
Attachment 6 – ESD Response, Aecom

Blackwattle Bay

Response to Submissions

June 2022



14 April 2022

Commercial-in-Confidence

Mia Gouge
Level 27
201 Kent St
Sydney NSW 2000

Dear Mia,

Blackwattle Bay ESD Response to Submissions

INSW requested AECOM provide advice to assist in their preparation of the Response to Submissions Report and update of the Blackwattle Bay State Significant Precinct (SSP) Draft Design Code. The advice was required on the following items:

1. Respond to the ESD concerns in the City of Sydney (the City) Submission (see Table 1)
2. Respond to the Department of Planning and Environment (DPE) Issues Letter including:
 - i. PPPS sustainability initiatives (see Appendix A, Table 2)
 - ii. Investigate provision of a Multi-Utility Hub (see Appendix A, Table 3)
 - iii. ESD report net zero opportunities that have not been addressed (see Appendix A, Table 4)
3. Public submissions (see Appendix A, Table 5)
4. NSW EPA Submission regarding waste and resource recovery

Both the City's submission and DPE's Issues Letter called for implementation of the Pyrmont Peninsula Place Strategy (PPPS), focusing on two main areas:

- a. a desire to see consideration and provision for a Multi-Utility Hub in Blackwattle Bay, and
- b. increased BASIX targets to ensure high-performance new buildings for the precinct.

The PPPS also targets a net zero precinct by 2041. INSW should consider bringing the Blackwattle Bay net zero precinct target forward from 2050 to 2041 to align with the PPPS. With developments in Blackwattle Bay targeting 5 Star Green Star ratings and the associated 'Net Zero Path' applicable from 2023, it is broadly anticipated that the precinct could be well on track to achieve net zero by 2041.

Multi-Utility Hubs

Each component of Multi-Utility Hubs was assessed against the current precinct plan and Draft Design Code (refer to Appendix A, Table 3). It was found that the Blackwattle Bay SSP sets up the precinct to achieve all the outcomes that Multi-Utility Hubs are intended to provide. Many outcomes, including precinct parking, electric vehicle charging, grid-scale battery storage, and recycled water factories, may be located within the (currently) government-owned land, with some components able to be located underneath the Western Distributor, subject to feasibility from utilities constraints.

Other outcomes, such as organic waste systems, community gardens, residential EV charging and end-of-trip facilities, are more appropriately located closer to the users that the systems service (i.e. in buildings or public open spaces). These outcomes are more appropriately achieved dispersed throughout the Blackwattle Bay precinct, as co-location through a Multi-Utility Hub could lead to sub-optimal outcomes such as underutilised organic waste facilities or community gardens without sufficient solar access. Considering the precinct plan is able to achieve the same sustainability outcomes as Multi-Utility Hubs, it is suggested that multi-utility hubs would be better addressed through generic requirements for precinct-scale management of utilities and services. INSW are investigating the feasibility of precinct-scale management of utilities within the BWB SSP Precinct and this being addressed as part of the Response to Submissions Report for the SSP Study.

High Performance New Buildings

To drive sustainability in new buildings for the precinct, it is advised to focus on the Green Star rating scheme, rather than BASIX. The Green Star rating scheme encompasses a comprehensive set of sustainability issues and has a clear path to achieve net zero. It is advised to maintain compulsory BASIX targets at compliance levels, noting that BASIX minimum standards are expected to rise subject to consideration by the DPE and the recent announcement by the NSW Government to update the BASIX standards alongside a range of other initiatives to help deliver more quality across the State. Non-binding 'stretch targets' for BASIX can be included in the Design Code to encourage greater sustainability performance from developers. These can be aligned to the PPPS, SSP Study Requirements and Sydney Water's suggested target. It is reiterated, however, that the main driver for sustainability in new buildings is expected to be the Green Star rating scheme targets.

Further, the Blackwattle Bay SSP sustainability targets for retail and office buildings were compared to those in the City's Draft Development Control Plan (DCP). The Blackwattle Bay SSP targets are more ambitious in every case, apart from setting a specific energy use per GFA. The Blackwattle Bay SSP targets align with the City's goals for net zero buildings (refer to Appendix A, Table 1a).

Sustainability Opportunities

The DPE Issues Letter required clarification on how the Blackwattle Bay SSP Study and Draft Design Code did or did not address opportunities in the PPPS and ESD Report. A gap analysis was undertaken comparing the opportunities identified in the PPPS and ESD Report against the SSP Study and Draft Design Code (refer to Appendix A, Table 4). The assessment found that provisions have been made in the masterplan to accommodate all the sustainability opportunities identified in the PPPS and the Blackwattle Bay ESD Report in the future. Further investigation should be undertaken to realise these opportunities as design and planning for the precinct progresses.

Precinct-scale initiatives, such as microgrids and onsite water recycling systems, would benefit from early investigation and planning, whilst building-specific initiatives should be investigated closer to detailed design. In both instances, the SSP Study and design code provide appropriate provisions for the current masterplan stage in the form of performance targets and space allocation.

Waste and Resource Recovery

The NSW EPA's submission called for further detail on waste, resource recovery and circular economy in the Design Code, and recognition of:

- *NSW Waste and Sustainable Materials Strategy 2041*
- *Better Practice Guide for Resource Recovery in Residential Developments*
- *Better Practice Guide for Public Place Recycling*

INSW should refer to the *NSW Waste and Sustainable Materials Strategy 2041* in the Response to Submissions. It is suggested that the following targets should be added to the Design Code to align with or improve upon this strategy:

- 80% operational waste diverted from landfill (update from previous target of 70% to align with the *NSW Waste and Sustainable Materials Strategy 2041*). Include a 90% stretch target to align with City of Sydney's *Guidelines for Waste Management in New Developments*.
- Phase out problematic and single use plastics by 2025.
- Provide access to food and garden organic waste recycling to every household in the Blackwattle Bay precinct. Note this target is to contribute to NSW's target to halve the amount of organic waste sent to landfill by 2030 across the state.

During the current planning stage, the following actions can be taken to assist in meeting the above targets and drive circular economy outcomes during design:

- Add the following items to the Design Code:
 - i. Design waste management systems for developments in accordance with the NSW EPA *Better practice guide for resource recovery in residential developments* and the City of Sydney's *Guidelines for Waste Management in New Developments*.

- ii. Design waste management systems for public spaces in accordance with the NSW Government *Better Practice Guide for Public Place Recycling*.
 - iii. Manage waste during construction and demolition in accordance with the City of Sydney's *Guidelines for Waste Management in New Developments*.
 - iv. Apply circular economy principles to material selection, waste management plans, and waste system design, including the waste management hierarchy:
 1. Reduce
 2. Re-use
 3. Recycle
 4. Recover
 5. Disposal
 - v. Provision for appropriate space to achieve the waste targets set out in the Design Code. This would entail provisioning for larger recycling volumes, and smaller landfill waste volumes.
- Investigate the feasibility of precinct-scale waste facilities. This could include food organic waste collection and dehydration to reduce organics waste volume. This should be investigated in communication with the City of Sydney's existing food scraps recycling services, future plans for community gardens within Blackwattle Bay, and NSW EPA resource recovery orders and exemptions.

Summary

After reviewing the Blackwattle Bay SSP Study against the DPE Issues and Recommendations, four recommendations emerged in relation to sustainability:

1. Include a concrete commitment in the Blackwattle Bay SSP Study documentation to undertake feasibility studies for:
 - i. A precinct-wide microgrid.
 - ii. A precinct-scale water recycling system.
 - iii. Precinct-scale food organic waste facilities.
2. Add stretch targets with increased BASIX ratings to align with the PPPS.
3. Bring forward the Blackwattle Bay precinct net zero emissions target from 2050 to 2041 to align with the PPPS.
4. Update the Design Code to include the waste and resource recovery targets and line items outlined above.

Overall, the precinct has taken a performance-based approach to drive sustainable outcomes, whilst allowing flexibility to achieve sustainability targets during future design stages. The sustainability targets go above and beyond the City's draft DCP in relation to its targeted NABERS and Green Star ratings (see Table 1a). Further, mandating Green Star 5 Star targets for all building developments goes beyond business as usual practice and sets the precinct up to achieve its net zero ambitions.

For further commentary on the summary provided above, please see Appendix A attached with this letter, containing a detailed response to each of the above items.

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



Kind regards,

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encl: Appendix A

Appendix A



Project Name	Blackwattle Bay State Significant Precinct
Project No.	60554003
Date	13/04/2022
Issued by:	Timothy Lee Fenwick
Reviewed by:	Anna Apollo

1. City of Sydney Submission

Table 1

City of Sydney Submission Excerpt	Section	AECOM Comments
<p>Key Move 4 of the PPPS, low carbon, high performance precinct, aspires to provide multi-utility hubs as precinct infrastructure to reduce the need for on-site parking, which could include the following components:</p> <ul style="list-style-type: none"> – Integrated precinct parking so new residential development does not require on-site parking (decoupled parking) and on-street parking can be removed to create better and cooler streets and reduce parking overall. – A consolidated freight hub component to reduce overall freight movements and enable more efficient last kilometre delivery methods such as cyclists or electric vehicles. – Electric vehicle charging points to avoid clutter on the street. – Grid-scale battery storage to optimise local renewables and electric vehicle charging. – Organic waste systems to manage food waste, creating compost for local gardens and landscaping. – Recycle water factories to create local drought-proof water supply for a cooler, greener precinct. – Social infrastructure such as bike and end of trip facilities to support residents in smaller houses and workers in older, heritage buildings. – Urban farms and community gardens on rooftops. 	Multi Utility Hubs	See '3. Multi-Utility Hubs' tab for a breakdown of how the precinct is achieving the outcomes of a Multi-Utility Hub through a dispersed approach.
<p>It is disappointing that consideration of multi-utility hubs has been completely omitted in the rezoning proposal, despite the conclusion in the accompanying Utility and Infrastructure Serving Report, prepared by Aecom, which makes the following recommendations:</p> <ul style="list-style-type: none"> – Coordination with the Urban Design team to understand development scenarios and limit the impact on the existing trunk utilities – To investigate potential utility amplification to areas of increased density – Further coordination with utility authorities to confirm lead-in infrastructure requirements and routes – Potential hydraulic modelling to confirm potable and wastewater lead-in infrastructure upgrades – Assessment of Ecologically Sustainable Development (ESD) and alternative utility supply options – Assessment of ESD options to confirm the effects on utility supply and lead-in infrastructure requirements and routes, and – Further opportunities for alternative utility supply requiring further investigation as part of this ongoing study. 	Multi Utility Hubs	See '3. Multi-Utility Hubs' tab for a breakdown of how the precinct is achieving the outcomes of a Multi-Utility Hub through a dispersed approach. The recommendations in the Utilities and Infrastructure Serving Report relating to sustainability can be actioned throughout design and development applications.
<p>In accordance with the PPPS, the Key Moves are purposefully ambitious and require ongoing commitment and coordination. The Pyrmont Peninsula Sustainability Framework Scoping Report provides a foundation to deliver multi-utility hubs. The Scoping report also earmarks the Blackwattle Bay area as an area to locate a multi-utility hub to realise the desired spatial distributions of hubs across the Pyrmont Peninsula. In contradistinction, the rezoning proposal makes no consideration of any indicative location of these hubs. The Ecologically Sustainable Development Report (ESD Report), by Aecom merely reproduces the provisions of the PPPS. The Utility Report defers consideration to capacity and servicing requirements to the detailed design stage of the development.</p> <p>However, the precinct planning stage enables for the identification of suitable parcels of land for the ideal location of these hubs. This would maximise the use of unproductive and unvalued land. The proposal presents an opportunity to be deliberate in locating suitable parcels of land to accommodate these hubs. Overall, the proposal does not satisfy the Key Moves and Directions of the PPPS.</p>	Multi Utility Hubs	See '3. Multi-Utility Hubs' tab for a breakdown of how the precinct is achieving the outcomes of a Multi-Utility Hub through a dispersed approach. For most components of the Multi-Utility Hubs, including precinct parking and recycling water systems, an appropriate location could be the area under the Western Distributor as identified in the ESD Report (p33) and in the SSP as an 'Exploration Zone' (p79).
<p>The City considers a stronger commitment to WSUD and water capture and re-use should be pursued in line with the AECOM ESD Report statement, which details "implement strategically prioritised WSUD, such as large-scale raingardens in the public domain". This commitment should be clearly illustrated and secured in the EIE and Design Code.</p>	WSUD	WSUD strategy clearly illustrated in Design Code Section 8.4, page 57 as per the ESD report.
<p>– Passive design for buildings: the City supports the assertion made on enforcing passive design for all buildings from the earliest design stage. For this to take effect, not relying on mechanical heating and cooling must have a prominent place in the Design Excellence requirements for every new building on the site. However, having regard to the proposed residential land uses along the Western Distributor, achieving passive design for these buildings are significantly challenged in obtaining natural ventilation to apartments. The provision of naturally ventilated residential development will also need to ensure that the 24-hour vision for the precinct is not compromised in line with PPPS Blackwattle Bay sub-precinct place priorities.</p>	High Performance New Buildings	<p>Passive design is driven through the performance targets set for Green Star, NABERS and BASIX. Building designers need to consider all aspects of the building concurrently to achieve the performance requirements, so it would not be appropriate at this stage to call out specific initiatives.</p> <p>Natural ventilation should not be called out specifically, as natural ventilation is not inherently beneficial from an ESD perspective. Building designers will need to model the ideal mix of natural vs. mechanical ventilation to consider factors such as air-tightness and urban design considerations such as the 24-hour vision for the precinct mentioned by CoS.</p>
<p>– Building Electrification: the City supports the focus on electrification of buildings and transition to electricity for space and water heating and cooking appliances.</p>	High Performance New Buildings	Noted.
<p>– Renewable energy and solar photovoltaics (PVs): Having regard to the lead times available before any construction commences, the degree of innovation in new developments regarding buildings integrating PVs and the modest PV commitments at the new Sydney Fish Market site, the City anticipates that the Blackwattle Bay SSP will step up to very best practice regarding buildings integrating PVs for each new building. A logical kilowatt capacity target for residential development is 0.25 to 0.3kWp per apartment dwelling. Achieving this performance will be assisted by the continuing improvement in solar cell efficiency that the PV industry has been able to delivery to the market over the past decade.</p>	High Performance New Buildings	<p>Due to the lead times identified by CoS, it would be unwise to lock the precinct into a specific technology or kWp/dwelling due to the fast-paced nature of innovation in the area of PV. The 50% renewable energy target for the precinct is an appropriate driver to allow for the most appropriate/lowest cost option to be chosen at time of development.</p> <p>For buildings registered to undertake a Green Star rating from 1 Jan 2023, 100% of a building's operational energy must be sourced from renewables to achieve 5 stars, which is the minimum goal for building developments in Blackwattle Bay.</p>
<p>– BASIX energy targets for residential development: the current version of the BASIX tool over-rewards gas as a domestic water heating fuel and under-recognises heat pump technology. The City understands that upgrades are being implemented and that BASIX is being absorbed as part of the new Design and Place State Environmental Planning Policy process. The scoring impacts of tool improvements are not yet known. Therefore, it is only possible to indicate appropriate targets above the state mandated minimum BASIX targets for high rise development. An energy target above BASIX 35 would invoke the use of on-site renewable energy solutions. Given that SSP principles include sustainability outcomes including climate change resilience and that on site renewable energy generation is a predicted part of proposal's sustainability outcomes and would contribute to BASIX scores, a BASIX Energy Target clearly above the current mandate for high rise development is appropriate.</p>	High Performance New Buildings	<p>Setting the 5 Star Green Star minimum goal is a more optimal way to drive sustainability performance than through BASIX, since the BASIX tool can be inflexible and currently prioritises gas over electrification (Ref ESD Report p38). From 1 Jan 2023, 5 Star Green Star Buildings will be required to:</p> <ul style="list-style-type: none"> - Generate 20% less embodied emissions than a reference building designed to NCC minimum standards. - Operate 20% more efficiently than a reference building designed to NCC minimum standards. - Source 100% renewable energy for operations. - Eliminate or offset emissions from refrigerants. <p>It is recommended that sustainability performance be driven through the Green Star targets, and that BASIX targets be kept at compliance level.</p> <p>It should be noted that DPIE are currently proposing an increase to BASIX standards in conjunction with updating the BASIX tool. This would see BASIX standards increase to BASIX 63 for mid-rise buildings and BASIX 62 for high-rise buildings in the NatHERS climate zone 56, which includes Blackwattle Bay. The proposal is currently under consideration. Public exhibition closed on 28/2/22.</p>
<p>– BASIX water targets for residential development: BASIX Water targets are only appropriate measure for potable water savings in precinct scale development. Not least because any progressive onsite water harvesting, storage and re-use solutions are likely to be transboundary in nature such as water harvested from apartment roof areas may best be used for non-residential non-potable water supply elsewhere on site for example for toilet flushing in commercial or retail areas, or for cooling tower make up in non-residential spaces. A strong commitment to stormwater and rainwater harvesting storage and re-use is expected within the precinct.</p>	High Performance New Buildings	<p>Setting the 5 Star Green Star goal that includes Water Use 'credit achievement' equal to 40% less potable water use is a more optimal way to drive efficiency in this field.</p> <p>Due to the inflexible nature of the BASIX tool, we advise maintaining the minimum goal of BASIX Water 40 with an investigation to the stretched target of 60 that is comparable (though not equivalent) to an 'exceptional performance' (60% less water use) under the Water Use Green Star credit.</p> <p>Further, previous modelling undertaken by our team suggests they City's stretch target of BASIX Water 50 is achievable for lower (8 storey) buildings, but begins to become challenging for higher (15 and 23 storey) buildings.</p> <p>It is noted that the SSP Study Requirements state that the study must "investigate opportunities to deliver beyond-compliance BASIX scores: Energy 40 and Water 60 for residential buildings (6+ storeys)." Suggest including non-binding 'stretch targets' in the Design Code to encourage greater sustainability performance from developers. These can be aligned to the PPPS, SSP Study Requirements and Sydney Water's suggestion.</p>
<p>– The EIE and draft Design Guide should be updated to require future buildings to achieve the minimum energy and water targets outlined in the PPPS Pyrmont Peninsula Sustainability Framework Scoping Report.</p>	High Performance New Buildings	See above.

<p>– Embodied energy in construction materials: The AECOM report touches lightly on embodied energy. Given dramatic advances in low carbon concrete technology in the past 2 years and the ready availability of concrete that has between 30-50 % less embodied energy in its production and use on construction sites, the City strongly recommends that the NSW government set carbon intensity metrics by specifying a maximum CO2-e intensity per cubic metre of purchased concrete for all bulk concrete works occurring within the precinct including stormwater infrastructure, footpaths, kerb and gutter, foundations and vertical construction slabs throughout the precinct.</p>	<p>High Performance New Buildings</p>	<p>Under the new Green Star Buildings tool, it is a minimum expectation that the building's upfront carbon emissions are at least 10% less than those of a reference building and 20% less for 'credit achievement'. The building's upfront carbon emissions reductions occur through good design and material selection to address this issue. Whilst this would not necessarily guarantee use of low carbon concrete, the rating schemes would act as drivers to incentivise developers and construction contractors towards these products.</p>
<p>Given lead times before any vertical construction commences, the City recommends that the City's Net Zero Buildings Strategy be applied to all new mixed use, office, hotel and residential development within the precinct13. This set of performance standards, which are identified in Appendix B of the AECOM ESD Report, aligns well with the Net Zero precinct ambition already expressed in the SSP documentation and the standards that the City has developed recognise that off-site renewables will be part of the pathway for achieving Net Zero outcomes. The State government is a logical partner in delivering individual building energy and carbon performance to this standard.</p>	<p>Offsetting to deliver a Net Zero Outcome</p>	<p>The table below compares the Blackwattle Bay SSP targets to CoS's Draft DCP Performance Standards for Net Zero Energy Buildings (which is aligned with the City's Planning for net zero energy buildings document). The Blackwattle Bay SSP targets are more ambitious in every case, apart from setting a specific energy use per GFA. The Blackwattle Bay SSP targets align with the City's goals for net zero buildings. The Blackwattle Bay SSP targets for offices and retails buildings are overall ambitious but achievable.</p>

Table 1a

Asset class	Rating type	City of Sydney - Draft DCP		Blackwattle Bay SSP
		2023-2025	2026 onward	
Office	Energy use per GFA (kWh/yr/m ²)	45	45	-
	NABERS Energy CA	5.5 + 25%	5.5 + 25%	6
	Green Star	Certified (4+)	Certified (4+)	5
	Green Star Credit 22: Energy Use	Credit achievement	Credit achievement	Exceptional Performance**
	Renewable energy procurement	-	"Net zero energy" or max 45kWh/yr/m ² of GFA	100% of building's energy*
Retail	Energy use per GFA (kWh/yr/m ²)	55	45	-
	NABERS Energy CA	4	5	6
	Green Star	Certified (4+)	Certified (4+)	5
	Green Star Credit 22: Energy Use	Minimum expectation	Exceptional performance	Exceptional Performance**
	Renewable energy procurement	-	"Net zero energy" or max 45kWh/yr/m ² of GFA	100% of building's energy*

* Only mandatory for building developments that register for a Green Star Buildings Rating after 1 Jan 2023 targeting 5 stars.

** Where buildings achieve 6 star NABERS ratings, they meet the requirements to achieve the 'exceptional performance' level under the GSB Energy Use credit.

2. Pyrmont Peninsula Place Strategy

Table 2

PPPS Excerpt	Subheading	AECOM Comments
<p>Four key sustainability interventions are targeted to deliver precinct-based solutions towards a net-zero carbon precinct by 2041:</p> <ul style="list-style-type: none"> • Multi-utility hubs as precinct infrastructure (refer Big Move 4). 	4 key sustainability interventions	See '3. Multi-Utility Hubs' tab for a breakdown of how the precinct is achieving the outcomes of a Multi-Utility Hub through a dispersed approach.
<ul style="list-style-type: none"> • Green Streets and Active Streets: involving the reallocation of space on key active streets to facilitate increased green open space and canopy to create cooler urban environments (and enabled by multi-utility hubs). 	4 key sustainability interventions	Green Streets and Active streets broadly achieved through Urban Forest Strategy Plan by FJMT and % tree canopy cover targets (SSP, Table 28, page 178).
<ul style="list-style-type: none"> • High Performance New Buildings: to deliver new development that is high performance and resilient by encouraging use of solar, batteries, recycled water, electric vehicles through BASIX and NABERS targets and no on-site parking for residential development. 	4 key sustainability interventions	See responses to CoS comments on increased BASIX targets. 6 star NABERS target for office and retails buildings currently aligned between SSP and PPPS.
<ul style="list-style-type: none"> • Offsetting to deliver a Net Zero Outcome: Modelling suggests that if the other three interventions are delivered there will be a residual quantity of emissions that would require offsetting to reach net zero emissions across the Peninsula. 	4 key sustainability interventions	Offsetting will be required as a matter of course to achieve the net zero precinct target of 100% by 2050 (SSP, Table 28, page 177). Further, developments targeting a 5 Star Green Star Buildings rating will be required to fulfil the rating scheme's 'Net Zero Path'. Note that PPPS targets a net zero precinct by 2041. Consider bringing net zero target forward to 2041.
<p>Place Strategy response:</p> <ul style="list-style-type: none"> • Active transport corridors providing rapid local access to key employment, housing and recreation areas. 	Place strategy response	Active transport provisioned for in SSP (Urban Design Statement Vol 1, page 22).
<ul style="list-style-type: none"> • Harbour edge parkland to support social and ecological resilience (including flood and sea level rise mitigation). 	Place strategy response	Covered in Climate Change Adaptation Report.
<ul style="list-style-type: none"> • Comprehensive street and park tree planting program to achieve 25% canopy cover, reduce “heat island effect” and create a network of walkable comfortable public spaces. 	Place strategy response	Green Streets and Active streets broadly achieved through Urban Forest Strategy Plan by FJMT and % tree canopy cover targets (SSP, Table 28, page 178).
<ul style="list-style-type: none"> • Investigation of “multi-utility hubs” to be created on larger development sites, linked to road and light rail, and providing potential for a range of social and ecological outcomes, including precinct parking, energy and water systems, cultural and community spaces. 	Place strategy response	See '3. Multi-Utility Hubs' tab for a breakdown of how the precinct is achieving the outcomes of a Multi-Utility Hub through a dispersed approach.
<ul style="list-style-type: none"> • New buildings designed to high environmental standards, net-zero water and energy targets and providing for flexibility and future adaptation. 	Place strategy response	See above responses on BASIX and NABERS targets.
<ul style="list-style-type: none"> • Consider the planning principles of the Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 in sub-precinct master planning. 	Place strategy response	Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 has been considered in SSP (SSP, Section B6.8, page 51-54)

3. Multi-Utility Hubs

Table 3

Multi-Utility Hub Outcome	Assessment against SSP
<p>1. Precinct parking so that no new residential redevelopment across the peninsula is required to deliver on-site parking, and on-street parking can be removed to create better and cooler streets.</p>	<ul style="list-style-type: none"> - The Blackwattle Bay SSP is reducing parking spaces in the precinct by proposing reclassification of Land Use and Transportation categories from B to A, and Public Transport Accessibility categories from F to D, reducing parking overall in the precinct. (Ref Blackwattle Bay SSP page 95). This provision, along with the Urban Forest Strategy, achieves the same objectives as integrated precinct parking to: a) create better and cooler streets; and b) reduce parking overall. - The PPPS calls for no on-site parking in new residential development. While SSP and Design Code (Section 6.3, p49) allows for parking in developments, this parking is reduced through reclassification of land use categories and must be basement parking. This is an improvement on the existing environment. - SSP page 144 outlines alternative car parking options such as shared residents/public car parks and car sharing spaces, but these would be developed during detailed design. - The Draft Design Code (Section 6.3, page 49) contains objective to establish requirements for car share schemes. These can be provisioned for during detailed design. - The area under the western distributor provides space for potential public parking to reduce the need for on-street/on-site parking. This area is government owned land (ref SSP, p119), which maintains control to provide the best outcome/utilisation of this space.
<p>2. Electric vehicle charging so that when electric vehicles are available, infrastructure does not clutter the footpath.</p>	<ul style="list-style-type: none"> - A 10% electric vehicle parking minimum goal set for the precinct (SSP page 178 & Design Code Table 8, page 56) - If public parking is provisioned under the Western Distributor, there is ample opportunity to provide electric vehicle charging infrastructure. This, combined with electric vehicle charging infrastructure in the residential developments, can achieve the same outcome as the Multi-Utility Hub in avoiding charging infrastructure from cluttering footpaths. - The Blackwattle Bay SSP Utilities and Infrastructure Servicing Report provisioned for 100 electric vehicle charging points in the demand assessment for the precinct (Ref Section 8.5, p35).
<p>3. Grid-scale battery storage to optimise local renewables and electric vehicle charging.</p>	<p>The area under the western distributor provides opportunity for installation of a grid-scale battery, such as the community batteries currently being trailed by Ausgrid in Cameron Park, Bankstown, and Beacon hill (https://www.ausgrid.com.au/In-your-community/Community-Batteries/Trial-locations). INSW should engage with Ausgrid throughout design and development to implement grid-scale battery opportunities if feasible.</p>
<p>4. Organic waste systems to manage local food waste from residents, creating compost for local garden and landscaping needs.</p>	<p>Organic waste systems are best located close to the waste source, the compost use site, or offsite for commercial-scale processing. The area under the Western Distributor, which presents an opportune location for other components of the Multi-Utility Hub, is not an ideal location for organic waste systems. Organic waste systems would ideally be located:</p> <ul style="list-style-type: none"> - In any future community gardens set up in public open spaces - Within residential/mixed-use developments, close to the source of organic waste - Offsite through City of Sydney's food scraps collection service (https://www.cityofsydney.nsw.gov.au/waste-recycling-services/food-scraps-in-your-building).
<p>5. Recycled water factories to create local drought-proof water supply for a cooler and greener place.</p>	<p>It is understood that INSW have commenced discussions regarding opportunities for water recycling facilities. This would achieve the same outcome as locating a recycled water facility within a Multi-Utility Hub. Precedence for this technology can be found for precinct scale (Sydney Science Park https://www.sydneywatertalk.com.au/sydneysciencepark) and private applications (Central Park https://watersensitivecities.org.au/solutions/case-studies/central-park-2/)</p>
<p>6. Social infrastructure to deliver bike and end-of-trip facilities to support people in small dwellings and businesses in older buildings. Additionally, roof space could be allocated to experimental urban farming and community gardens.</p>	<ul style="list-style-type: none"> - End of trip facilities are more appropriately provisioned for during detailed design in both public spaces and private developments. The current precinct plan provides ample opportunity and space for end-of-trip facilities. - The area under the Western Distributor is an inappropriate location for urban farming or community gardens, due to restricted solar access. Opportunities for community gardens in public open spaces should be investigated with council during DA stage.

Table 3a

	Multi-Utility Hub	Dispersed Approach (Current SSP)
Pros	<ul style="list-style-type: none"> - providing precinct infrastructure upfront de-risks development by providing certainty of services available to future residents. - by eliminating, rather than reducing, on-site parking, Multi-Utility Hubs provide a stronger driver to lower car ownership rates. - a centralised system may aid in integrating various systems (batteries, charging, recycled water plant, etc.) 	<ul style="list-style-type: none"> - able to provide services closest to users / in more appropriate locations. This applies to: <ul style="list-style-type: none"> - parking & EV charging: whilst the SSP masterplan provides a stronger incentive for car ownership than the Multi-Utility Hub concept, having a small number of more conveniently located parking/charging spaces is arguably a better outcome. - local waste solutions: users are more likely to dispose of and utilise organic waste when it is close to the source or application (i.e. residences/restaurants and community gardens) - social infrastructure: the SSP provides flexibility to provide bicycle facilities within residential developments and in the most convenient locations within the public domain. - community gardens and PV: these are able to be placed in areas with optimal solar access.
Cons	<ul style="list-style-type: none"> - limited precedence creates a cost risk - uncertainty regarding who would maintain and operate the Multi-Utility Hub - limits flexibility to provide services in the most convenient/appropriate locations within the precinct. 	<ul style="list-style-type: none"> - more coordination between stakeholders required where systems could benefit from integration - fewer sustainability initiatives are locked in early during master planning, contributing to risk of them being value managed out. However, this risk may be equally as likely with a Multi-Utility Hub.

Conclusion

As outlined above, the Blackwattle Bay SSP sets up the precinct to achieve all the outcomes that Multi-Utility Hubs are intended to provide. Many outcomes, including precinct parking, electric vehicle charging, grid-scale battery storage, and recycled water factories, may be located within the (currently) government-owned land underneath the Western Distributor, subject to feasibility from utilities constraints. Other outcomes, such as organic waste systems, community gardens, residential EV charging and end-of-trip facilities, are more appropriately located closer to the users that the systems service (i.e. in buildings or public open spaces). These outcomes are more appropriately achieved dispersed throughout the Blackwattle Bay precinct, as co-location through a Multi-Utility Hub could lead to sub-optimal outcomes such as underutilised organic waste facilities or community gardens without sufficient solar access. Considering the precinct plan is able to achieve the same sustainability outcomes as Multi-Utility Hubs, it would be preferable to proceed with the more dispersed approach to maintain flexibility in optimal location of the services.

4. ESD Opportunities

Summary
<p>The ESD Report includes a range of opportunities to achieve the sustainability targets for the precinct. The SSP Study, proposed masterplan and draft design code were reviewed against each of the opportunities identified in the ESD report. Overall, it was found that each of the initiatives have been provisioned for to an appropriate level at this masterplanning, rezoning stage. These were generally provisioned for through performance targets in the Design Code and space provisioning in the masterplan. The exception to this general level of fulfilment of the ESD opportunities are the two precinct-scale opportunities: microgrids and recycled water facilities. It is recommended that concrete commitments to undertake feasibility studies for each of these precinct-scale initiatives are included in the Blackwattle Bay SSP documentation, as precinct-scale opportunities are better progressed as early as possible. The remainder of the opportunities are most appropriately implemented during the design stage of each component of the precinct, be that building developments or public spaces.</p>

Table 4	
ESD Report Opportunity	SSP / Masterplan / Design Code: gap or fulfilment
Passive Design	<p>Of the elements of passive design outlined in the ESD Report, building orientation and layout are the two elements that should be considered during precinct planning. The remaining elements (thermal mass, insulation, window placement, etc.) should be considered during detailed design in conjunction with other 'active' elements of the building, such as HVAC systems.</p> <p>The ESD Report (p19) outlines how the proposed Precinct Plan considers passive design: "The proposed Precinct Plan demonstrates consideration of passive design, including a building layout plan that allows for natural airflow across the site and incorporates building height variation. The solar access to the Precinct has also been modelled and the detailed design should ensure northerly orientation of daytime living areas, where feasible, for passive heating. Sufficient north-facing glass can be a challenge to accommodate in narrow precincts. Indicative access to residential towers has also been considered in the Precinct Plan, and detailed design will need to further consider the design of openings to allow for passive cooling, as well as the details for building facades and shading structures."</p> <p>Details on how the precinct plan considers building orientation and layout for solar access can be found in the Urban Design Statement Vol 2 (p75-84).</p>
Energy Efficiency	<p>The SSP and Design Code fulfill the energy efficiency opportunity through the Green Star minimum goals for the precinct. The Green Star Buildings rating requires all buildings to achieve a 10% reduction in operational energy use compared to a reference building built to NCC standards. For buildings registered to undertake a Green Star rating from 1 Jan 2023, 5 Star buildings must achieve a 20% reduction in operational energy use as part of Green Star's 'Net Zero Path'. As the Design Code has set a 5 Star Green Star minimum goal, this is expected to apply to the building developments at Blackwattle Bay.</p> <p>Building-specific energy efficiency measures should be identified during detailed design.</p>
Building Electrification	<p>The SSP and Design Code fulfill the building electrification opportunity through the Green Star minimum goals for the precinct. For buildings registered to undertake a Green Star rating from 1 Jan 2023, 100% of a building's energy must be sourced from renewables to achieve 5 stars. This requires buildings to 100% electrified, apart from small amounts of fossil fuels with offsets for cooking or emergency purposes.</p>
On-site renewable energy - Solar Photovoltaics (PV)	<p>The SSP and Design Code have set a 50% renewable energy target. Whilst this target can be met with on or off-site renewable energy, on-site renewable energy is likely to provide the most economical form of renewable energy, with a potential supplement of off-site renewable energy.</p>

Microgrids (Embedded Network)	<p>Early consideration of microgrids generally involve the following steps:</p> <ol style="list-style-type: none"> 1. Feasibility study / concept design covering: <ol style="list-style-type: none"> a. Options for embedded network arrangement (e.g. precinct-wide, networks for individual buildings, etc.) and ownership b. Opportunities for onsite renewable energy generation and storage and high-level sizing c. Demand analysis d. High-level cost-benefit analysis (e.g. favourable electricity consumption and feed-in tariffs for tenants, increased reliability for essential electricity loads such as lifts or street lights, increased self-consumption of renewable energy). 2. Identification of additional utility infrastructure requirements, including transformers, electricity connections, and a dedicated communications network. <p>The SSP has tangentially undertaken the above steps by:</p> <ul style="list-style-type: none"> - identifying the rooftop PV resource available in the precincts (Ref ESD Report, p22-23) - provisioning space for potential central services (Ref ESD Report, p33) <p>It is recommended that INSW continue investigation of the feasibility of microgrids for the precinct. This investigation does not require updating the masterplan or Design Code. It is noted, however, that the earlier investigation is undertaken, the more opportunity there is to take advantage of any potential favourable outcomes of the microgrid.</p>
Power Purchase Agreements (PPAs)	The SSP and Design Code have set a 50% renewable energy target. PPAs are typically arranged during detailed design or operation. No further action is required at the SSP study stage.
Green Infrastructure	The Urban Forest Strategy and green roof plan (Ref ESD Report p26) demonstrate fulfilment of the green infrastructure opportunity.
Cool Materials	As noted in the ESD Report (p27), cool materials are typically identified at detailed design stage. The way the SSP notes cool materials as an opportunity for investigation is appropriate.
EV Charging Infrastructure	The SSP and Design Code fulfil the EV charging infrastructure opportunity through the minimum goal to provide 10% of all car parking spaces with EV charging.
Active Transport	<p>The Blackwattle Bay masterplan includes both the continuous promenade and dedicated cycle way to connect Blackwattle Bay with the active transport network of the Pyrmont Peninsula (Ref Urban Design Statement Vol 1, p17; Urban Design Statement Vol 2, p14). Provisions for bicycle parking are most appropriately addressed during detailed design.</p> <p>As recommended by the ESD Report, the amount of car parking available in public areas would be reduced through rezoning in the precinct.</p>
Water Efficiency Measures and Fixtures	The SSP and Design Code fulfil the water efficiency opportunity through the minimum goal to achieve 5 Star Green Star Buildings ratings. Water efficiency is addressed through the installation of water-efficient fixtures and systems to achieve min. 10% and 20% water use reduction (as a part of the minimum expectation and credit achievement, respectively) for the Green Star rating.
Water Sensitive Urban Design	A Water Sensitive Urban Design Strategy has been developed for the precinct, and measures included in the Design Code (p57) to ensure implementation.
Rainwater Harvesting	The Water Sensitive Urban Design Strategy includes areas for roof water/stormwater harvesting (Ref Design Code, p57)
Onsite Water Recycling Systems	<p>The SSP and Design Code have set a minimum goal of 100% of public open space to be irrigated with recycled water. It is appropriate at this stage to set a performance target, rather than prescribing specific technologies, to allow the optimal solutions to be chosen. The ESD Report notes potential barriers to feasibility and sustainability benefits.</p> <p>It is understood that INSW have commenced discussions regarding opportunities for precinct-scale water recycling facilities.</p>
Construction and Demolition Waste Reduction	The SSP and Design Code set a minimum goal of 80% of construction and demolition waste diverted from landfill. It is appropriate to set a performance-based target during this stage. Construction contractors would typically develop a waste management plan during construction and demolition to achieve this target.
Operational Waste Minimisation and Improved Recycling	The SSP and Design Code set a minimum goal of 70% of operational waste diverted from landfill. It is appropriate to set a performance-based target during this stage. Building/precinct-specific measures are better left for detailed design to achieve this target.

5. Public Submission

Table 5

Submission Excerpt	AECOM Comments
<p>The claim that demand for gas will not change till 20 or 30 years is not supported by the evidence.</p> <p>Aecom page 21 makes this claim:</p> <p>“At present, mains natural gas has lower carbon intensity than NSW grid electricity for thermal end-use purposes. However, this is expected to change over the next 20 to 30 years as large-scale renewables continue to come online in the electricity network and drive grid decarbonisation and as more unconventional sources of gas are explored.”</p> <p>It would appear that Aecom has failed to identify the urgency to address carbon emissions. Including gas infrastructure as part of a major new building project in 2021 for a 40 year life (beyond 2050) would be totally irresponsible and negligent.</p>	<ol style="list-style-type: none"> 1. It is noted that the statement made in the ESD Report is a comment on the carbon intensity of natural gas, rather than demand for natural gas. 2. The energy industry is rapidly changing. At the time of writing, the estimated timing of reduction in carbon intensity of electricity was based on interpolation of the NSW climate change commitment to net zero by 2050. Since the time of writing, the Australian Energy Market Operator has published forecasts for renewable energy penetration. Based on these forecasts, and assuming a linear relationship between renewable energy penetration and grid carbon intensity (based on 2021 figures), the electricity grid can be expected to become less carbon intensive than gas in 5-23 years, with AEMO's 'most likely' scenario predicting 2030, in 8 years. 3. The ESD Report does not advocate for the inclusion of gas infrastructure in new developments. The ESD Report supports electrification in anticipation of future reductions in carbon intensity of the electricity grid. 4. The industry generally is expected to shift away from fossil fuels, including gas, with installation either limited or excluded entirely. This issue will need to be addressed on a project by project basis. The ESD Report and Design Code mandate 5 star GreenStar targets for new buildings. From January 2023, this will necessitate complying with GreenStar's 'Climate Positive Pathway', which does not allow for the use of any fossil fuel energy sources for operation.
<p>Aecom makes the following claim on Page 28</p> <p>“By 2040, EVs are projected to account for 70 to 100 per cent of new vehicle sales and at least 30 per cent of the vehicle fleet in Australia.” CSIRO has updated this projection to 70% of new cars being EVs by 2030 and 100% EV by 2040. Aecom projections are out of date. It is respectfully suggested that Aecom's claims be rejected as being inconsistent with the best available predictions.</p> <p>The proposed development must incorporate EVs as an integral feature including vehicle 2 grid energy supply. During the development phase of this project, it is also likely that wall mounted photo electric devices will become a standard feature of sustainable development.</p>	<p>CSIRO's update of EV uptake projections occurred after the time of writing. CSIRO's May 2021 projections include a range of scenarios ranging from <10% to >85% in 2030, and <30% to 100% in 2040. Whichever projections are used, it is broadly acknowledged that EV sales are expected to increase, and the ESD Report recommends the installation of EV charging infrastructure. This is taken on by the SSP, which sets a target of 10% electric vehicle parking.</p> <p>Though more established overseas, vehicle to grid (V2G) charging is a relatively emerging technology in Australia, with products beginning to be available in late 2020 (https://thedriven.io/2020/10/27/first-vehicle-to-grid-electric-car-charger-goes-on-sale-in-australia/). The technology has most financial incentive for vehicle owners in a residential setting, where household electricity use is provided by battery during peak electricity prices. It is suggested that future stages of design consider V2G charging, but it would not be appropriate to mandate it at this stage of design. Efforts should be made to ensure the most up-to-date technologies are incorporated into designs.</p> <p>Photoelectric devices relate to a building management system - which is too detailed for a high-level precinct plan. Developers may consider such technologies when aiming to achieve building performance targets.</p>
<p>Aecom makes many references to energy demand arising from building design and operation. The current building standards are quite lax and it is relatively easy to obtain top ranking. International best practice is of a much higher standard than the current crop of Australian criteria. Air leakage testing should be mandatory. Climate change and increasing temperatures will impose an even greater challenge on the energy efficiency criteria. The imposition of natural ventilation needs to confront the increase in air temperatures that will occur under a changing climate.</p>	<p>Mandating high Green Star, NABERS and BASIX targets will drive the development of buildings beyond Australia's minimum standards. Air leakage testing would typically be considered by building designers as part of a range of other measures to meet the building performance targets.</p>