner parcels lie between the foreshore and Bank Street, which are constrained by the Western Distributor.

5.1.2 Existing site ownerships

Blackwattle Bay precinct comprises of the following four sites:

- Existing Fish Market
- New Sydney Fish Market
- Private landowners
- Bank Street open space

Only 2 of the above listed sites have the potential for commercial development, namely the existing Fish Market site and the site owned by private landowners.

The subject site (i.e., existing Fish Market site) is under a single land ownership (i.e., the NSW Government). Future site development will have the advantage of being owned by a single owner.

Moreover, the subject site is also large in terms of land mass, situated between two light rail stops, and has better exposure to the main arterial road (i.e., Western Distributor A4/M4) as opposed to the land that is under three private ownerships.

5.1 Market fundamentals (cont.)

5.1.3 Affordability is important

Pyrmont will rely on the tenants moving out of the Sydney CBD depending on rental relativities with non-CBD locations (i.e., suburban markets). Corporates and businesses that can afford to pay for the privilege of being in the CBD locations will stay there on a permanent basis, but others will be forced out during periods of surging rents. Therefore, affordability will be a primary factor in the shift in demand towards affordable commercial floorspace as these potential tenants are arguably the most price sensitive buyers.

A key point of differentiation for the 'city fringe' markets is affordability, and this is consistent across the Peninsula and comparators (i.e., Ultimo, Eveleigh).

Net face rents of Grade A office spaces in Pyrmont are typically leased at rents approximately 25-35% lower than prime Sydney CBD rents - and are approximately equivalent to secondary office floorspace within the CBD. The rental gap against the CBD has remained relatively stable historically. This is a critical factor that will drive the presence of anchor tenants and small businesses in the area.

5.1.4 More competition arising

Macroplan's assessment indicates that the office supply pipeline for Pyrmont remains limited, however, more than 400,000 sqm is expected to come online over the next three years within Sydney CBD, with most of these new developments achieving precommitments of over 50%.

Furthermore, the next wave of new office supply is expected to come to market from 2024 onwards and will predominantly come from many Over Station Developments (OSD) - Martin Place, Parkline Place, potentially around the new metro station at Pyrmont as well.

Notably, the Tech Central precinct (Eveleigh) will be anchored by a 75,000 sqm commitment from Atlassian will drive the expansion of the Sydney CBD office market to its Southern boundaries and will be poised as a major competitor to the Pyrmont office market, particularly media, IT and professional businesses. This will effectively have significant impact on the price and commercial take-up in the Blackwattle Bay precinct generally.

5.1 Market fundamentals (cont.)

5.1.5 Strong strata office demand

As a fringe offering to the Sydney CBD, the Pyrmont Peninsula has managed to attract and retain small and medium sized businesses. It is home to 1,700 businesses that produce over \$15 billion per annum in revenue.

Small businesses, defined as those that have less than 20 employees, make up 90% of all businesses in Pyrmont. The area is dominated by small and medium professional services and tourism and entertainment businesses. The average size of a professional services business in Pyrmont is about 10 employees. This is indicative of the appeal of Pyrmont to new small and medium enterprises that typically operate from strata office space.

The addition of new commercial space at Blackwattle Bay (i.e., the existing Fish Market site) needs to be relevant to a broad range of employment trends and opportunities at Pyrmont. Macroplan's view is that Pyrmont will continue to attract interest predominantly from corporate businesses, health & education related industries, and a range of SMEs seeking to purchase (or lease) strata space. Corporate finance, headquarters, and government-oriented demand, on the other hand, is expected to dominate demand for space at Sydney CBD.

5.1.6 Key trends & implications for Pyrmont

Macroplan also learnt that one of the biggest challenges for the commercial development within major employment hubs in Sydney has been a lack of amenity and urban infrastructure. In Macroplan's view there is not sufficient necessary retail and personal services for professional 'white collar' workers, because there was no critical mass required to support these investments.

Macroplan's research points to the Parramatta and Macquarie Park examples as a comparative model for successful high-density office development. Many of these successful office developments underpinned by high-quality major tenant pre-commitment. These types of major tenants seek quality fit outs and better terms/prices, but also like to be in a vibrant, cosmopolitan, commercial and residential precinct, with people attracted to the area to work and play. From these nationally recognised precincts and employment hubs, residential and retail development were seen as important subcomponents, which created enough critical mass in employment and office development.

Thriving mixed use precincts require varying degrees of ground level retail activation. The new Sydney fish market will provide that anchor to the subject site and Blackwattle Bay precinct generally, however, potential tenants and corporates typically enjoy the flexibility of a variety of offerings, including F&B and eateries, onsite. The subject site may benefit in terms of commercial activation if it can achieve vibrancy and amenity onsite. The residential population nearby will provide this anchor and sustain demand during weekends for retail activation, when the working population is not present.

Consumer and worker preferences are shifting toward more urbanoriented environments and more people are placing a high priority on proximity to entertainment facilities, cultural infrastructure, and social contacts. The activation of the subject precinct will also appeal more to the 'Millennial' generation, who are central to the future workforce, is more closely associated with proximity to urban amenities such as eateries, retail, cultural, and social venues. The activation will allow a greater level of entry by commuter reliant businesses and consumers, and many small businesses seeking a strata office, potentially more co-working space.

5.2.1 Key strengths

- **Geography and location** waterfront land with access to the Sydney CBD and the working harbour, as well as being part of the innovation corridor.
- Industry clusters an innovation cluster with key anchor tenants from the media, ICT and professional services sectors contributing to the local economy. A large and established higher education and tertiary education presence with the UTS and TAFE in Ultimo. This cluster is also supported by the tourism and entertainment industry, as previously outlined, and is supported by a diverse range of accommodation, dining and retail offerings.
- **Amenity** attractive to residents, workers and visitors through its vibrancy, heritage buildings, recreational facilities, village/community feel, green space, culture and history.

5.2.2 Key opportunities

- Infrastructure investment investment in a Sydney Metro West station, which will increase accessibility and connectivity to areas including the CBD, the Bays Precinct, Sydney Olympic Park, Parramatta and Westmead.
- **Innovation and collaboration** access to higher education and tertiary institutions offers co-location, collaboration, research and development, and knowledge transfer opportunities with businesses and other innovation areas.
- **Improving accessibility** by extending the Sydney Harbour Foreshore Walk to the Sydney Fish Market and restoring the Glebe Island Bridge.

5.2.3 Key weaknesses

- **Physical and psychological barrier** the Western Distributor imposes a clear division between the streets and spaces of Pyrmont and the sites at the edge of the bay. On-ramps and undercroft areas of the Western Distributor create a physical and psychological barrier, impeding connectivity and access.
- Lack of interest Macroplan's observation of the current commercial stocks within Pyrmont, particularly near the Blackwattle Bay precinct, generally falls into 'support office' and/ or secondary office (with another primary land use) categories. Pyrmont has some potential for more of the 'Investment grade office' category (with large floorplate), albeit, it has higher risk associated to such development in non-Sydney CBD area. Hence, Macroplan envisages that the majority of the Australian real estate investment trusts (A-REITs), which owns the majority of investment grade office assets, would consider Pyrmont outside their investment profile.
- **Strata market** attractive to small to medium businesses and professional services, but not for major tenant seeking large floorplate. The typical size of a professional services business in Pyrmont is about 10 employees or less.
- **Industry clusters** whilst there is a general cluster of media and other start-up businesses within the Pyrmont Peninsula, the existing Sydney Fish Market site is not defined by major industry clusters (corporate, headquarters, Government/public sector).

5.2.4 Key threats

- Heavy reliance it is noted that the cluster of adtech jobs is currently heavily reliant on Google as the main anchor tenant. Other large-to-medium companies are already located elsewhere, including Salesforce and the Trade Desk in the Sydney CBD and Adobe at Darling Park. This could make it difficult to maintain the adtech clustering if Google was to leave the Peninsula and could have a significant impact on the price and commercial take-up at the Blackwattle Bay precinct.
- Future competition (Metro station) The new Metro station will improve the connectivity of Pyrmont to the Sydney CBD & Western Sydney, with a high frequency service and shorter travel times (about 20 minutes). This transport infrastructure enhances the long-term demand potential for the office area to grow its workforce as new higher-density office buildings are developed in Pyrmont – but particularly centred around the Metro station. This will have significant impact on the price and commercial take-up at the Blackwattle Bay precinct.
- Future competition (OSD) New office supply is expected to come to market from 2024 onwards and will predominantly come from many Over Station Developments (OSD) in conjunction with the Tech Central precinct (Eveleigh). Particularly, the Tech Central precinct will be poised as a major competitor to the Pyrmont office market, attracting media, IT and professional businesses.
- **Planning constraints** planning constraints (and physical barriers) to growth may be an issue when attracting anchor tenants and other businesses. Planning constraints and commercial development pressures may not align well with the precinct's historical character.

5.2.5 Commercial floorspace demand (Blackwattle Bay)

Based on the key employment forecasts for Pyrmont (i.e, Pyrmont-Ultimo SA2), the potential additional floorspace required to accommodate the increase in workers as estimated in Section 4.3. The total additional commercial floorspace required by 2041 is within a range of 120,000 – 150,000 sqm (NLA)*.

However, even under the redevelopment scenario with less aspirational job target of circa 3,300 jobs[^] (i.e., Homes scenario: Revitalising Blackwattle Bay), the subject site development (or the whole Blackwattle Bay Precinct) has to capture at least 50% of the total estimated demand in Pyrmont.

The current state of the subject site & the Blackwattle Bay precinct indicates that it may be difficult to achieve the desired job target:

- The typical industries and businesses identified in Pyrmont will seek strata office space, not large floorplate.
- There is no defined employment/industry within Blackwattle Bay generally, clustering near the subject site or near/within the precinct itself.
- In Macroplan's view, it is highly likely that there will be more new office development or re-purposing of existing commercial space centred around the new Pyrmont Metro station.
- Furthermore, the Tech Central precinct (Eveleigh) will be poised to be a major competitor in future.

^{*} Section 4.3.2 - Commercial floorspace demand forecast

[^] which excludes the potential job creation of 700 at the new Sydney Fish Market

5.2.5 Commercial floorspace demand (Blackwattle Bay) (cont.)

Macroplan's preliminary view is a cluster within a range of 23,196 to 32,213 sqm (NLA)* commercial space could be supported in the Blackwattle Bay precinct (18-21 sqm NLA office worker, 30-40 sqm 'health education' worker) and potentially accommodating a total of about 1,030 to 1,144 'white collar' workers (642 - 713 'office-based' & 388 - 431 'health & education'). This would be equivalent to the precinct achieving about 20% market share.

Figure 13 Pyrmont-Ultimo SA2 by Travel Zone (TPA)



Table 14	Projected of	fice demand	, Blackwattle	Bay precinc
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ravel one ΓΡΑ)	I∠ name (TPA)	Projected 'office' job growth, 16-41	% of projected job growth captured by subject site^	Projected job growth captured by subject site, (no.)+	Projected 'H&E' job growth, 16-41	% of projected job growth captured by subject site^	Projected job growth captured by subject site, (no.)+
151	Pyrmont_Darling Island	+313	<5%	14-16	+34	35-40%	12-13
152	John St Square MLR	+402	35-40%	145-161	+75	45-50%	34-38
153	Fish Markets MLR	+171	90-100%	145-161	+32	90-100%	28-32
154	Hardwood St	+65	<5%	<3	+8	45-50%	<4
155	Experiment St	+84	45-50%	38-42	0	80-90%	0
156	Wentworth Park MLR	+146	80-90%	118-131	+63	80-90%	51-57
157	Powerhouse Museum Ultimo	+204	20-25%	46-51	+133	45-50%	60-67
158	Broadway Shopping Centre_Glebe_Mount ain St and Small St	+424	<5%	19-21	+395	25-30%	107-119
159	UTS_Ultimo_West	+153	<5%	7-8	+1,169	<5%	53-58
160	ABC Ultimo Centre	+392	<5%	18-20	+100	<5%	<5
186	Darling Island_Pyrmont Park	+238	9-10%	21-24	+26	35-40%	9-10
187	City Star Casino	+656	9-10%	59-66	+70	35-40%	25-28
Pyrmont-Ultimo SA2		+3,247	20-22%	642-713	+2,106	15-18%	388-431

Source: TPA, Macroplan

* assuming different employment density per worker i.e., 18-21 sqm NLA per 'office-based' worker, 30-40 sqm NLA per 'health education' worker Please note that we derived the above numbers as following: 18 x 642 + 30 x 388 = 23,196; 21 x 713 + 40 x 431 = 32,213.

+ Indicative, Macroplan assumption (based on assumed % of job growth) ^ Indicative, Macroplan assumption (based on this peer review assessment)

Source: Macroplan

Commercial Market Peer Review Blackwattle Bay Precinct

5.2.5 Commercial floorspace demand (Blackwattle Bay) (cont.)

Based on Macroplan's assessment (Table 14), it is expected that Blackwattle Bay precinct could, from 2016 to 2041, achieve a per annum take-up rate of between 950 sqm and 1,200 sqm NLA per annum* (23,196 to 32,213 sqm NLA). Hence, it is highly unlikely that a net absorption of more than 100,000 sqm commercial GFA would be achievable at the subject site without a major government investment or commitment.

Macroplan also notes that the take-up of commercial/office space is subject to severable variables and factors including (but not limited to):

- % of pre-commitment.
- Securing large tenant(s).
- Amenities and urban infrastructure.

Macroplan's assessment suggests that there are many small businesses, such as tech, media and creative firms, seeking a strata office or flexible workspaces in Pyrmont, hence the demand from smaller tenants is strong.

However, a distinction needs to be made between activity at the smaller end of the market and demand from tenants that will grow the net office space provided within the market.

Commercial Market Peer Review Blackwattle Bay Precinct

Tenants with smaller footprint requirements are an important part of commercial markets, however they do not drive new office development. It is very difficult to reach capacity in a major office building with lots of smaller tenants in the first instance, especially in non-CBD locations.

Therefore, the key to achieving a higher take-up rate (or net absorption) and the aspirational job target^A at the subject site is securing a major tenant or industry that can deliver the 'next big thing' at an early stage of the development. This generally requires support from different levels of Government including huge investment, infrastructure and industry engagement.

The large government land ownership within the precinct is unique and poised as a rare development opportunity in Pyrmont. The surrounding area, however, lacks a general sense of place and identity, critical mass and business clustering.

Developers (and most Australian real estate investment trusts) will only proceed with an office development once they receive **sufficient pre-commitment** from major tenants, generally needing most of the space to be accounted for before the green light will be given for development. To achieve this, generally one or more major tenants need to commit to occupying large office areas.

Large-scale development of 100,000 sqm or more in Pyrmont, such as what is proposed in the Blackwattle Bay precinct, represent a risk to developers and owners without pre-commitment from major tenants. The Government should engage with potential anchor tenants, particularly in creative media and ad-tech industries (e.g., Google), to establish long term collaboration with businesses and industry across the Blackwattle Bay precinct and Pyrmont.

^ Pyrmont Peninsula Place Strategy identified a job target of 20,000 to 23,000 in Pyrmont.

^{*} The annual take-up rate is estimated by utilising the Government's projections. It is important to note that the Government's projections are based on assumptions of what is known at the time and known land-use developments underway or planned, and strategic plans, which means any future strategies or strategic plans for Pyrmont & Blacktown Wattle Bay precinct (e.g., Investment Attraction Strategy) are not reflected in the projections.

5.2.5 Commercial floorspace demand (Blackwattle Bay) (cont.)

The creation of the new business cluster at the subject site, with large anchor tenants, will create more opportunities for start-ups and creative industries through collaboration, knowledge sharing and technology, and supply chain linkages. It will increase the attraction of the area to small and medium sized businesses, as well as other supporting land uses such as retail, which will increase demand for office space at the subject site.

Other than targeted industry development, the Government can also support the subject precinct development through:

- Attracting foreign direct investment (FDI);
- Engaging with investors and top-tier developers to facilitate the establishment or expansion of businesses and industries;
- Developing dedicated and affordable workspaces for start-ups to showcase and prototype solutions; and
- Providing flexibility for creative media and ad-tech industries in terms of permissible uses and activities (planning).

5.2.6 Residential activation is important

Residential activation can help with re-positioning the precinct to attract major office tenants. Major tenants seek quality fit-outs and better terms and prices, but most importantly, they typically prefer to be located in a vibrant, cosmopolitan and residential precinct, with people attracted to the area to work, live and play.

The subject site currently lacks a diverse, vibrant and active 24-hour day-night economy that attracts residents, workers and visitors to the area. Over time there is potential to grow visitation numbers and achieve the critical mass required to support investments in creating a resilient and vibrant place but there is a need for investment to make this happen. Investments to stimulate a day-time economy include cafes, bars, restaurants providing breakfast, lunch and afternoon trade while investments supporting the night-time economy could include restaurants, food/beverage, take-aways, pubs, clubs, entertainment and recreation facilities.

The addition of residential components can contribute to creating a vibrant and urban environment that supports safe, livable residential neighbourhoods in the Blackwattle Bay precinct. New housing and residents in the precinct will activate the area day and night, drawing visitors from near and far. Future residents can provide a strong anchor for existing and future retail shops and local businesses. Further to this, local jobs could be supported through consumption of goods and services (i.e., food catering, fresh food, food eateries and local service providers).

The integration of residential uses within the precinct will underpin a viable mix of different land uses including commercial and tourism, providing sufficient density to support amenities and services – ultimately creating a place for people to work, play and live.

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Attachment 6: Response to Atlas Urban Economics recommendations





Response to Recommendations of Land Use Appraisal, Atlas Urban Economics

INSW engaged Atlas Urban Economics (Atlas) to undertake a Land Use Appraisal to inform the Revised Precinct Plan. The report therefore is based on the 2021 Precinct Plan submitted with the SSP Study.

The concluding recommendations of the Atlas report are outlined and addressed below with the response in the RTS and Revised Precinct Plan. Importantly, Atlas note that these recommendations should be considered in the context of development feasibility and overall objectives of NSW Government. These are discussed throughout this memorandum.

Atlas Recommendation	Response		
Quantum of Commercial Office Floorspace Based on the target development horizon to 2034-35, take-up forecasts suggest BWB could accommodate 67,000sqm of office NLA by 2036. If an investment attraction strategy was implemented to support BWB, more rapid take-up of commercial floorspace could be achieved - potentially between 91,000sqm and 97,000sqm NLA. Market demand for office space is expected to accelerate and deepen as completion of the Metro station in 2030 approaches. Depending on the pace of take-up/ absorption, BWB could make a substantial contribution in the first decade (to 2036) to meeting projected demand for office floorspace in the broader Peninsula as projected in the EDS.	As outlined in section 3.2.2 of the RTS, 67,000sqm NLA office space in Blackwattle Bay (equivalent of 78,825sqm GFA). The Revised Precinct Plan proposes 107,572sqm of office space within the precinct inclusive of the new SFM. Excluding the new SFM, the precinct provisions for 91,926sqm GFA which is well in excess of the demand identified by Atlas. Government has not directed or committed to an IAS for Blackwattle Bay. The staging approach is to deliver a substantial amount of the commercial closer to and after the opening of the Metro Station so that the workers are adequately supported.		
Role of an Investment Attraction Strategy Investment attraction could facilitate greater take-up of commercial floorspace at BWB into the compressed development timeframe where completion is targeted by 2034-35. A dedicated marketing strategy, led by a Government agency, would also assist in coordination to mitigate the competitive risks posed by other precincts such as Tech Central and Bays West. The ongoing cost of such a programme should be incorporated into the financial feasibility assessment of the project.	Government has not directed or committed to an IAS for Blackwattle Bay.		
Distribution of Land Uses The Study recommends revisiting the distribution of land uses in the Precinct Plan. Commercial office uses should be tightly clustered together rather than spread across the precinct. This will focus commercial activity in a 'core' and avoid	The revised precinct plan clusters 70% (54,482sqm GFA) the office demand identified by Atlas in southeast corner of the precinct in Buildings 4, 5A, 5B, & 6. These buildings offer a variety of medium and large commercial floorplates in an urban campus setting. The anticipated timing of this cluster is aligned with the opening of the new Pyrmont metro station and sets this cluster of commercial office within 400m of the new station.		

dilution of footfall and visitation. The existing SFM site is considered an ideal location for office uses given its scale and proximity to Harris Street and the future Pyrmont Metro Station (notwithstanding a need to improve the pedestrian experience between the SFM site and the future metro station). The smaller sites along Bank Street lend themselves to retail and smaller scale commercial uses. Whilst these sites will have linkages to the Metro Station via Miller Street, these sites could face difficulty in securing and sustaining commercial occupier interest in a dispersed layout. It is recommended the quantum of commercial floorspace proposed be reduced, however ensuring activation at the ground plane and providing for small scale, boutique commercial. Residential uses should be carefully separated from commercial land uses in order to avoid land use conflicts with future office accommodation. This can be done through astute design and built form controls. Enterprise uses could be considered in pockets of the Study Area where other land uses are not appropriate, subject to traffic, urban design and financial feasibility considerations.	 The interface between residential and commercial land uses has been carefully considered particularly as it relates to separation distances and orientation (overlooking). Generally, residential land uses are located to the north of the commercial land uses. This has been done so lift cores, stairwells, amenities can be located on the northern sides of a commercial building to mitigate against solar gain. Not only will this approach assist and aligned with the proposed sustainability targets but also it minimises any direct resi/commercial interface. Furthermore, both Building 4 and PLO3-02 can a street entry/address to a major public domain corridor, Gipps St and Miller St Reserve, respectably. Only 20% (16,893sqm GFA) of the office floorspace demand identified by Atlas is located on the southern Hymix site. There are four reasons for this arrangement. 1) Hymix has stated they are a longer-term redevelopment site. This will allow them to capitalise on the established nature of the Precinct while capturing late-stage market demand. 2) The Hymix site will form part of the commercial office cluster that will be formed through the redevelopment of the City West Office Park site, which is likely to occur close in time to the renewal of the Hymix site and the City West Office Park site are located 500m from the new metro station on the emerging active transport corridor of Miller/Union St. Both Sites are also directly adjacent to the light rail stop. 4) Both the Hymix site and the City West Office Park site offer medium to large scale floorspace demand identified by Atlas is located throughout the remaining private landowner sites and offers a variety of small and medium-sized floorplates that could cater to small businesses which will benefit from the proximity to the larger corporate tenants as well as the surrounding amenity. These user types were identified in the Atlas report and in their recommendations.
Commercial Building Typologies It is challenging to isolate the floorplate sizes required by different industries as this is more a function of organisation size rather than industry. Accordingly, providing a mix of office floorplates is appropriate. [from body of report] In the early years, there should be provision of some larger floorplates (1,800sqm to 2,500sqm NLA) to attract precommitments by anchor occupiers that will enable 'bankability' and establish BWB's profile as a commercial precinct. Some smaller floorplates (800sqm to 1,200sqm NLA) should also be provided in order to attract the mix of industries and business sizes, however these will likely be taken-up in later years. This will attract the mix of industries and business sizes needed for an office precinct to be economically sustainable over the longer term.	 Almost 50,000sqm commercial office GFA is proposed for Buildings 4, 5A, and 5B. These buildings have been identified as a second stage development opportunity aligning their delivery with the 2030 opening of the Metro West line and the Pyrmont Metro station. (Refer to the indicative Staging Plan in the Design Code.) The second stage timing also provides the developer with time to pre-let the commercial space within the buildings to make the development 'bankable'. Atlas has predicted take up rate of 6,000sqm NLA (approx. 7,060sqm GFA) per annum meaning it will take approximately 5 years for 70% of the floorspace to be leased. Financial institutions usually require between 50% and 70% of a commercial office building to be pre-leased before they will provide a construction loan. Buildings 4, 5A, and 5B offer a variety of floorplates sizes ranging from 1350sqm to 3,300sqm to attract precommitments by anchor occupiers. It is anticipated that small and medium sized office occupiers would take up most of the available office space offered in the third stage of development. PLO3-2 offers additional larger floorplate opportunities in the fourth and final stage. Floorplate sizes ranging from 1100sqm to
Pyrmont/ Ultimo's commercial profile as a well-known location for unique, 'less	3600sqm are available.

corporate' type office accommodation should be leveraged upon. This will be important in a post-COVID-19 context, as businesses are increasingly looking for good quality and unique space in order to attract and retain talent.	The proposed mix of residential and non-residential floorspace ensures the Blackwattle Bay precinct maintains the 'less corporate' feel that makes the Pyrmont an attractive location.
Inclusion of Affordable Workspaces The Sydney Startup Hub at 11 York Street is a successful initiative by Investment	This would form part of an IAS, which is not committed to for Blackwattle Bay.
NSW, providing the office floorspace and opportunity for collaboration to support/ nurture the innovation ecosystem. Subject to site considerations, a similar initiative at BWB could consider providing for businesses that require enterprise floorspace, e.g. light industrial, R+D and office space. While there is an opportunity to consider provision of affordable enterprise workspaces at BWB, there is not the policy/ governance framework in place. Issues about appropriate space design, tenant eligibility/ management and governance of the space are among the issues that would need to be addressed.	It is noted that INSW has increased the amount of affordable housing substantially to 7.5% of residential and commercial development.

Attachment 7: Sustainable Buildings SEPP review, Aecom





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ABN 20 093 846 925

30 September 2022

Commercial-in-Confidence

Mia Gouge Infrastructure New South West Level 27, 201 Kent St, Sydney NSW 2000

Subject: Blackwattle Bay ESD Response to SEPP Sustainable Buildings

Dear Mia

INSW requested AECOM provide advice to assist in their preparation of the response of "Attachment 1 – Revised Explanation of Intended Effects" (July 2022) and "Attachment 2 – Revised Draft Design Code" (June 2022) against the requirements of the State Environmental Planning Policy (Sustainable Buildings), last updated on 29 August 2022.

Overview of Reference Documents:

"Attachment 1 – Revised Explanation of Intended Effects" (July 2022)

• Sets out the proposed planning controls for the Blackwattle Bay Precinct

"Attachment 2 - Revised Draft Design Code" (June 2022)

• Provides detailed provisions for the redevelopment of Blackwattle Bay

SEPP Sustainable Buildings 2022:

- A new policy which commences on 1 October 2023 and aims to:1
 - o encourage the design and delivery of sustainable buildings,
 - o ensure consistent assessment of the sustainability of buildings,
 - record accurate data about the sustainability of buildings, to enable improvements to be monitored,
 - o monitor the embodied emissions of materials used in construction of buildings,
 - o minimise the consumption of energy,
 - o reduce greenhouse gas emissions,
 - o minimise the consumption of mains-supplied potable water,
 - o ensure good thermal performance of buildings.
- Summary of major changes²
 - o All buildings to calculate and report on embodied emissions of construction materials
 - For residential developments:
 - Updates to BASIX online tool and interface
 - Introduction of materials index calculator for embodied emissions
 - Increased energy and thermal performance standards (for detached homes and apartment over 5 stories)
 - Water standard unchanged
 - For non-residential developments:
 - Energy standards and associated offsets for large commercial development
 - New water standards for large commercial developments

¹ Chapter 1 Preliminary 1.3 <u>https://legislation.nsw.gov.au/view/whole/html/inforce/current/epi-2022-0521#sec.1.3</u> ² A.3 Features of the policy package, <u>https://www.planning.nsw.gov.au/-/media/Files/DPE/Guidelines/Policy-and-</u>

legislation/Buildings/Sustainable-buildings/Sustainable-Buildings-SEPP-Overview.pdf



 Development minimises the use of on-site fossil fuels, as part of the goal oaf achieving net zero emissions in New South Wales by 2050 (for state significant and large commercial)³

AECOM's advice was required to identify:

- Any overlapping targets or processes
- Any gaps that need to be filled.

Overall, "Attachment 1 – Revised Explanation of Intended Effects" (July 2022) and "Attachment 2 – Revised Draft Design Code" (June 2022)" take a performance-based approach with market-driven targets to achieve sustainable outcomes whilst allowing flexibility to achieve sustainability targets through various measures, and SEPP Sustainable Buildings 2022 establishes an overall framework for minimum building standards consistent with the BCA and introduces new tools, such as embodied emissions of construction materials and update to BASIX tool⁴.

As noted in Chapter 1: 1.5 Relationship with other environmental planning instruments⁵, SEPP Sustainable Buildings 2022 takes precedence over the requirements laid in other planning instruments. However, it is noted that some of the nominated targets within "Attachment 2 – Revised Draft Design Code" (June 2022) strive for more stringent outcome and should be upheld. Appendix A summarises the overlapping targets and gaps identified in "Attachment 1 – Revised Explanation of Intended Effects" (July 2022) and "Attachment 2 – Revised Draft Design Code" (June 2022)".

Any target or criteria not covered by "Attachment 1 – Revised Explanation of Intended Effects" (July 2022) and "Attachment 2 – Revised Draft Design Code" (June 2022)", the requirements of SEPP Sustainable Buildings 2022 should be met.

If you require any further information reading this letter, please do not hesitate to contact me on the details below.

Kind regards

Zoe Kwak

Senior Sustainability Consultant, Buildings + Places M +61 466 297 196 zoe.kwak@aecom.com

https://legislation.nsw.gov.au/view/whole/html/inforce/current/epi-2022-0521#sec.3.3 ⁴ Increase to BASIX Standards commencing on 1st October 2023 <u>https://pp.planningportal.nsw.gov.au/BASIX-standards</u>

³ Chapter 3 Standards for non-residential development 3.3 and 3.4

 ^a Increase to BASIX Standards commencing on 1st October 2023 <u>https://pp.planningportal.nsw.gov.au/BASIX-standards</u>
 ⁵ NSW Legislation <u>https://legislation.nsw.gov.au/view/whole/html/inforce/current/epi-2022-0521#sec.1.5</u>, "if there is an inconsistency between this Policy and another environmental planning instrument, whether made before or after the commencement of this Policy, this Policy prevails to the extent of the inconsistency"

Appendix A	Appendix A					
Category	SEPP (Sustainable Buildings)	Relevant Section in LEP and Design Codes	AECOM Comments			
General		SEPP (Sustainable Buildings) 2022 to be referenced in LEP and Design Codes				
	No specific reference to Green Star target rating for precincts or non-residential developments	 Table 3 Sustainability targets for Precinct, page 33 of "Attachment 2 – Revised Draft Design Code" (June 2022)" 5 star Green Star Communities v1.1 precinct rating 5 star Green Star Buildings v1 rating 	Current targets for office and retail buildings fromTable 3 "Attachment 2 – Revised Draft Design Code" (June 2022			
	No specific target for office and retail base buildings energy use	Office and retail buildings: base building energy use • 45kWh/yr/m2 OR • Certified Green Star Buildings rating with a 'Credit Achievement' in Credit 22: Energy Use OR • Equivalent	Current targets for office and retail buildings fromTable 3 "Attachment 2 – Revised Draft Design Code" (June 2023			
Gaps	No specific target for office and retail buildings renewable energy procurement	Office and retail buildings:renewable energy procurement • Equivalent to 'net zero energy' or a maximum of 45 kWh/yr/m2 of GFA	Current targets for office and retail buildings fromTable 3 "Attachment 2 – Revised Draft Design Code" (June 2022			
	No specific target for hotels whole building energy use	Hotels whole building energy use • 240kwH/yr/m2 or 4 star NABERS Energy CA + 10% OR • Certified Green Star Buildings rating with a 'Credit Achievement' in Credit 22: Energy Use OR • Equivalent	Current targets for office and retail buildings fromTable 3 "Attachment 2 – Revised Draft Design Code" (June 2023			
	No specific target for hotels renewable energy procurement	Hotels renewable energy procurement • Equivalent to 'net zero energy' or a maximum of 240 kWh/yr/m2 of GFA	Current targets for office and retail buildings fromTable 3 "Attachment 2 – Revised Draft Design Code" (June 2023			
	No specific target for precinct renewable energy procurement	Precinct powered by renewable energy • 50%	Current targets for office and retail buildings fromTable 3 "Attachment 2 – Revised Draft Design Code" (June 2022			
	No irrigation target for public open space	Public open space Irrigation 100% recycled water 	Current targets for office and retail buildings fromTable 3 "Attachment 2 – Revised Draft Design Code" (June 2022			
Overlaps	 Schedule 3 Standards for energy and water use for large commercial development section 3.3(2) 1 Energy use (1) The standard for energy use for development for the purposes of prescribed office premises is a 5.5 star NABERS energy rating. (2) The standard for energy use for development for the purposes of prescribed hotel or motel accommodation is a 4 star NABERS energy rating. (3) The standard for energy use for development for the purposes of prescribed serviced apartments is a 4 star NABERS energy rating. (4) To avoid doubt, different standards may apply to the same building if it is used for different purposes. 2 Water use The standard for water use for large commercial development is a 3 star NABERS water rating. 	 Table 3 Sustainability targets for Precinct, page 33 of "Attachment 2 – Revised Draft Design Code" (June 2022)" nominate 6 star NABERS energy rating for office and retail buildings 4 star NABERS energy rating Commitment Agreement + 10% improvmenet for hotels 5 star NABERS water rating for office and retail buildings 	Current targets for office and retail buildings fromTable 3 "Attachment 2 – Revised Draft Design Code" (June 2023			
	 Chapter 3 Standards for non-residential development 3.4 Other considerations for certain State significant development (2) In deciding whether to grant development consent to development to which this section applies, the consent authority must consider whether the development will minimise the use of on-site fossil fuels, as part of the goal of achieving net zero emissions in New South Wales by 2050. 	Net zero carbon precinct • 100% by 2041	Current targets for office and retail buildings fromTable 3 "Attachment 2 – Revised Draft Design Code" (June 2023			
Outstanding	For residential buildings, specific thermal performance targets in line with NCC-BCA have been nominated for each NatHERS Climate Zone	All BASIX energy targets within Table 3 Sustainability targets for Precinct, page 33 of "Attachment 2 – Revised Draft Design Code" (June 2022)" to be reevaluated against the new BASIX standards	With SEPP Sustainable Buildings comes a new version Sustainability Index: BASIX) 2004 is repealed. Pending targets nominated within Table 3 Sustainability targets for Draft Design Code" (June 2022)" must be reviewed in cl noted that Blackwattle Bay Precinct would fall under Nat			

Sustainability targets for Precinct, page 33 of)" to be maintained
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of BASIX tool, and the previous SEPP (Building the extent of upgrade to the BASIX tool, the r Precinct, page 33 of "Attachment 2 – Revised oser detail and may need to be adjusted. It is HERS Climate Zone 56.

Attachment 8: Addendum to Air Quality Assessment, SLR





7 October 2022 610.17553-L02-v2.0-20221007.docx

Infrastructure NSW Level 27, 201 Kent St Sydney NSW 2000

Attention: Geoff Gerring

Dear Geoff

Blackwattle Bay Precinct Addendum Air Quality Assessment Revised Precinct Plan Modelling

In May 2021, an air quality assessment report¹ (hereafter referred to as the AQA) was prepared by SLR Consulting Australia Pty Ltd (SLR) for the proposed rezoning and development of the Blackwattle Bay State Significant Precinct. The AQA found that there is a potential for ambient air quality criteria to be exceeded at proposed residential locations within the site and therefore recommended that a human health risk impact study be completed to quantify the potential risk to human health as a result of the predicted exceedances. A human health risk assessment² ('hereafter referred to as the HHRA') was prepared by SLR, which found that "for both long-term and short-term exposure, the altered exposure circumstances of the proposed development are predicted to provide an average net health benefit" to the community.

In May 2022, and following public exhibition of the State Significant Precinct Study, SLR prepared a response to submissions³ raised in relation to air quality (hereafter referred to as the AQA RtS). This response included a qualitative discussion around the potential changes in air quality impacts associated with the amendments to the public domain and built form at the response to submissions stage, referred to as the Blackwattle Bay (BWB) RtS Precinct Master Plan.

In July 2022, GHD prepared a peer review report (the Peer Review Report) that commented on the technical adequacy and suitability of the AQA and AQA RtS. Issues raised within the Peer Review Report were discussed in a meeting on 4 August 2022 with representatives from the NSW Department of Planning and Environment (DPE), Infrustructure NSW (INSW), GHD and SLR present. Following this meeting and subsequent consultation with the NSW Environment Protection Authority (EPA), DPE requested additional assessment of air quality impacts against the updated National Environment Protection (Ambient Air Quality) Measure air quality standards (2021 Air NEPM Standards) for NO₂. The DPE's request states:

We have had advice from the EPA that the 2021 NEPM standards will likely be enforced with the amended Approved Methods for Modelling adopted in the short term. The EPA recommends current proposals refer to these standards with their adoption imminent.

¹ SLR Report Reference 610.17553-R05-v1.0, dated 20 May 2021

² SLR Report Reference 610.17553-R06-v3.0, dated 21 May 2021

³ SLR Report Reference 610.17553-L01-v1.0, dated 17 May 2022

This advice supports the requirement for assessment and development of air quality controls which consider impacts determined by comparison against the NEPM criteria. Consequently, we are requesting that INSW provide an addendum to the air quality report, which should:

- provide assessment of the existing model outputs against the 2021 NEPM criteria for NO₂
- summarise the percentage of locations (façade receptors), which are earmarked as residential uses, and at which exceedances of the criteria are predicted, and
- summarise the percentage of area allocated as public spaces at which exceedances of the criteria are predicted.

Given that commercial uses will be mechanically ventilated, these are not considered sensitive and no assessment is required at façades earmarked for commercial use.

This report provides responses to DPE request outlined above. This report should be read in conjunction with the AQA and AQA RtS. These documents contain detailed information on the project, the existing environment and assessment methodology.

It is noted that the HHRA is independent of the ambient air quality criteria and the findings of that report remain valid for the scenarios it assesses. The HHRA used concentration response functions to assess the health impacts from long-term exposure and LOAELs from controlled experimental exposure studies for short-term exposure. These aspects are independent of the decision to lower the NO₂ ambient air quality criteria.

Yours sincerely

ALI NAGHIZADEH Principal - Air Quality

Checked/ Authorised by: K Lawrence



1 Air Quality Assessment Methodology and Assumptions

The air quality assessment presented in this report is largely in line with the methodology and assumptions adopted by the AQA with the following changes:

- Assessment against 2021 Air NEPM Standards
- Revised BWB Precinct Plan, inclusive of changes to building forms, proposed uses, receptor locations and traffic volumes
- Updated modelling year
- Updated emissions inventory

Similar to the AQA, the air quality assessment was performed for the following two scenarios:

- Scenario 1 Redevelopment of the entire Study Area
- Scenario 2 Partial Redevelopment of the Study Area with Hymix remaining in place

1.1 2021 Air NEPM NO₂ Standards

On 15 April 2021, The National Environmental Protection Council agreed to vary the Air NEPM, and on 18 May 2021 the ambient air standards for NO₂ and SO₂ were amended. The changes to the standards for NO₂ included:

- The 1-hour standard for NO₂ in the Air NEPM was retained, however the numerical value of the standard was reduced to 80 ppb (164 μ g/m³, previously 120 ppb or 246 μ g/m³).
- The annual standard for NO₂ in the Air NEPM was retained, however the numerical value of the standard was reduced to 15 ppb ($31 \mu g/m^3$, previously 30 ppb or $62 \mu g/m^3$).

The form of both the 1-hour and annual NO₂ standards are as maximum values with no allowable exceedances.

At the time of preparing the AQA, it was not known if, or when, the NSW EPA would formally adopt these changes for the purpose of air quality assessments and therefore the AQA was based on the ambient air quality criteria published in the Approved Methods at the time of preparing the AQA.

NSW EPA updated the *Approved Methods for Modelling and Assessment of Air Pollutants in NSW* (the Approved Methods) in August 2022. The updated document adopts the 2021 Air NEPM standards. In relation to the application of the updated document, the NSW EPA website states:

- We will reference the Approved Methods for Modelling 2022 (NSW EPA, 2022) when evaluating air quality impact assessments submitted as part of any planning application on or after 9 September 2022.
- We will reference the Approved Methods for Modelling 2016 (NSW EPA, 2017) when assessing air quality impact assessments submitted as part of any planning application before 9 September 2022.

The updated air quality assessment presented in this report is based on the 2021 Air NEPM standards.



1.2 Revised BWB Precinct Plan

In response to the submissions received on the exhibited Precinct Plan, an amended public domain and built form framework has been developed for Blackwattle Bay, referred to as the Blackwattle Bay RtS Precinct Master Plan. The amended RtS Precinct Plan was developed with review and input from the Project Review Panel and the Project Working Group, comprising Department of Planning and Environment, Government Architect NSW, Transport for NSW, and City of Sydney members.

Key changes of relevance to the air quality assessment include:

- Proposed building footprints have been moved out of the City of Sydney land parcel adjacent to Bank Street near the intersection with Pyrmont Bridge Road. This locates some of them slightly farther away from the Western Distributor. There is no change to the distance from Pyrmont Bridge Road.
- Removal of Building 07 and reduction from 8 storeys to 6 storeys for Building 2B, Building 06, Building 5A and Building 5B. Building PL01-1 has also reduced in height to RL54.4m from RL65m.
- Further reductions to the Building 5B and Building 03 podiums to improve amenity of adjacent residential.
- Increase in height of Building PL02 tower from RL91.5 to RL100.4m
- Adjusted building footprints for Buildings 05A, 05B and 06, and repositioning and reduction of the tower envelope for Building 02, now Building 2A.
- An increase in tower separations for Private Landowner sites to minimum 24 m above 8 storeys.

There have also been changes in the proposed use on some floors of the buildings as illustrated by the changes in the orange (residential) and grey (commercial) colouring in **Figure 1**.

As a result of the changes in use and built form, the predicted traffic generation rates are also expected to change. The anticipated changes in traffic volumes are presented in the *Blackwattle Bay SSP Study - Updated Transport Assessment* prepared by AECOM and dated 03 June 2022. On average, an 8% reduction in traffic volumes is predicted by AECOM for surrounding roads compared to the Exhibited Precinct Plan.

As outlined in the AQA RtS, while significant changes in model predictions are not likely as a result of the changes to the proposed built form, the increases in setbacks from the Western Distributor and tower separations for Private Landowner sites should result in the predicted concentrations reducing in some areas.

To quantify the potential reductions in pollutant concentrations due to these changes, the traffic volumes, buildings envelopes and receptor locations were updated to reflect the RtS Precinct Master Plan. **Table 1** presents the updated projected morning peak traffic volumes for modelled roads for the year 2033 used in the modelling. **Figure 2** and **Figure 3** illustrate the modelled buildings as well as the location and type of all discrete receptors for the two scenarios modelled. It is noted that the new Sydney Fish Market building, not included in the AQA modelling has also been included in the updated model.



Figure 1 Comparison of Exhibited and RtS Precinct Plans



Table 1 Updated Projected Morning Peak (8am – 9am) Traffic Volumes, 2033

Road Segment	Direction	Heavy Vehicles	Light Vehicles	Total
Bridge Road, between Wentworth Park Road and Wattle Street	eastbound	26	794	820
Bridge Road, between Wentworth Park Road and Wattle Street	westbound	27	927	954
Pyrmont Bridge Road between Wattle Street and Bank Street	eastbound	41	1,138	1,179
Pyrmont Bridge Road between Wattle Street and Bank Street	westbound	26	833	859
Pyrmont Bridge Road between Bank Street and Harris Street	eastbound	48	1,485	1,533
Pyrmont Bridge Road between Bank Street and Harris Street	westbound	28	624	652
Bank Street between Pyrmont Bridge Road and Miller Street	northbound	18	571	589
Bank Street between Pyrmont Bridge Road and Miller Street	southbound	46	424	470
Bank Street between Pyrmont Bridge Road and Miller Street	southbound	46	424	470
Bank Street north of Miller Street	northbound	18	571	589
Bank Street north of Miller Street	southbound	9	220	229
Through site link	northbound	9	231	240
Through site link	southbound	2	44	46
Western Distributer westbound exit ramp to Pyrmont Bridge Road	westbound	18	982	1,000
Western Distributer westbound exit ramp to Pyrmont Bridge Road	westbound	18	982	1,000
Western Distributer westbound exit ramp to Pyrmont Bridge Road	eastbound	29	738	767
Western Distributer westbound exit ramp to Pyrmont Bridge Road	eastbound	29	738	767
Western Distributer westbound exit ramp to Pyrmont Bridge Road	eastbound	29	738	767
Western Distributer westbound exit ramp to Pyrmont Bridge Road	eastbound	29	738	767
Anzac Bridge, btwn Victoria Road and exit to Fish Market Pyrmont Bridge Road	eastbound	243	5,848	6,091
Anzac Bridge, btwn Victoria Road and exit to Fish Market Pyrmont Bridge Road	eastbound	243	5,848	6,091
Anzac Bridge, btwn merge with on ramp from PBR and Victoria Road	westbound	155	3,531	3,686
Anzac Bridge, btwn merge with on ramp from PBR and Victoria Road	westbound	155	3,531	3,686
Anzac Bridge, btwn merge with on ramp from PBR and Victoria Road	westbound	155	3,531	3,686
Anzac Bridge, btwn merge with on ramp from PBR and Victoria Road	westbound	155	3,531	3,686
Western Distributer btwn exit to Pyrmont Bridge Road and exit to Allen Street	eastbound	221	5,214	5,435
Western Distributer btwn exit to Pyrmont Bridge Road and exit to Allen Street	eastbound	221	5,214	5,435
Western Distributer btwn exit to Pyrmont Bridge Road and exit to Allen Street	eastbound	221	5,214	5,435
Western Distributer btwn exit to Allen Street and on ramp from Pyrmont Bridge Road	eastbound	154	4,075	4,230
Western Distributer btwn exit to Pyrmont Bridge Road and merge with on ramp from Pyrmont Bridge Road	westbound	109	2,524	2,632

Figure 2 Modelled Discrete Receptors – Scenario 1



Figure 3 Modelled Discrete Receptors – Scenario 2





1.3 Updated Modelling Year

1.3.1 Selection of the Meteorological Year

A review of the latest five years of meteorological data (2017-2021) from the closest meteorological monitoring station⁴ with detailed hourly data available (Sydney Airport AWS) was performed to determine if the meteorological modelling year used for the AQA (2017) required updating. Specifically, the following parameters were analysed:

- frequency and distribution of the predominant wind directions
- hourly wind speeds observed
- hourly temperature

Based on this analysis, it was concluded that the year 2017, which was used in the AQA is not representative of the last five years of meteorological conditions as it recorded higher than average wind speeds and a lower than average frequency of calm wind conditions.

The analysis concluded that years 2019, 2020 and 2021 were most representative of the last five years of meteorological conditions. The annual average wind speeds compared to the five-year average wind speed were lowest for 2021, which recorded wind speeds that were on average 0.6 metres per second (m/s) lower than the five-year average.

Data collected from 2017 to 2021 is summarised in Figure 4 to Figure 6:

- **Figure 4** shows relatively similar wind roses for all years analysed. There is a slightly higher percentage of south-southeasterly winds and lower frequency of northeasterly winds for 2020 and 2021
- Figure 5 indicates that 2019, 2020 and 2021 exhibit wind speeds that are closest to the long term average; and
- **Figure 6** shows that temperatures are relatively similar for all five years analysed.

Based on the above, the meteorological modelling was updated to compile site representative data for the 2021 calendar year for use in the dispersion modelling.

⁴ The closest BoM AWS (Sydney Observatory Hill AWS), which is located approximately 2 km to the northeast of the Study Area, does not record wind speed and wind direction data.





Figure 4 Frequency of Winds at Sydney Airport AWS for 2017 – 2021









Figure 6 Monthly Average Temperature at Sydney Airport AWS for 2017 – 2021

1.3.2 Background Air Quality for the Selected Modelling Year

Air pollutant data recorded by the Rozelle AQMS were obtained for the calendar years 2017 - 2021. The data are summarised in **Table 2** (red font indicates an exceedance of the relevant criterion). NO₂ data recorded by this AQMS is presented graphically in **Figure 7**.

NO₂ data recorded at Rozelle for the year 2021 (year used for the cumulative assessment) are lower than those of the previous years. While some of this reduction could be attributed to the 2020 and 2021 covid lockdowns in NSW, it is noted that the annual average NO₂ concentration recorded by the Rozelle AQMS in 2017 was the highest annual average concentration since 2012. Assuming such high background NO₂ concentrations for a project that is not expected to be fully developed before 2033 is highly conservative and based on more recent data is considered to not be realistic.

As outlined in the AQA RtS, ambient air quality in Australian cities has generally improved over recent decades, despite increases in vehicle numbers, due to improvements in vehicle engine performance and cleaner fuels. These improvements can be expected to continue as older vehicles in the fleet (including freight and heavy vehicles) are progressively replaced. Further to this, the NSW EPA has a number of initiatives and strategies in place to improve air quality that will continue to drive improvements in air quality in Sydney. Some major relevant initiatives are outlined in the AQA RtS.

It is further noted that while NO₂ concentrations for the new model year of 2021 are relatively low, ozone (O₃) concentrations are higher than 2017 levels. As the OLM method used for the nitrogen oxide (NO) to NO₂ conversion assumes that all the available O₃ in the atmosphere will react with NO in the plume until either all the O₃ or all the NO is used, higher background O₃ concentrations would lead to a higher NO to NO₂ conversion rate.

Table 2Summary of Rozelle AQMS Data (2017 – 2021)

Pollutant	NO ₂		O ₃		
Averaging	Maximum	Annual	Maximum	Annual	
Period	1-hour	Annuar	1-hour	Annual	
Units	µg/m³	μg/m³	μg/m³	µg/m³	
2017	125	22	244	33	
2018	117	14*	167	39*	
2019	185	18	383	38	
2020	88	16	178	40	
2021	72	13	143	37	
Criterion	164	31	-	-	

* The AQMS did not meet 75% data availability, due to recommissioning of the site. The AQMS was offline between 15 February 2018 and 30 May 2018. The data presented is based on available data.





1.3.3 Meteorological Data Used in Modelling

A summary of the annual wind behaviour predicted by GRAMM, extracted at a location within the BWB Precinct⁵ is presented as wind roses in **Figure 8**. The seasonal wind roses indicate that:

- In spring, winds are predominantly from the northeast, with relatively few winds from the north. Calm winds were predicted 2% of the time during spring.
- In summer, winds are predicted to occur predominantly from the northeast and southeast, with the smallest percentage of winds blowing from the northwestern quadrant. Calm winds were predicted 3.2% of the time during summer.
- In autumn, winds are predominantly from the southwest, with the lowest percentage of winds from the north. Calm winds were predicted 3.4% of the time during autumn.
- In winter, winds are predominantly from the western quadrant, with very few winds from the southeastern quadrant. Calm winds were predicted 1.9% of the time during winter.

It is noted that the wind conditions predicted by the model at other areas within the modelling domain may vary from the wind roses presented in **Figure 8**. Further, the GRAL model will further refine the GRAMM predictions to take into account the effect buildings and other solid structures may have on the flow fields. The dispersion of pollutants from each source within the models will reflect the local conditions predicted by GRAMM/GRAL.



⁵ Location coordinates: x= 332,750 m y= 6,250,631 m WGS-84 UTM Zone 56s



Figure 8 Predicted Seasonal Wind Roses for the BWB Precinct (GRAMM predictions, 2021)

1.3.4 GRAMM Model Validation

Figure 9 presents the wind direction and wind speed biases of the CALPUFF and GRAMM model predictions at the location that the above windroses were extracted. **Figure 9** shows insignificant bias is present between CALMET predicted and GRAM predicted wind speed and wind directions at this location. Approximately 80% of winds have no significant direction bias (±7.5 degrees). No significant wind speed bias (± 0.5 m/s) is observed for approximately 60% of the winds and the mean wind speed predicted by GRAMM is only 0.5 m/s lower than the mean wind speed predicted by CALPUFF.

Given the above, it has been concluded that the settings used in the GRAMM model (refer to AQA for detailed settings) are appropriate, and that significant underprediction of wind speed is not likely.





Figure 9 Meteorological Model Bias - CALMET Predictions vs Fort Denison Observations - Met Run 1

1.4 Updated Emissions inventory

As outlined in the AQA, in the absence of detailed vehicle information representative of the NSW fleet in the year 2033, it was assumed that the average vehicle fleet emissions in 2033 are the same as those of 2010. The AQA acknowledges that this assumption is very conservative and presents a sensitivity assessment to quantify the impact of future reductions in vehicle emissions on predicted air pollutant concentrations across the BWB Precinct. The Peer Review Report agrees that "*NOx emissions for the whole road network, are overpredicted*".

The sensitivity assessment methodology used in the AQA has been used in this study to be more representative of future emissions. Incremental vehicle emissions predicted by the COPERT model were scaled using ratios calculated from 2016 and 2031 emissions factors derived from the Roads and Maritime air quality screening model TRAQ. The scaling factors were applied as diurnal variation factors in GRAL.

Table 3 presents the emission factors estimated by TRAQ for the year 2016 and 2031 using the default fleet for NSW arterial roads, with cold start emissions included. Emission factors derived from COPERT have also been included for comparison. The numbers in brackets illustrate the percentage reduction in emissions estimated by TRAQ in 2031 compared to 2016. 2031 TRAQ emission factors were used for scaling as the BWB Precinct is expected to be completed in 2033 and the traffic volumes used in the assessment are projected 2033 volumes.



Table 3TRAQ Emission Factors

Emission Model	Vehicle Fleet Year	Average Vehicle Speed (km/h)	NOx (g/VKT)
TRAQ	2016	10	1.26
		50	0.53
		60	0.54
	2031	10	0.45 (36%)
		50	0.21 (40%)
		60	0.2 (37%)
COPERT	2010	10	1.25
		50	0.99
		60	0.96

1.5 Dispersion Model Configuration

Apart from the changes outlined in the above sections, all other model settings were the same as those detailed in the AQA, including calculation of incremental NO₂ impacts using the OLM methodology.

It was assumed that all vehicles travel at a speed of 10 km/hr (representative of congested traffic conditions) from 6 am to 10 pm every day of the year. For the remaining hours, it was assumed that vehicles travel at 60 km/hr and 50 km/hr on the Western Distributor and all other roads respectively.

The latest version of the GRAL and GRAMM models (GRAL Software Version March 2022 22.03) were used for the modelling. The updated GRAMM modelling resulted in a total of 777 weather situations.



2 Assessment

2.1 Scenario 1 – Redevelopment of the Entire Study Area

The maximum incremental and cumulative 1-hour and annual average NO₂ concentrations predicted at the worst impacted facade receptors for each building, at locations proposed for residential and public outdoor area use are presented in **Table 4**. **Table 5** and **Table 6** present the percentage of residential and public outdoor area receptors exceeding various percentages of the relevant criteria for 1-hour average NO₂ and annual average NO₂ respectively.

Figure 10 illustrates the number of exceedances predicted at the modelled residential and public outdoor area discrete receptor locations for 1-hour average NO₂, while **Figure 11** illustrates locations where exceedances of the annual average criterion were predicted by the model (ie locations). In both figures, the white dots show the receptors where no exceedances of the relevant criterion are predicted. The coloured dots represent locations where the 1-hour average criterion is predicted to be exceeded for at least one hour of the year (**Figure 10**) or where the average NO₂ concentration predicted over the entire year modelled was above the annual average criterion of $31 \,\mu\text{g/m}^3$ (**Figure 11**). As explained in the legend on each figure, the darker the colour of the dot, the more exceedances of the 1-hour criterion were predicted at that location (**Figure 10**), or the higher the annual average concentration was above the annual average criterion(**Figure 11**).

Exceedance of an air quality criterion occurs when the cumulative predicted impact at a given location (ie predicted incremental impact due to modelled sources plus background concentrations) over a specific averaging period (eg 1-hour average, annual average, etc.) is greater than, or equal to, the relevant air quality criterion. If people are present at locations experiencing exceedances of the air quality criteria for the whole duration of the averaging period, certain effects on human health may occur (eg if residential windows at locations predicted to exceed the relevant criteria are open for the whole year where exceedances of annual average criteria are predicted, and people are present at these locations for the entire time). It is noted that quantification of health impacts are beyond the scope of an air quality assessment and are assessed in human health risk assessments. As noted in the covering letter, a human health risk assessment was performed using the results of the previous modelling.

The modelling results presented in the tables and figures show that:

- Exceedances of the 1-hour NO₂ criterion are limited to single receptors along the facades of the PLO1-2 and PLO3-1 buildings only. This equates to 0.4% of receptors modelled for each building.
- Exceedances of the annual NO₂ criterion are predicted at all buildings with the exception of BLD 02B. For the worst impacted building (PL01-1), approximately 4% of receptors are predicted to experience exceedances of the annual average NO₂ criterion
- Across all buildings, only 2 of the 1,967 residential discrete receptors modelled (0.1%) are predicted to
 exceed the 1-hour NO₂ criterion, while 31 of 1,967 residential discrete receptors modelled (1.7%) are
 predicted to exceed the annual average NO₂ criterion. Detailed design will determine if these locations
 can avoid routes of exposure such as openable windows.
- Approximately 0.5% of the public outdoor area receptors are predicted to exceed the 1-hour NO₂ criterion and approximately 16% are predicted to exceed the annual NO₂ criterion.
- Exceedances of the annual average NO₂ criterion for public outdoor area receptors are predominantly expected to occur at locations closest to the Western Distributor.
- As shown in **Figure 11**, exceedances of the annual average NO₂ criterion are also predicted for many of the existing residential receptor locations modelled outside of the Precinct.



Table 4	Predicted NO ₂ Concentrations – Scenario 1	
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Proposed Use	Building	Worst Impacted Receptor (µg/m³)				
		Incremental	Incremental	Cumulative	Cumulative	
		1-n Average	Annual Average	1-n Average	Annual Average	
Residential	BLD 02A	111	22	124	37	
Residential	BLD 02B	129	13	141	27	
Residential	BLD 03	114	19	125	34	
Residential	PL01-1	109	20	126	35	
Residential	PL01-2	214	44	220	58	
Residential	PL02	114	25	134	40	
Residential	PL03-1	154	25	178	39	
Public outdoor areas	-	132	26	167	41	
Criteria		-	-	164	31	

Note 1: Red text indicates exceedance of relevant ambient air quality criterion

Table 5 Predicted Receptors Exceeding Percentage of Criteria – Scenario 1 – 1-hr Maximum

Proposed Use	Building	Total number of receptors modelled	Cumulative 1 hour average maximum NO ₂ predictions Proportion of receptors exceeding % of criterion (164 μ g/m ³)				
			25% 41 μg/m³	50% 82 μg/m³	75% 123 μg/m³	90% 148 μg/m³	100% 164 μg/m³
Residential	BLD 02A	358	94%	32%	0%	0%	0.0%
Residential	BLD 02B	96	83%	49%	5%	0%	0.0%
Residential	BLD 03	529	96%	17%	1%	0%	0.0%
Residential	PL01-1	191	63%	20%	3%	0%	0.0%
Residential	PL01-2	251	66%	11%	2%	0%	0.4%
Residential	PL02	270	56%	10%	2%	0%	0.0%
Residential	PL03-1	272	56%	11%	1%	1%	0.4%
Public outdoor areas	-	406	100%	99%	30%	2%	0.5%

Table 6 Predicted Receptors Exceeding Percentage of Criteria – Scenario 1 – Annual Average

Proposed Use	Building	Total number of receptors modelled	Cumulative annual average NO ₂ predictions Proportion of receptors exceeding % of criterion (31 µg/m ³)				
			25% 8 μg/m³	50% 16 μg/m³	75% 23 μg/m³	90% 28 μg/m³	100% 31 μg/m³
Residential	BLD 02A	358	94%	63%	16%	6%	2.5%
Residential	BLD 02B	96	83%	83%	17%	0%	0.0%
Residential	BLD 03	529	96%	46%	6%	1%	0.4%
Residential	PL01-1	191	63%	43%	13%	8%	4.2%
Residential	PL01-2	251	66%	32%	7%	4%	2.4%
Residential	PLO2	270	56%	30%	4%	1%	0.7%
Residential	PL03-1	272	56%	35%	6%	3%	1.5%
Public outdoor areas	-	406	100%	100%	71%	33%	15.5%



Figure 10 Predicted Exceedances of Cumulative 1-Hour Average NO₂ – Scenario 1


Figure 11 Predicted Concentration of Cumulative Annual Average NO₂ – Scenario 1



2.2 Scenario 2 – Partial Redevelopment of the Study Area

The maximum incremental and cumulative 1-hour and annual average NO₂ concentrations predicted at the worst impacted facade receptors for each building at locations proposed for residential use, and public outdoor areas, for Scenario 2 are presented in **Table 7**. **Table 8** and **Table 9** present the percentage of residential and public outdoor area receptors exceeding various percentages of the relevant criteria for 1-hour average NO₂ and annual average NO₂ respectively.

Figure 12 illustrates the number of exceedances predicted at the modelled residential and public outdoor area discrete receptor locations for 1-hour average NO₂, while **Figure 13** illustrates locations where exceedances of the cumulative annual average criteria were predicted by the model. As per **Figure 10** and **Figure 11**, the white dots show the receptors were no exceedances of the relevant criterion are predicted, while the coloured dotes represent locations where the exceedances are predicted to be exceeded. The darker the colour of the dot, the more exceedances of the 1-hour criterion were predicted at that location (**Figure 12**), or the higher the annual average concentration was above the annual average criterion (**Figure 13**).

Overall, a lower percentage of residential receptors are predicted to exceed the relevant NO_2 criteria compared to Scenario 1. This is attributed to the higher percentage of public outdoor areas present for this scenario. However, as presented in the AQA, a higher percentage of receptors were predicted to experience exceedances of particulate matter criteria for Scenario 2.

The modelling results presented in the below tables and figures show that:

- No exceedances of the 1-hour NO₂ criterion predicted at proposed residential receptors.
- As for Scenario 1, exceedances of the annual NO₂ criterion are predicted at all buildings with the exception of BLD 02B. For the worst impacted building (BLD 02A), only approximately 2% of receptors are predicted to experience exceedances of the annual NO₂ criterion, compared to 4% for Scenario 1.
- Across all buildings, 18 of 1,695 residential discrete receptors modelled (1.1%) are predicted to exceed the annual NO₂ criterion, down from 31 (1.7%) in Scenario 1. Detailed design will determine if these locations can avoid routes of exposure such as openable windows.
- Approximately 0.8% of the public outdoor area receptors (up from 0.5% in Scenario 1) are predicted to exceed the 1-hour NO₂ criterion and approximately 10.9% are predicted to exceed the annual NO₂ criterion. Exceedances of the annual average NO₂ criterion for public outdoor area receptors are predominantly expected to occur at locations closest to the Western Distributor.
- As for Scenario 1, exceedances of the annual average NO₂ criterion are predicted for many of the existing residential receptor locations modelled outside of the Precinct.



Table 7 Predicted NO2 Concentrations – Scenario 2

Proposed Use	Building	Worst Impacted Receptor (µg/m ³)			
		Incremental 1-h Average	Incremental Annual Average	Cumulative 1-h Average	Cumulative Annual Average
Residential	BLD 02A	119	22	131	37
Residential	BLD 02B	137	15	148	29
Residential	BLD 03	111	17	124	31
Residential	PL01-1	110	18	127	33
Residential	PL01-2	109	18	126	32
Residential	PL02	123	19	154	34
Public outdoor areas	-	150	25	172	40
	Criteria	-	-	164	31

Note 1: Red text indicates exceedance of relevant ambient air quality criterion

Table 8 Predicted Receptors Exceeding Percentage of Criteria – Scenario 2 – 1-hr Maximum

Proposed Use	Building	Total number of receptors	umber Cumulative 1 h maximum NO eptors Receptors exceeding % of criteri				2 predictions ion (164 μg/m³)	
	modelled	25% 41 μg/m³	50% 82 μg/m³	75% 123 μg/m³	90% 148 μg/m³	100% 164 μg/m³		
Residential	BLD 02A	358	94%	30%	1%	0%	0.0%	
Residential	BLD 02B	96	83%	50%	6%	1%	0.0%	
Residential	BLD 03	529	96%	17%	0%	0%	0.0%	
Residential	PL01-1	191	63%	25%	2%	0%	0.0%	
Residential	PL01-2	251	66%	13%	1%	0%	0.0%	
Residential	PL02	270	56%	11%	3%	0%	0.0%	
Public outdoor areas	-	376	100%	100%	24%	2%	0.8%	

Table 9 Predicted Receptors Exceeding Percentage of Criteria – Scenario 2 – Annual Average

Proposed Use	Building	Total number of receptors	number Cumulative annual average NO ₂ prediction eceptors Receptors exceeding % of criterion (31 µg				
	modelled	25% 8 μg/m³	50% 16 μg/m³	75% 23 μg/m³	90% 28 μg/m³	100% 31 μg/m³	
Residential	BLD 02A	358	94%	63%	15%	6%	2.2%
Residential	BLD 02B	96	83%	83%	18%	5%	0.0%
Residential	BLD 03	529	96%	45%	7%	1%	0.2%
Residential	PL01-1	191	63%	48%	12%	7%	2.1%
Residential	PL01-2	251	66%	33%	6%	3%	1.6%
Residential	PL02	270	56%	27%	5%	1%	0.4%
Public outdoor areas	-	376	100%	100%	68%	28%	10.9%

Figure 12 Predicted Exceedances of Cumulative 1-Hour Average NO₂ – Scenario 2



Figure 13 Predicted Concentration of Cumulative Annual Average NO₂ – Scenario 2



3 Conclusions

The results of the cumulative impact assessment undertaken to assess the potential worst case air pollutant concentrations within the BWB Precinct due to emissions from local traffic indicate that emissions from these sources have a potential to result in exceedances of the 2021 Air NEPM standards at residential and public outdoor area locations. However, these exceedances are limited to a very small number of proposed residential locations (less than 2%) and public outdoor areas closest to the Western Distributor only.

Table 10 summarises the extent of exceedance of the relevant NO₂ criteria at residential receptor and public outdoor area locations for the two scenarios modelled (as the percentage of receptors modelled). It is noted that openable windows would not necessarily be present at all locations with predicted exceedances.

Modelled Scenario	Percentage o Receptors F	of Residential Exceeding *	Percentage of Public Outdoor Area Receptors Exceeding		
	1-hour	Annual	1-hour	Annual	
Scenario 1 (without Hymix)	0.1%	1.6 %	0.0%	1.1%	
Scenario 2 (with Hymix)	0.5%	15.5%	0.8%	10.9%	

Table 10 Summary of Exceedances Predicted

* average across all buildings

The requirement for any additional air quality mitigation for each building would be further assessed during the next stages of the project. This study has shown that from an air quality perspective, the Study Area is suitable for the intended uses within the SSP proposal, with only a very small percentage of the residential receptors predicted to exceed the reduced NEPM criteria for NO₂ and the magnitude of the exceedances that are predicted being relatively minor.

Where exceedances of criteria are predicted by an air quality impact assessment, a HHRA should be performed to assess the risk associated with the predicted exceedances, as was done in 2021 using the modelling results from the AQA. That study found that "for both long-term and short-term exposure, the altered exposure circumstances of the proposed development are predicted to provide an average net health benefit" to the community. As noted in the covering letter, the HHRA performed using the results of the previous modelling is independent of the ambient air quality criteria (as the decision to reduce the NEPM NO₂ criteria does not rely on any health evidence not available at the time of preparing the HHRA), and is therefore not impacted by the decision to lower the NO₂ ambient air quality criteria. This average net health benefit can be expected to remain with the RtS Precinct Plan changes, however it is recommended for completeness that the HHRA be updated during the next stages of the project.

Attachment 9: Addendum Letters to Blackwattle Bay State Significant Precinct Flooding and Assessment, Stantec, dated 19 October and 9 November 2022 relating to updated flood modelling assessment, flood emergency response and mitigation options.



Cardno

now



Our Ref: 304600768 :VJ Contact: Venus Jofreh

9 November 2022

Infrastructure New South Wales Level 27 201 Kent St Sydney NSW 2060

Attention: Mia Gouge

Dear Mia,

ADDENDUM LETTER TO BLACKWATTLE BAY STATE SIGNIFICANT PRECINCT FLOODING AND ASSESSMENT

In January 2021 Cardno now Stantec undertook the "Water, Riparian Land, Flooding and Stormwater Study" for Blackwattle Bay State Significant Precinct.

Recently Infrastructure NSW (INSW) received comments from the Environment and Heritage Group (EHG) on this report. The comments were reviewed by Cardno now Stantec and the response to each comment were provided. Following this, INSW requested Cardno now Stantec to address the one (1) comments pertaining to the Flood Emergency Response and Evacuation.

This addendum letter provides an update to the Flood Emergency Response and Evacuation for the precinct.

1 Flood Emergency Response

The following comment was provided by EHG on the shelter in place advice in the original Flooding Assessment Report by Cardno:

The SES should be contacted for comment, especially regarding the flood emergency management strategy of 'shelter in place'.

Recently, following the receipt of the comments from EHG on the 1%AEP and PMF flood behaviour, Cardno undertook a review of the flood model, including the model setup and the rainfall input files for both, the 1% AEP and PMF events and it was identified that there is an anomaly in the original rainfall data in the model set-up received from Council. Although the total rainfall depth was correct there was an anomaly in rainfall distribution which was resulting in very high incremental rainfall intensity in the short duration 15min event.

The model was updated and significant decreases in flood levels and extents observed for the 1% AEP 15min rainfall event with the rectification of the anomaly. Therefore, shelter in place is no longer required for the study site. As such **section 9.7.5** of the original report will be updated as below:

9.7.5 Access and Movement and Shelter-in-Place During Flood Events

Any flood response must take into account the availability of flood free access, and the ease with which movement can be accomplished. Movement includes evacuation of people from flood affected areas, medical personnel attempting to provide aid and/or SES personnel installing flood defences.

Bank Street which adjoins the Blackwattle Bay Precinct is relatively flood free except for the intersection with Miller St during both 1% AEP and PMF events. Considering the short duration of flooding for the study site (less than 0.5 hour for 1% AEP event and less



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than 2 hour for PMF event) and availability of flood free access routes, evacuation to closest flood free area / high ground is recommended for the Blackwattle Bay SSP.

Areas to the west of Miller St extension drainage corridor can evacuate to Bank St and Quarry Master Dr or Western Distributor. Areas to the east of Miller St extension drainage corridor can evacuate to Bank St and Pyrmont Bridge Rd or Western Distributor.

Figure 1-1 below shows the possible evacuation routes.



Figure 1-1 Possible Evacuation Routs

Please do not hesitate to contact me if you have any enquiries.

Yours sincerely,

1. John

Venus Jofreh Principal Water Resources Engineer for Cardno Direct Line: 02 9495 8187 Email: venus.jofreh@cardno.com.au

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now



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Our Ref: 304600768 :VJ Contact: Venus Jofreh

19 October 2022

Infrastructure New South Wales Level 27 201 Kent St Sydney NSW 2060

Attention: Mia Gouge

Dear Mia,

ADDENDUM LETTER TO BLACKWATTLE BAY STATE SIGNIFICANT PRECINCT FLOODING AND ASSESSMENT

In January 2021 Cardno now Stantec undertook the "Water, Riparian Land, Flooding and Stormwater Study" for Blackwattle Bay State Significant Precinct.

Recently Infrastructure NSW (INSW) received comments from the Environment and Heritage Group (EHG) on this report (letter dated 23rd August 2022). The comments were reviewed by Cardno now Stantec and the response to each comment were provided. Following this, INSW requested Cardno now Stantec to address the two (2) comments pertaining to the Probable Maximum Flood (PMF) event modelling and results.

This addendum letter addresses these comments, summarises the investigations and updates undertaken to the model, and provides explanation to the issues raised by EHG on the PMF flood behaviour.

1 PMF Results in comparison to 1% Annual Exceedance Probability (AEP) Flood Event

The following comment was provided by EHG on the PMF flood behaviour:

The flood modelling provided is insufficient as it shows areas where flooding is more severe in the 1% Annual Exceedance Probability (AEP) flood than the Probable Maximum Flood (PMF). This means that the flood hazard and other parameters are shown as less in the PMF than for the 1% AEP flood in some areas. Revised modelling is critical to properly understand the flood risk. It is likely that additional (longer) storm durations will need to be modelled for the PMF. This omission raises doubts around the accuracy of the 1% AEP flood modelling, and it is strongly recommended that the 1% AEP flood modelling is reviewed, and additional durations are added to the events modelled. The impact assessment will need to be repeated following these revisions.

Following the receipt of the above comment Cardno undertook a review of the flood model, including the model setup and the rainfall input files for both, the 1% AEP and PMF events.

During the investigations a minor miss-match between the location of one of the inflow polygons between the 1% AEP event and PMF event was identified. This was rectified and the PMF model was updated with corrected inflow polygon location. The model was re-run for both the Existing and Proposed scenarios for the 15 min, 30 min and 1-hour durations.





It was observed that the rectification of the mismatch had a minimal impact on the PMF level, and the 1% AEP flood levels were still significantly higher at some locations in comparison to the PMF event.

2

Further detailed investigations of the model files were undertaken, and it was identified that there is an anomaly in the original rainfall data in the model set-up received from Council. Although the total rainfall depth was correct there was an anomaly in rainfall distribution which was resulting in very high incremental rainfall intensity in the short duration 15min event as shown in **Figure 1-1**. This resulted in overestimation of the flood levels for the 1% AEP 15min event. **Attachment A Figure 22** shows the decreases in flood levels observed for the 1% AEP 15min rainfall event with the rectification of the anomaly.



Figure 1-1 A comparison of 1% AEP and PMF rainfall hyetographs

The rainfall input was corrected, and the model was re-run for the 1% AEP 15 min, 30 min, and 120 min events which resulted in significantly lower flood levels at most locations. A difference plot showing the differences between the peak PMF flood levels and 1% AEP flood levels, presented in **Figure 23** in **Attachment A**, shows the PMF flood levels are now higher than 1% AEP flood levels within the Precinct.

The updated flood behaviour figures for the 1% AEP and PMF events under the Existing and Proposed Scenarios are provided in **Figure 1** to **Figure 12** in **Attachment A**.

2 Updated 1% AEP Flood Impact Assessment

Considering the significant reduction in the 1% AEP flood extent the 1% AEP flood impact were re-assessed. **Figure 13** (**Attachment A**) shows the difference in 1% AEP flood levels between the Existing and Proposed Conditions. Minor localised increases of 0.04m are observed on Bank Street carriageway adjacent to 1 Saunders St. Decreases of up to 0.025 m in flood levels are observed along Pyrmont Bridge Road due to replacing the Existing building with 3 separate building blocks which provides flowpaths between the proposed buildings and allows water to travel between the blocks. Flood level changes along the open channel are related to model instabilities and are not related to the proposed development.

In relation to hazard, there is minimal difference in hazard between the Existing and Proposed Conditions within and outside the study area.



3 Updated Climate Change Assessment

Since the error in the rainfall event was affecting the climate change rainfall data as well, the climate change assessment for increased rainfall intensities was redone and the results are provided in **Figure 14** to **Figure 17** (**Attachment A**). Similar to the 1% event, significant reduction was observed in the 0.5% AEP and 0.2% AEP events.

Cardno now

Stantec

For the 0.5% AEP event, increase in flood levels of less than 0.012 m are observed within the study site and also along Bank Street, Saunders Street and Pyrmont Bridge Road. Increases of up to 0.10 m are observed along the railway line. Extents of flooding will remain the same within and outside the study area will change slightly.

For the 0.2% AEP event, increase in flood levels of less than 0.032 m are observed within the study site and along Bank Street. Increases of up to 0.070 m are observed along Pyrmont Bridge Road. Extents of flooding within and outside the study area will change slightly.

4 **PMF Flood Impact Assessment**

The following comment was provided by EHG on the PMF flood behaviour:

The impact of the proposal on flooding has been assessed in terms of flood levels for the 1% AEP. An assessment is also required for the PMF.

The flood impact assessment for the PMF event was also undertaken and a flood level difference plot for the PMF was also created (**Attachment A - Figure 13b**). The assessment shows that the proposed development will result in up to 0.07 m decrease in the PMF flood levels along Pyrmont Bridge. Localised increases of up to 0.17 mm are observed at Bank St. It is expected that the proposed drainage network modifications in the later stages of the project will improve these impacts. Flood level changes along the open channel are related to model instabilities and are not related to the proposed development.

5 Other Comments

The following additional comments were provided by EHG:

The proposal demonstrates adverse flood impacts and doesn't attempt to provide any mitigation. Rezoning is the appropriate stage to demonstrate a solution is viable. A precinct-wide solution can then inform the requirements of investigations for future development applications. Without a coordinated approach to flooding, there will likely be unmitigated cumulative impacts due to the impact multiple developments being assessed individually. There is also the risk that an underground solution is unfeasible or too costly and the building footprint will need to be reduced to allow overland flow. These issues should be resolved at the rezoning stage.

It should be noted that at this stage no modifications or upgrades to the drainage network are included in the models. It is expected that the minor impacts observed in the 1% AEP event can be resolved at a later stage through inclusion of drainage network modifications and refinement of the civil grading.

Mitigation solutions will be identified before future Development Applications (DA). We recommend that this is undertaken before the first DA for the precinct, however it is noted it would be suitable for this to be after the Bank Street Park DA which will be prepared shortly. This is considered suitable because the mitigation solutions will be focussed on addressing flooding impacts to the south of Bank Street Park.

It should be also noted that the correction in the model set-up has resulted in localised and minimal impacts (lesser impacts in comparison to the previous results).

The precinct will likely be developed over the next 20 years or so. The climate change and sea level assessment has only considered a horizon of 2090/2100, which would only provide a service life of 50/60 years. For sea level rise, a longer timeframe should be considered, for example to 2150. In

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2150, sea level rises of 2 m are in the likely range for Pathway 8.5 and rises of over 5 m have not been ruled out in the latest international reporting (IPCC AR6).

4

The Floodplain Risk Management Guideline Practical Consideration of Climate Change by the NSW Department of Environment and Climate Change (October 2007) recommends sea level rise of 0.4m by 2050 and 0.9 m by 2100. This is what has been adopted by the Blackwattle Bay Flood Study and Floodplain Risk Management Study and Plan which forms the basis for this flood assessment. Adopting a different period can be undertaken, however we believe that then this approach should be standardised 'standard approach' across all the other / similar projects in the area. A different climate change scenario adopted specifically for the Blackwattle Bay Precinct is currently not considered feasible.

Yours sincerely,

2. Johnh

Venus Jofreh Principal Water Resources Engineer for Cardno Direct Line: 02 9495 8187 Email: venus.jofreh@cardno.com.au

Enc: Attachment A - Updated Flood Maps



Attachment A – Updated Flood Maps



WE APE **INSW Infrastructure** New South Wales

Blackwattle Bay Precinct

Existing 1% AEP Flood Depth and Water Level Contour

Legend

Site Boundary			
Existing Buildin	gs		
Contours (0.5n	n)		
Flood Depth (m)			
0.00 to 0.10			
0.10 to 0.30			
0.30 to 0.50			
0.50 to 0.70			
0.70 to 1.00			
1.00 to 1.50			
> 1.50			

FIGURE 1

1:2,500 Scale at A3

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WE APE **INSW Infrastructure** New South Wales

Blackwattle Bay Precinct

Existing 1% AEP Flood Hazard

Legend

- Site Boundary
- Existing Buildings

Flood Hazard

- H1 Generally safe for vehicles, people and buildings.
- H2 Unsafe for small vehicles.
- H3 Unsafe for vehicles.
- children and the elderly.
- H4 Unsafe for vehicles and people.
- H5 Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust buildings subject to failure.

H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure.

FIGURE 3

1:2,500 Scale at A3 60 90 120

150 m





Blackwattle Bay Precinct

Existing PMF Flood Depth and Water Level Contours

Legend

Site Boundary
Existing Buildings
—— Contours (0.5m)
Flood Depth (m)
0.00 to 0.10
0.10 to 0.30
0.30 to 0.50
0.50 to 0.70
0.70 to 1.00
1.00 to 1.50
> 1.50

FIGURE 4

1:2,500 Scale at A3 60 90 120

C Cardno





Blackwattle Bay Precinct

Existing PMF Flood Hazard

Legend

Site Boundary

Existing Buildings

Flood Hazard

H1 - Generally safe for vehicles, people and buildings.

H2 - Unsafe for small vehicles.

H3 - Unsafe for vehicles. children and the elderly.

H4 - Unsafe for vehicles and people.

H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust buildings subject to failure.

subject to failure. H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure.

FIGURE 6

1:2,500 Scale at A3 60 90 120

150 n

C) Cardno



Blackwattle Bay Precinct

Proposed 1% AEP Flood Depth and Water Level Contour

Legend

Site Boundary			
Proposed Buildings			
—— Contours (0.5m)			
Flood Depth (m)			
0.00 to 0.10			
0.10 to 0.30			
0.30 to 0.50			
0.50 to 0.70			
0.70 to 1.00			
1.00 to 1.50			
> 1.50			



1:2,500 Scale at A3 60 90 120

120







Blackwattle Bay Precinct

Proposed 1% AEP Food Hazard

Legend

Site Boundary
Proposed Buildings
Flood Hazard
H1 - Generally safe for vehicles, people and buildings.
H2 - Unsafe for small vehicles.
H3 - Unsafe for vehicles. children and the elderly.
H4 - Unsafe for vehicles and people.
H5 - Unsafe for vehicles and people.
All buildings vulnerable to structural damage. Some less robust buildings subject to failure.
H6 - Unsafe for vehicles and people.
All building types considered

vulnerable to failure.

FIGURE 9

1:2,500 Scale at A3

150 r





Blackwattle Bay Precinct

Proposed PMF Flood Depth and Water Level Contours

Legend

Site Boundary
Proposed Buildings
Contours (0.5m)
Flood Depth (m)
0.00 to 0.10
0.10 to 0.30
0.30 to 0.50
0.50 to 0.70
0.70 to 1.00
1.00 to 1.50
> 1.50

FIGURE 10

1:2,500 Scale at A3 60 90 120 I I I

C Cardno





Blackwattle Bay Precinct

Proposed PMF Flood Hazard

Legend

Site Boundary

Proposed Buildings

Flood Hazard

- H1 Generally safe for vehicles, people and buildings.
- H2 Unsafe for small vehicles.
- H3 Unsafe for vehicles. children and the elderly.

H4 - Unsafe for vehicles and people.

- H5 Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust buildings subject to failure.
- subject to failure. H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure.

FIGURE 12

1:2,500 Scale at A3 60 90 120

C) Cardno



Blackwattle Bay Precinct

Proposed 1% AEP Less Existing 1% AEP Water Level Difference Plot

Legend

_	Site Boundary
	Proposed Buildings
Wet &	Dry Analysis
	Was Wet, Now Dry
	Was Dry, Now Wet
Water	Level Difference (m)
	< -0.50
	-0.50 to -0.20
	-0.20 to -0.10
	-0.10 to -0.05
	-0.05 to -0.01
	-0.01 to 0.01
	0.01 to 0.05
	0.05 to 0.10
	0.10 to 0.20
	0.20 to 0.50
	> 0.50

FIGURE 13

1:2,500 Scale at A3 60 90 120 I I I

C) Cardno



Blackwattle Bay Precinct

Water Level Difference Plot Proposed PMF Less Exisiting PMF

Legend

_	Site Boundary
	Proposed Buildings
Wet &	Dry Analysis
	Was Wet, Now Dry
	Was Dry, Now Wet
Water	Level Difference (m)
	< -0.50
	-0.50 to -0.20
	-0.20 to -0.10
	-0.10 to -0.05
	-0.05 to -0.01
	-0.01 to 0.01
	0.01 to 0.05
	0.05 to 0.10
	0.10 to 0.20
	0.20 to 0.50
	> 0.50

FIGURE 13b

1:2,500	Scal	e at A3
60	90	120
I	I	I

C Cardno

150 n



WE APE **INSW Infrastructure** New South Wales

Blackwattle Bay Precinct

Proposed 0.5% AEP Flood Depth and Water Level Contour

Legend

Site Boundary
Proposed Buildings
—— Contours (0.5m)
Flood Depth (m)
0.00 to 0.10
0.10 to 0.30
0.30 to 0.50
0.50 to 0.70
0.70 to 1.00
1.00 to 1.50
> 1.50

FIGURE 14

1:2,500 Scale at A3 60 90 120 I I I

C) Cardno



Blackwattle Bay Precinct

Proposed 0.5% AEP Less Proposed 1% AEP Water Level Difference Plot

Legend

	Site Boundary
	Proposed Buildings
Wet &	Dry Analysis
	Was Wet, Now Dry
	Was Dry, Now Wet
Water	Level Difference (m)
	< -0.50
	-0.50 to -0.20
	-0.20 to -0.10
	-0.10 to -0.05
	-0.05 to -0.01
	-0.01 to 0.01
	0.01 to 0.05
	0.05 to 0.10
	0.10 to 0.20
	0.20 to 0.50
	> 0.50

FIGURE 15

1:2,500	Scal	e at A3
60	90	120
I	I	I

150 m

C) Cardno



Blackwattle Bay Precinct

Proposed 0.2% AEP Flood Depth and Water Level Contour

Legend

Site Boundary
Proposed Buildings
Flood Depth (m)
0.00 to 0.10
0.10 to 0.30
0.30 to 0.50
0.50 to 0.70
0.70 to 1.00
1.00 to 1.50
> 1.50
Contours (0.5m)

FIGURE 16

1:2,500 Scale at A3 60 90 120 I I I

C Cardno



Blackwattle Bay Precinct

Proposed 0.2% AEP Less Proposed 1% AEP Water Level Difference Plot

Legend

_	Site Boundary	
	Proposed Buildings	
Water	Level Difference (m)	
	< -0.50	
	-0.50 to -0.20	
	-0.20 to -0.10	
	-0.10 to -0.05	
	-0.05 to -0.01	
	-0.01 to 0.01	
	0.01 to 0.05	
	0.05 to 0.10	
	0.10 to 0.20	
	0.20 to 0.50	
	> 0.50	
Wet & Dry Analsis		
	Was Wet, Now Dry	
	Was Dry, Now Wet	

FIGURE 17

	1:2,500	Scal	e at A3
)	60	90	120
	1	1	I

150 n





WE APE **INSW Infrastructure** New South Wales

Blackwattle Bay Precinct

Water Level Difference Plot 1% AEP-15min Less (Revised Less Previous)

Legend

_	Site Boundary	
	Proposed Buildings	
Water Level Difference (m)		
	< -0.50	
	-0.50 to -0.20	
	-0.20 to -0.10	
	-0.10 to -0.05	
_	-0.05 to -0.01	
	-0.01 to 0.01	
	0.01 to 0.05	
	0.05 to 0.10	
	0.10 to 0.20	
	0.20 to 0.50	
	> 0.50	

FIGURE 22

1:2,500 Scale at A3 60 90 120

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WE APE **INSW Infrastructure** New South Wales

Blackwattle Bay Precinct

Water Level Difference Plot Proposed PMF Less Proposed 1% AEP

Legend

_	Site Boundary
	Proposed Buildings
Water	Level Difference (m)
	< -0.50
	-0.50 to -0.20
	-0.20 to -0.10
	-0.10 to -0.05
_	-0.05 to -0.01
	-0.01 to 0.01
	0.01 to 0.05
	0.05 to 0.10
	0.10 to 0.20
	0.20 to 0.50
	> 0.50

FIGURE 23

1:2,500 Scale at A3 60 90 120

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Our Ref: 304600768 :SC Contact: Shefali Chakrabarty

9 November 2022

Infrastructure New South Wales Level 27 201 Kent St Sydney NSW 2060

Attention: Mia Gouge

Dear Mia,

ADDENDUM LETTER TO BLACKWATTLE BAY STATE SIGNIFICANT PRECINCT FLOODING AND ASSESSMENT

In January 2021 Cardno now Stantec undertook the "Water, Riparian Land, Flooding and Stormwater Study" for Blackwattle Bay State Significant Precinct.

Recently Infrastructure NSW (INSW) received comments from the Environment and Heritage Group (EHG) on this report. The comments were reviewed by Cardno now Stantec and the response to each comment were provided. Following this, INSW requested Cardno now Stantec to address the comment pertaining to the impacts observed on the adjoining properties.

Mitigation measures were identified and assessed to address the impacts and this addendum letter provides the outcomes of the assessment.

1 Mitigation of Observed Flood Impacts

The following comment was provided by EHG on the flood impacts observed on Bank Street in the original Flooding Assessment Report by Cardno now Stantec:

The proposal demonstrates adverse flood impacts and doesn't attempt to provide any mitigation. Rezoning is the appropriate stage to demonstrate a solution is viable. A precinct-wide solution can then inform the requirements of investigations for future development applications. Without a coordinated approach to flooding, there will likely be unmitigated cumulative impacts due to the impact multiple developments being assessed individually. There is also the risk that an underground solution is unfeasible or too costly and the building footprint will need to be reduced to allow overland flow. These issues should be resolved at the rezoning stage.

As per previous discussions, the impacts that are observed in the 1% AEP event can be resolved through inclusion of drainage network modifications and/or refinement of the civil grading. Cardno now Stantec have undertaken mitigation options assessment to address this. Upgrade to existing drainage network on Bank St including new additional drainage have been assessed and the results are provided in **Attachment A**.

As it can be observed, the drainage network modifications have resulted in removing the impacts observed in the 1% AEP event.



304600768 :SC 9 November 2022





Please do not hesitate to contact me if you have any enquiries.

Yours sincerely,

Shefali

Shefali Chakrabarty Practice Lead – Urban Water Management for Cardno Direct Line: 02 9024 7001 Email: shefali.chakrabarty@cardno.com.au

Incl: Attachment A – 1% AEP Water Level Difference Map with Mitigation Options

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304600768 :SC 9 November 2022 3



Attachment A – 1% AEP Water Level Difference Map with Mitigation Options



WE APE **INSW Infrastructure** New South Wales

Blackwattle Bay

Precinct Proposed with mitigation Option Less Existing 1% AEP Water Level Difference Plot

Legend

Site Boundary
Proposed Buildings
Existing Drainage
Existing Drainage Upgrade
Proposed Drainage
Wet & Dry Analysis
Was Wet, Now Dry
Was Dry, Now Wet
Water Level Difference (m)
< -0.50
-0.50 to -0.10
-0.10 to -0.05
-0.05 to -0.02
-0.02 to -0.01
-0.01 to 0.01
0.01 to 0.02
0.02 to 0.05
0.05 to 0.10
0.10 to 0.50
> 0.50

FIGURE 25

1:1,000 Scale at A3 10 20 30 40 50 m 1 1 1 1

Map Produced by Cardno NSW/ACT Pty Ltd (NatW&E) Date: 2022-11-9| Project: AWE200202 Coordinate System: MGA Zone 56 Map: BBP_Figures.qgz Aerial Imagery supplied by Nearmap

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Attachment 10: Calculation of Gross Floor Area



fjmturban

INSW_Blackwattle Bay RtS _ GFA Yield — 26/08/22

RtS Massing _ Indicative Yields

The Design Code defines the planning envelope for each building across the precinct plan for Blackwattle Bay. The Design Code represents the Gross Building Envelope. The RtS massing is a refined envelope accommodated within the Design Code controls. This envelope is used for solar testing and represents the Gross Building Area. The 92% efficiency between GBE and GBA is not applicable as the RtS massing is already reduced to GBA, positioned within the envelopes defined by the Design Code.

The RtS Precinct Plan applies the Sydney LEP Definition fo GFA for the calculation of floor space (refer definition on following page).

The following efficiencies have been used to calculate a GFA from the GBA RtS massing;

- Residential 75%
- Commercial 80%
- Ground Floor Retail 50%
- Cultural Space 80%

The residential efficiency is aligned with the City of Sydney's analysis. fjmt undertook a review of 6 complete commercial projects prior to setting the commercial GBA to GFA efficiency and found that 80% represented the average yield achieved across the sample of commercial projects. This percentage is lower than applied in the City of Sydney review.

Ground floor uses are arranged around non-GFA generating plant, driveway access, vertical circulation, storage and setbacks around site specific existing elements. An efficiency of 50% applied to ground level uses allows for the accommodation of such non-GFA elements. This is not taken into account in the City of Sydney review.

The precinct plan assumes a common floor to floor height across commercial and residential uses for the Response to Submission massing. All floors are given a typical floor to floor height to reflect the greater requirements of a commercial use (3.8m). This provided flexibility in testing use mix scenarios in response to feedback across the precinct plan.

Residential buildings can be delivered at residential floor heights (3.2m) within the Design Code envelope controls. This presents the opportunity for increased articulation to residential buildings as the maximum available GFA is distributed over suitable floor to floor heights and provides flexibility for the Apartment Design Guide response for individual buildings.

fjmtstudio	/ architecture /	/ interiors /	urban	/ landscape ,	/ place
------------	------------------	---------------	-------	---------------	---------

Room Name	Zone Number	RtS Building RL	Zone Category	GBA	Efficiency	GFA	Site Area	FSR	Total Non-Res GFA	Apartments	Retail	Commercial	Residential
Private Landowne	ers				12.2						-	1	
	PLO 01 - Poulos	81.4	01 GBA - RETAIL	2757.4	0.5	1378.7		. (é 🗕	8	i	1378.7	1 4 7 7 1	
			02 GBA - COMMERCIAL	7015	0.8	5612.0						5612.0	1 2 1
			03 GBA - RESIDENTIAL	17186.7	0.75	12890.0				151.6			12890.0
	F .			26,959m ²		19,881m ²	5,073m ²	3.9	6,991 m ²				
		100.1		1000 1									$\geq 2^{-1}$
	PLO 02 - Celestino	100.4	01 GBA - RETAIL	1660.4	0.5	830.2				12000	830.2		
P		24 12	02 GBA - COMMERCIAL	4010.8	0.8	3208.6			1		-	3208.6	6140.4
			03 GBA - RESIDENTIAL	12186.8	0.75	9140.1			4000/0	107.5			9140.1
				17,858m²		13,179m ²	2,971m ²	4.4	4,039m ²				
	PLO 03 - Humiy 01	70	01 GBA - RETAIL	0058.0	05	1100 1					1100 1		
		10	02 GBA - COMMERCIAL	3548.4	0.8	28387					1120.1	08387	
			03 GBA - RESIDENTIAL	7529.6	0.75	56472				66.4		2000.1	56472
				13,336m ²	0.70	9 615m ²	3024m ²	32	3 968m ²	00.4			0041.2
	PLO 03 - Hymix 02	54.4	01 GBA - RETAIL	35227	05	1761.4	0,0240	0.2	0,00011		1761.4		
	1 LO CO TIVINA OZ	04,4	02 GBA - COMMERCIAL	21116.4	0.8	16893.1					1101.4	16893 1	
				24,639m ²	0.0	18,654m ²	4,667m ²	4.0	18,654m²			10000.1	
				89 702	m ²	61 220m2	15.725m ²	20	22,650m2	205.6			
Site 2				62,7921	n-	61,329m²	15,755014	5.9	33,002m²	325.0	-		
	Building 01	33	04 GBA - PUBLIC	2052.7	0.5	1026.4	1. 1. 1						
		1.	04 GBA - PUBLIC	7631.5	0.8	6105.2		1111		1		1	
	10			9,684m ²	The second	7,132m ²			7,132m ²				
	Building 2B	29	01 GBA - RETAIL	1002.9	0.5	501.5					501.5		
			03 GBA - RESIDENTIAL	5014.5	0.75	3760.9				46.4			3760.9
h	1 1			6,017m ²		4,262m ²			501 m ²				
	Building 2A	110	01 GBA - RETAIL	366.8	0.5	183.4				1	183,4		
	1		03 GBA - RESIDENTIAL	26964.4	0.75	20223.3				249,7			20223.3
				27,331 m ²		20,407m ²			183m ²				
B-	Building 03	141	01 GBA - RETAIL	2311.3	0.5	1155.7					1155.7		
			03 GBA - RESIDENTIAL	61027.7	0.75	45770.8				565.1			45770.8
				63,339m ²	1	46,926m ²			1,156m ²				
-	Building 04	106	01 GBA - RETAIL	1697.9	0.5	849.0					849.0		
	1		02 GBA - COMMERCIAL	853.2	0.5	426.6	- 11 1					426.6	
	2 ·		02 GBA - COMMERCIAL	45775.1	0.8	36620.1						36620.1	
		<u>, 1</u>	a of Contract to the	48,326m ²	-	37,896m ²			37,896m ²				
	Building 5A	29	01 GBA - RETAIL	1584.7	0.5	792.4	Per			1	792.4		
The second se			02 GBA - COMMERCIAL	7923.5	0.8	6338.8				1.		6338.8	
-	The second second			9,508m ²	1	7,131m ²	110 11 11 11		7,131 m ²				
1	Building 5B	29	01 GBA - RETAIL	1794.5	0.5	897.3					897.3		
	Aller I Aller		02 GBA - COMMERCIAL	7108.4	0.8	5686.7				14 Z	_	5686.7	
				8,903m ²	1 1 1 1	6,584m ²			6,584m ²				
	Building 06	29	01 GBA - RETAIL	1352.1	0.5	676.1					676.1		
	1		02 GBA - COMMERCIAL	6761	0.8	5408.8						5408.8	
1				8,113m ²		6,085m ²			6,085m ²				
											<u> </u>		
				181,222m ²		136,423m ²	41,863m ²	3.3	66,668m ²	861			
Retail GFA						5,055m ²	2						
Commercial GFA						54,481m ²							
Residential GFA						69,755m ²							
Other GFA						7,132m ²							
Total BMD				264,015m ²		197,752m ²	52,931m ²	3.7	100,319m ²	1187	10,154	83,033	97,432
			S I					1.17			5.1%	42.0%	49.3%

	Other
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	3.6%

RtS Massing

Sydney LEP Definition for GFA

gross floor area means the sum of the floor area of each floor of a building measured from the internal face of external walls, or from the internal face of walls separating the building from any other building, measured at a height of 1.4 metres above the floor, and includes—

- (a) the area of a mezzanine, and
- (b) habitable rooms in a basement or an attic, and
- (c) any shop, auditorium, cinema, and the like, in a basement or attic,
- but excludes—
- (d) any area for common vertical circulation, such as lifts and stairs, and
- (e) any basement—
- (i) storage, and
- (ii) vehicular access, loading areas, garbage and services, and
- (f) plant rooms, lift towers and other areas used exclusively for mechanical services or ducting, and
- (g) car parking to meet any requirements of the consent authority (including access to that car parking), and
- (h) any space used for the loading or unloading of goods (including access to it), and
- (i) terraces and balconies with outer walls less than 1.4 metres high, and
- (j) voids above a floor at the level of a storey or storey above.

fjmtstudio/architecture/interiors/ urban /landscape/place







Figure 38 Block PLO1-1 and PLO1-2 Controls

Site Access Tower setback alignment @ CL of PLO 02 Podium setback alignment Min. 3m setback from Western Distributor Min. 3m setback above AHD 21.0 Min. 6m setback above AHD 21.0 Min. 6m setback above AHD 35.6

Pivot Marker

- -- Quarry Master Alignment
- Min. 10m Waterfront Promenade
- 1/1/4 Min. 6m setback from boundary
- /////. Additional promenade setback to Bank St Open Space transition
- Quarry Master Drive continuation void. up to podium height

PLO 1.1 + PLO 1.2

Podium Height (AHD) 21.00m

PLO 1.1

Max. Height (AHD) 54.4m

* Max Height AHD irrespective of Sclar Plane

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Max. GFA (m²) 19,880

PLO 1.2

Max. Height (AHD) 81.4m







Min. 10m Waterfront Promenade

116 Min. 6m setback from boundary

Podium Height (AHD) Max. Height (AHD)

* Max Height AHD irrespective of Solar Plane

Figure 39 Block PLO 2 Controls



Figure 40 Block PLO 3-1 and PLO 3-2 Controls



Site Access Min. 6m setback above AHD 37.5



BLD 2A

Max. Height (AHD)

110m Max. GFA (m²)

20,400

Podium Height (AHD) 37.5 m

*Max Height AHD irrespective of Solar Plane

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Figure 42 Block BLD 03 controls

BLD 03

Max. Height (AHD) 141 m Max. GFA (m²)

47,000

Podium Height (AHD) 37.5m

* Max Height AHD irrespective of Solar Plane





BLD 04 Max. Height (AHD)

106m

Max. GFA (m²) 37,900

Podium Height (AHD) 375m

*Max Height AHD irrespective of Solar Plane



XXXXX Min. 10m Waterfront Promenade

Figure 44 Block BLD 01 controls

BLD 01 Max Height (AHD) 33m

Max. GFA (m²) 7,200

Podium Height (AHD)

*Max Height AHD irrespective of Solar Plane

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* Max Height AHD irrespective of Solar Plane

Figure 45 Block BLD 2B controls



Figure 46 Block BLD 06 controls

BLD 06

-

Max Height (AHD) 375m	
Max. GFA (m ²)	
6,100	
Podium Height (AHD)	

*Max Height AHD irrespective of Solar Plane



Figure 47 Blocks BLD 5A and 5B controls

BLD 5A

Max Height (AHD)

37.5m

Max. GFA (m²)

7,200

Podlum Height (AHD)

* Max Height AHD irrespective of Solar Plane

BLD 5B

-

Max Height (AHD) 375m

Max. GFA (m²)

6,600

Podium Height (AHD)

Attachment 11: Car Parking Correction Memorandum, Infrastructure NSW





Blackwattle Bay Precinct

Memorandum

To: Palitja Woodruff, Department of Planning and Environment

From: Mia Gouge, Infrastructure NSW

Date: 16/11/2022

Re: RTS car parking percent reduction

This memorandum is to state a correction to the Blackwattle Bay Response to Submissions (RTS), prepared by Infrastructure NSW relating to car parking.

The RTS stated there would be a 37% reduction in car parking spaces, which is corrected to a 25% reduction in car parking spaces. This percentage reduction is consistent with the Updated Transport Assessment prepared by Aecom, provided as Attachment 9 to the report.