

Pitt Street North Over Station Development

K. Ecologically Sustainable Development Report and Sustainability Strategy

**State Significant Development, Development
Application (SSD DA)**

Prepared for: Pitt Street Developer North Pty Ltd

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Executive Summary

The Pitt Street North Over Station Development (OSD) is a proposed tower comprised of commercial and retail space to be constructed above the Pitt Street Metro Station. Ecologically Sustainable Design (ESD) principles are being applied in the design, delivery and operation of the project, and third-party verification will be provided through Green Star Design & As-Built v1.3 certification.

The following commitments have been made for the development:

- Achieve a 6 Star Green Star rating using Green Star Design & As-Built (v1.3) rating tool

The following commitments have been made for the office space only:

- 5 Star NABERS for Offices Base Building Energy rating
- 3.5 Star NABERS for Offices Whole Building Water rating

The project will develop the following initiatives during the detailed design phase:

- Efficient building services, systems, equipment and controls incorporating sub-metering for improved tracking of operational performance.
- Passive design principles to improve thermal comfort and reduce air-conditioning energy through a high-performance facade with energy-efficient glazing, insulation and fixed shading.
- Regenerative lifts with best-in-class energy efficiency performance.
- Rainwater capture and reuse for toilet flushing and landscape irrigation.
- Close proximity to public transport and amenities.
- More sustainable timber and concrete specification.
- Low-volatile organic compounds (VOC) paints, carpets, sealants and adhesives and low formaldehyde engineered wood products.
- Diversion of construction waste from landfill and on-site operational waste management facilities.
- A climate risk and adaptation assessment to identify practical actions to be taken to manage risks from climate impacts and make the building more resilient.

Sustainability initiatives proposed are described in greater detail in Section 3 of this report.

1.0 SEARS, Conditions of Consent & Updated items

1.1 SEARS

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARS) Dated 25 October 2019. Specifically, this report has been prepared to respond to the SEARS requirements summarised in Table 1

Table 1: SEARS requirements

Item	Description of Requirement	Section Reference (this report)
7 - Ecologically Sustainable Development (ESD)	a) Detail how ESD principles (as defined in clause 7(4) of Schedule 2 of the EP&A Regulation 2000) will be incorporated in the design, construction and operation of the development.	Section 4.1 (p.13-14)
7 - Ecologically Sustainable Development (ESD)	b) Include a framework for how the proposed development will reflect national best practice sustainable building principles to improve environmental performance, including energy and water efficient design and technology, use of renewable energy and best practice in waste management strategy including any opportunity for food scraps/composting strategies. c) Demonstrate sufficient waste and recycling management facilities storage and holding areas for servicing. d) Sustainability Strategy for the development should be prepared in line with concept approval.	Section 4.2 (p.14-17)
Plans and Documents – ESD Statement (incorporating a sustainability framework)	Demonstrate any sun shading devices required to mitigate against solar gain.	Section 4.2 (p.14-17)

1.2 Conditions of Consent

This report has also been prepared in response to the following Condition of Consent for the State Significant Development Concept (SSD 8875) for the OSD summarised in Table 2

Table 2: Concept Approval of Conditions of Consent

Item	Description of requirement	Section reference (this report)
B9 - Environmental Performance / ESD	Demonstrate how the principles of ecologically sustainable development (ESD) have been incorporated into the design, construction and ongoing operation of the proposal. The ESD credentials shall be in accordance with the framework, targets and visions of the ESD Report lodged with the EIS prepared by Sydney Metro (August 2018).	Section 1 (p.4) and 4.2 (p.17-18)

B10 - Environmental Performance/ ESD	<p>Proposed minimum performance targets for environmental performance are:</p> <p>for a commercial / office use:</p> <p>5 Star NABERS for Offices Base Building Energy rating; and,</p> <p>3.5 Star NABERS for Offices Whole Building Water rating.</p> <p>Green Star ratings:</p> <p>(ii) for office / commercial use, 6 Star Green Star</p>	Section 4.5 (p.23) and 4.6 (p.25)
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1.3 Updates Since Previous Submission

This section of the report describes the changes that have been made to this report since Round 1 Submission to Sydney Metro, due to the following reasons:

Type of Change	Description of Change	Section Reference
Updated information	Update to Figure 2 – Sydney Metro Alignment Map to latest map.	Section 2.2.2 – Page 7
Updated information	Update to Sydney metro description	Section 2.2.2 – Page 6
Information removal	Removal of concept approval	Section 2.2.2- Page 9
Information inclusion	Addition of ESD principals in line with SEARs requirements	Section 4.1 – Page 13 & 14
Information inclusion	Addition of sustainability framework information in line with SEARs requirements	Section 4.2 – Page 14 & 15

2.0 Introduction

2.1 General

This report has been prepared to accompany a detailed State Significant Development (SSD) development application (DA) for a commercial mixed-use Over Station Development (OSD) above the new Sydney Metro Pitt Street North Station. The detailed SSD DA is consistent with the Concept Approval (SSD 17_8875) granted for the maximum building envelope on the site, as proposed to be modified.

The Minister for Planning, or their delegate, is the consent authority for the SSD DA and this application is lodged with the NSW Department of Planning, Industry and Environment (NSW DPIE) for assessment.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 25 October 2019.

The detailed SSD DA seeks development consent for:

- Construction of new commercial tower of approximately 38 storeys
- The tower includes maximum GFA, excluding floor space approved in the CSSI.
- Integration with the approved CSSI proposal including though not limited to:
 - Structures, mechanical and electronic systems, and services; and
 - Vertical transfers.
- Use of spaces within the CSSI 'metro box' building envelope for the purposes of:
 - Retail tenancies;
 - Commercial lobby and commercial amenities;
 - Car parking spaces within the podium for the purposes of the commercial premises; and
 - Loading and services access.
- Utilities and services provision.
- Stratum subdivision (staged).

2.2 The Project

2.2.1 Site

The site is located within the Sydney CBD. It has three separate street frontages, Pitt Street to the west, Park Street to the south and Castlereagh Street to the east. The area surrounding the site consists of predominantly commercial high-density buildings and some residential buildings, with finer grain and heritage buildings dispersed throughout.

The site has an approximate area of 3,150.1sqm and is legally described as 252 Pitt Street (Lot 20 in DP1255509).

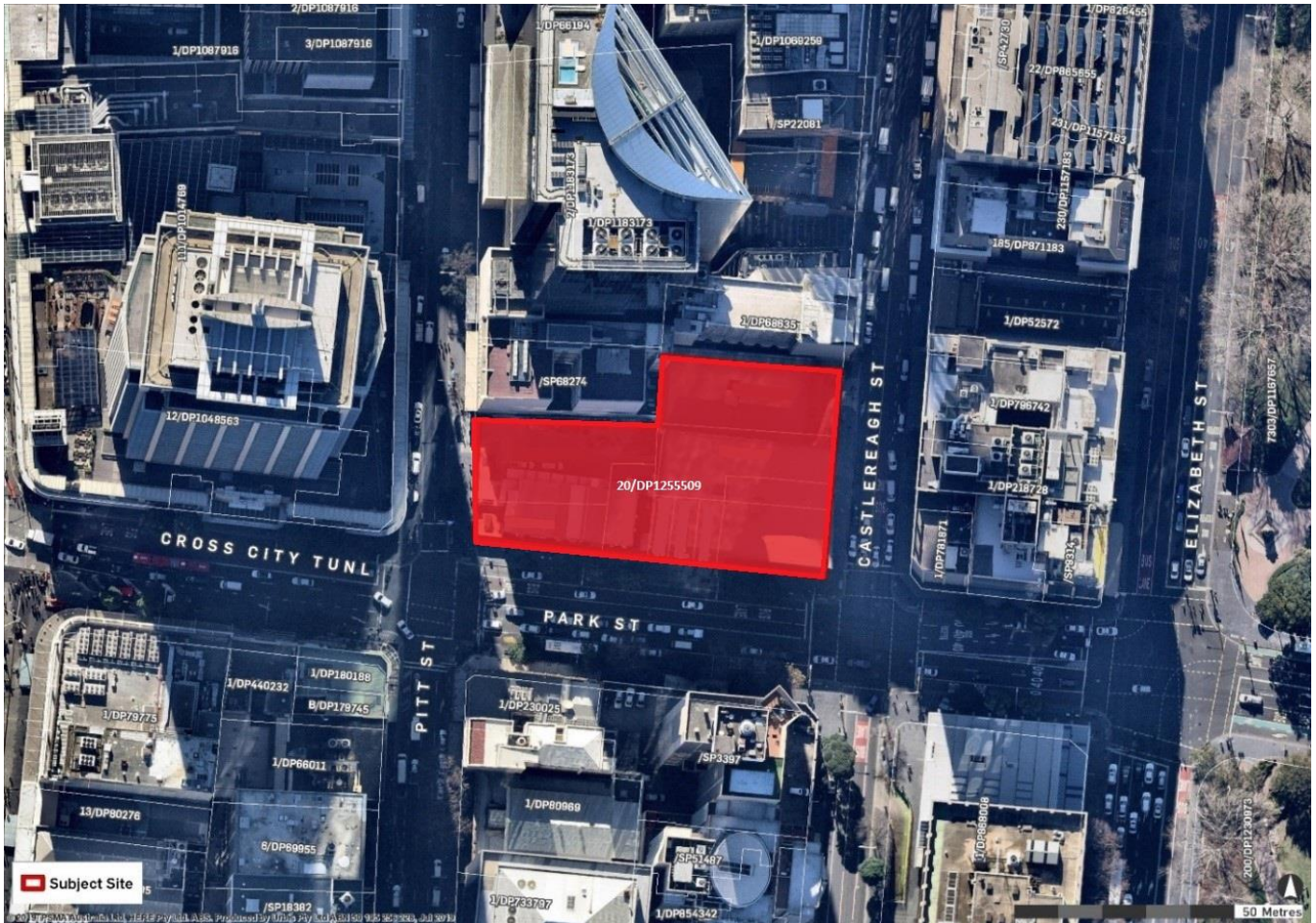


Figure 1: Location Plan (Source: Urbis)

2.2.2 Sydney Metro Description

Sydney Metro is Australia's biggest public transport program. A new standalone railway, this 21st century network will revolutionise the way Sydney travels.

There are four core components:

1. Sydney Metro Northwest (formerly the 36km North West Rail Link)

This project is now complete and passenger services commenced in May 2019 between Rouse Hill and Chatswood, with a metro train every four minutes in the peak. The project was delivered on time and \$1 billion under budget.

2. Sydney Metro City & Southwest

Sydney Metro City & Southwest project includes a new 30km metro line extending metro rail from the end of Metro Northwest at Chatswood, under Sydney Harbour, through new CBD stations and southwest to Bankstown. It is due to open in 2024 with the ultimate capacity to run a metro train every two minutes each way through the centre of Sydney.

Sydney Metro City & Southwest will deliver new metro stations at Crows Nest, Victoria Cross, Barangaroo, Martin Place, Pitt Street, Waterloo and new underground metro platforms at Central Station. In addition it will upgrade and convert all 11 stations between Sydenham and Bankstown to metro standards.

In 2024, customers will benefit from a new fully-air conditioned Sydney Metro train every four minutes in the peak in each direction with lifts, level platforms and platform screen doors for safety, accessibility and increased security.

1. Sydney Metro West

Sydney Metro West is a new underground railway connecting Greater Parramatta and the Sydney CBD. This once-in-a-century infrastructure investment will transform Sydney for generations to come, doubling rail capacity between these two areas, linking new communities to rail services and supporting employment growth and housing supply between the two CBDs.

The locations of seven proposed metro stations have been confirmed at Westmead, Parramatta, Sydney Olympic Park, North Strathfield, Burwood North, Five Dock and The Bays.

The NSW Government is assessing an optional station at Pyrmont and further planning is underway to determine the location of a new metro station in the Sydney CBD.

2. Sydney Metro – Western Sydney Airport

Metro rail will also service Greater Western Sydney and the new Western Sydney International (Nancy Bird Walton) Airport. The new railway line will become the transport spine for the Western Parkland City's growth for generations to come, connecting communities and travellers with the rest of Sydney's public transport system with a fast, safe and easy metro service. The Australian and NSW governments are equal partners in the delivery of this new railway.

The Sydney Metro Project is illustrated in the figure below.

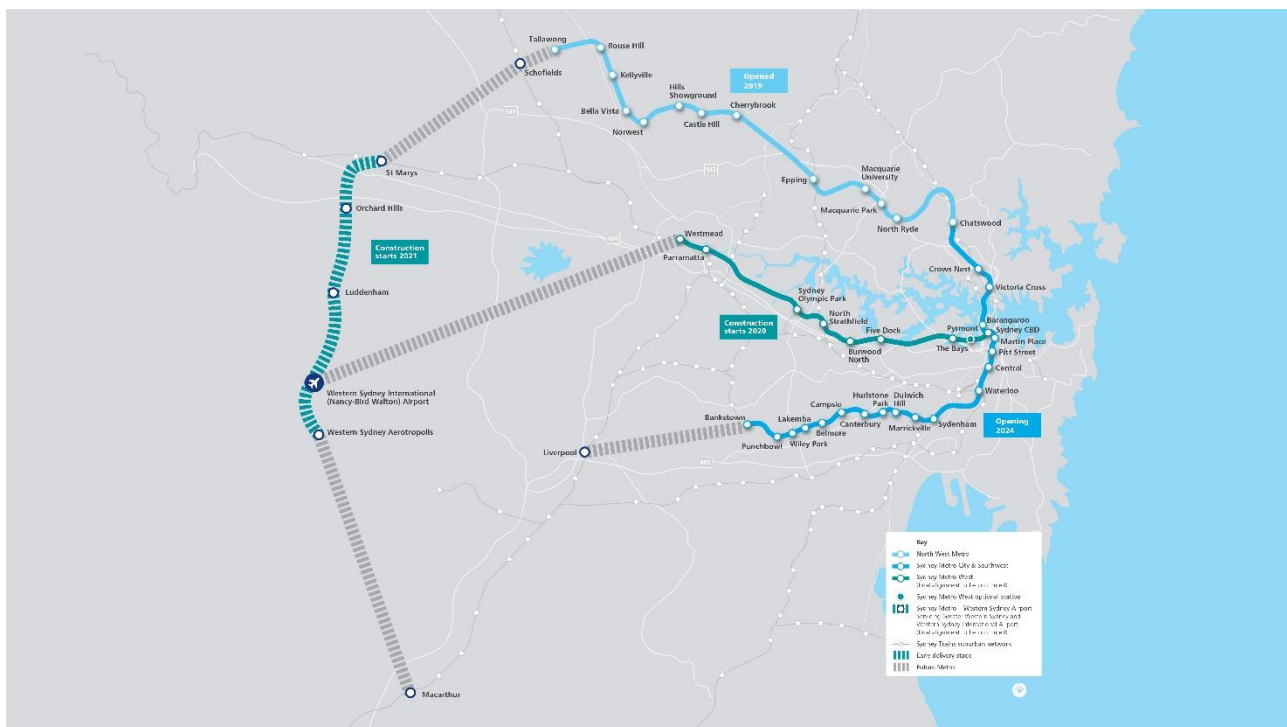
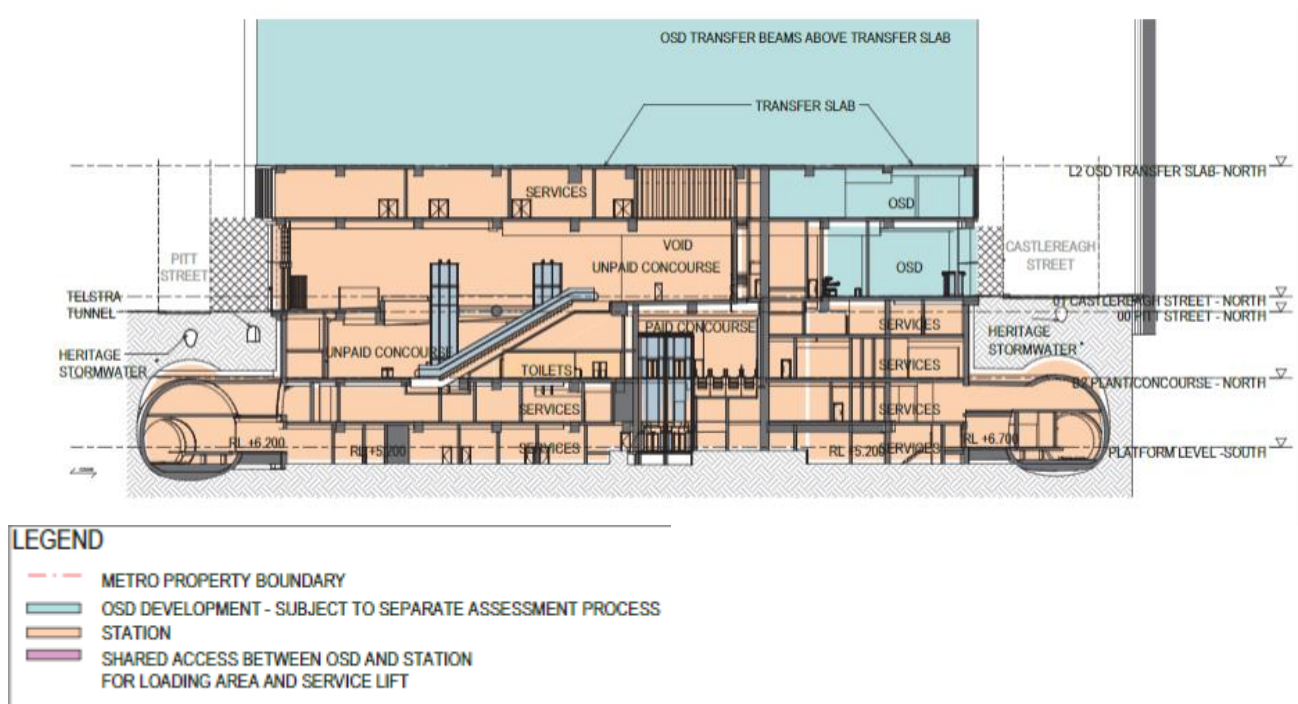


Figure 2: Sydney Metro Alignment Map (Source: Sydney Metro)

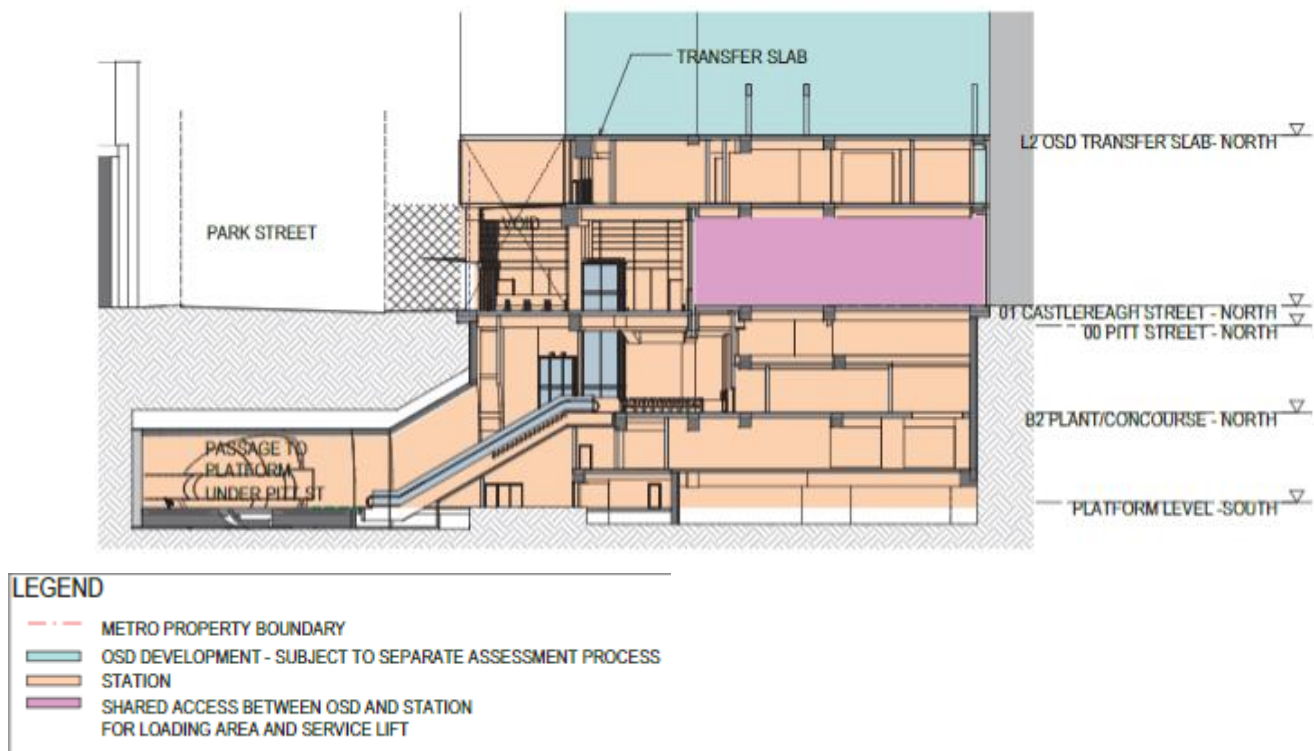
On 9 January 2017, the Minister for Planning approved the Sydney Metro City & Southwest - Chatswood to Sydenham project as a Critical State Significant Infrastructure project (reference SSI 15_7400) (CSSI Approval). The terms of the CSSI Approval includes all works required to construct the Sydney Metro Pitt Street Station, including the demolition of existing buildings and structures on both sites (north and south). The CSSI Approval also includes construction of below and above ground works within the metro station structure for appropriate integration with over station developments.

The CSSI Approval included Indicative Interface Drawings for the below and above ground works at Pitt Street North Metro Station site. The delineation between the approved Sydney Metro works, generally described as within the “metro box”, and the Over Station Development (OSD) elements are illustrated below. The delineation line between the CSSI Approved works and the OSD envelope is generally described below or above the transfer slab level respectively.



Source: CSSI Preferred Infrastructure Report (TfNSW)

Figure 3: Pitt Street Station – North (East-West Section)



Source: CSSI Preferred Infrastructure Report (TfNSW)

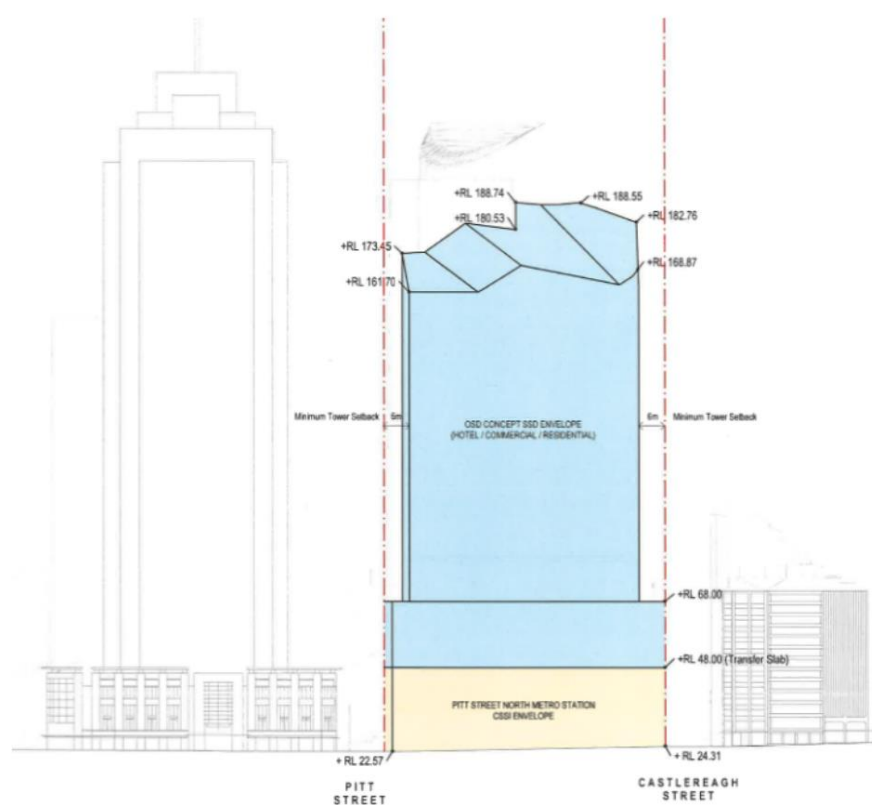
Figure 4: Pitt Street Station - North (North-South Section)

The Preferred Infrastructure Report (PIR) noted that the integration of the OSD elements and the metro station elements would be subject to the design resolution process, noting that the detailed design of the “metro box” may vary from the concept design assessed within the planning approval.

As such in summary:

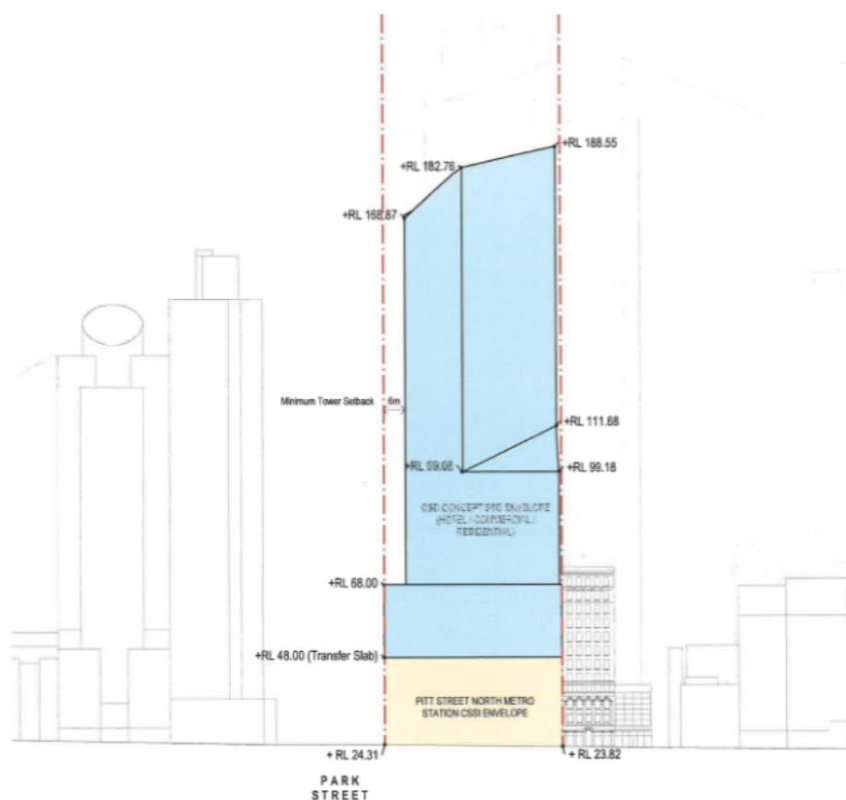
- The CSSI Approval provides consent for the construction of all structures within the approved “metro box” envelope for Pitt Street North.
- The CSSI Approval provides consent for the fit out and use of all areas within the approved “metro box” envelope that relate to the ongoing use and operation of the Sydney Metro.
- The CSSI Approval provides consent for the embellishment of the public domain, and the architectural design of the “metro box” envelope as it relates to the approved Sydney Metro and the approved Pitt Street North Station Design & Precinct Plan.
- Separate development consent however is required to be issued by the NSW DPIE for the use and fit-out of space within the “metro box” envelope for areas related to the OSD, and notably the construction and use of the OSD itself.

As per the requirements of clause 7.20 of the *Sydney Local Environmental Plan 2012*, as the OSD exceeds a height of 55 metres above ground level (among other triggers), development consent is first required to be issued in a Concept (formerly known as Stage 1) DA. This is described below.



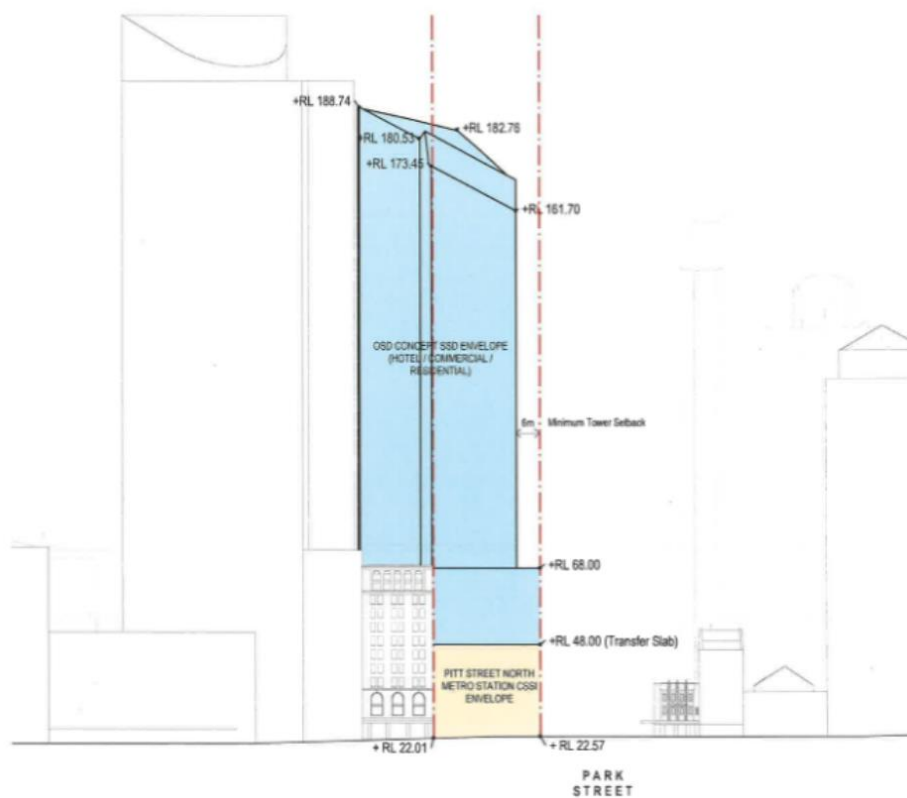
Source: SSD 8875 Concept Stamped Plans

Figure 5: Pitt Street North Concept SSD DA – Envelope - South Elevation



Source: SSD 8875 Concept Stamped Plans

Figure 6: Pitt Street North Concept SSD DA – Envelope - East Elevation



Source: SSD 8875 Concept Stamped Plans

Figure 7: Pitt Street North Concept SSD DA – Envelope - West Elevation

3.0 Sustainability Objectives

3.1 Overview

The sustainability framework for Pitt Street North OSD has been developed in line with the Sydney Metro City & Southwest Sustainability Strategy 2017-2024 June 2019 update. This includes objectives, targets and initiatives for Metro projects, many of which can also be applied to over station buildings. The requirements in that document have been expanded upon to include specific commitments and initiatives developed by the North OSD project team for inclusion or investigation in this project.

3.2 Sydney Metro Sustainability Objectives

Sydney Metro's sustainability objectives applicable to the project are provided below.

Table 3: Sydney Metro Objectives

Theme	Objective
Governance	Demonstrate leadership by embedding sustainability objectives into decision-making. Demonstrate a high level of performance against objectives and appropriate benchmarks. Be accountable and report publicly on performance.
Carbon & Energy Management	Improve the shift toward lower carbon transport. Reduce energy use and carbon emissions during construction. Reduce energy use and carbon emissions during operations. Support innovative and cost-effective approaches to energy efficiency, low carbon / renewable energy sources and energy procurement.
Environmental performance	Reduce sources of pollution and optimise control at source to avoid environmental harm. Comply with environmental obligations outlined in applicable project planning approvals.
Climate change resilience	Infrastructure and operations will be resilient to the impacts of climate change.
Resources – Water Efficiency	Minimise use of potable water. Maximise opportunities for reuse of rainwater, stormwater, wastewater and groundwater.
Resources – Waste & Materials	Minimise waste through the project lifecycle. Reduce materials consumption. Consider embodied impacts in materials selection. Maximise beneficial reuse of spoil.
Biodiversity Conservation	Protect and create biodiversity through appropriate planning, management and financial controls
Heritage Conservation	Protect and promote heritage through appropriate design, planning, and management controls.
Liveability	Promote improved public transport patronage by maximising connectivity and interchange capabilities. Provide well-designed stations and precincts that are comfortable, accessible, safe and attractive.
Community Benefit	Make a positive contribution to community health and well-being.

Theme	Objective
	<p>Ensure community and local stakeholder engagement and involvement in the development of the project.</p> <p>Contribute to the delivery of legacy projects to benefit local communities.</p> <p>Create opportunities for local business involvement during the delivery and operations phases.</p> <p>Consider community benefit of residual land development.</p> <p>Minimise negative impacts on the community and local businesses during construction and operation.</p>
Supply chain	Influence contractors, subcontractors and materials suppliers to adopt sustainability objectives in their works and procurement.
Workforce Development	<p>Increase opportunities for employment of local people, participation of local businesses, and participation of small and medium sized enterprises (SMEs).</p> <p>Enable targeted and transferable skills development which resolves local and national skills shortages, supports industry to compete in home and global markets, and embeds a health and safety culture within all induction and training activities, promoting continuous improvement.</p> <p>Increased workforce diversity and inclusion, targeting indigenous workers and businesses, female representation in non-traditional trades, and long term unemployed.</p> <p>Inspire future talent and develop capacity in the sector, engaging young people via education and work experience, collaborating with higher education institutions to provide programs responding to rapid transit and other infrastructure requirement, and supporting vocational career development through apprenticeships and traineeships.</p>
Economic	<p>Consider adopting a Whole of Life Costing model to maximise sustainability benefits.</p> <p>Optimise development opportunities for residual land.</p> <p>Capture sustainability benefits in the business case for the project.</p>

4.0 Sustainability Framework & Design Response to SEARs Requirements

4.1 Ecologically Sustainable Development (ESD)

This section of the report details how ESD principles (as defined in clause 7(4) Schedule 2 of the EP&A Regulation 2000) will be incorporated in the design, construction and ongoing operation of the development.

Table 4: Incorporation of ESD principles in line with SEARs

EP&A Regulation 2000 Clause	ESD Responses
<p>4(a) precautionary principle, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:</p> <p>(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and</p> <p>(ii) an assessment of the risk-weighted consequences of various options.</p>	<p>The possible impact of this project on the environment has been evaluated and the mitigation of practicable, serious and irreversible damage has been considered through the targeting of a minimum 6 Star Green Star rating, 5 Star NABERS for Offices Base Building Energy rating and 3.5 Star NABERS for Offices Whole Building Water rating.</p> <p>Environmental degradation during construction will be reduced through the implementation of a well-thought-out construction management plan. During the operational phase, environmental risk from greenhouse gas emission will be reduced through a responsive building design, best practice commissioning and tuning process, and advanced metering and monitoring. The inclusion of efficient appliances, systems and services will further reduce potential impact from carbon emissions during operation.</p> <p>Environmental risks from Climate Change were also weighted and mitigation strategies are included in the ESD framework.</p>
<p>4(b) inter-generational equity, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.</p>	<p>The assurance for environmental diversity and enhanced productivity of the future generations are endeavoured to be achieved by following the ESD framework proposed for this project. A Green Star certification and commitment to NABERS rating will ensure higher environmental credentials are maintained for the future occupants.</p> <p>The health and wellbeing of future occupants and visitors is addressed by ensuring excellent indoor environmental quality, including; thermal, visual and acoustic comfort, and the achievement of exceptional daylighting and air quality as defined in the ESD framework.</p> <p>A climate risk and adaptation assessment has been undertaken to ensure productivity of the future environment is maintained within a changing climate.</p>

<p>4(c) conservation of biological diversity and ecological integrity, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration.</p>	<p>The ESD framework includes biodiversity, ecological conservation and integrity as fundamental obligations for this project. In compliance with this requirement, the building includes an integrated landscape design which will foster biodiversity and enhance the ecological value of the site. The development and implementation of an environmental management plan during construction will reduce sources of pollution, minimise environmental harm and comply with environmental obligations.</p>
<p>4(d) improved valuation, pricing and incentive mechanisms, namely, that environmental factors should be included in the valuation of assets and services, such as: (i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement, (ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste, (iii) environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.</p>	<p>A sustainable procurement strategy will be developed during construction to influence contractors, subcontractors and materials suppliers to adopt environmentally and socially responsible procurement process.</p> <p>The ESD framework also proposes financial transparency to ensure market competitiveness for fair and cost-effective delivery of the project.</p> <p>Green Star and NABERS rating pathways provide incentives for reducing pollution and material waste during construction and resource efficiency during the operational phase of the project. A best practice commissioning & tuning processes also ensures carbon emission reductions and operational cost savings.</p>

4.2 Project Specific Sustainability Framework

The following sustainability framework has been developed for this project including targets and proposed initiatives. This framework also addresses the SEARs requirements and captures all the sustainability categories that apply to the project as well as supporting the Sydney Metro objectives outlined in Section 4.2.

The framework will be used throughout the design and construction stages to inform and refine sustainability solutions. The table below details how the proposed development will reflect national best practice sustainable building principles to improve environmental performance. It also summarises the initiatives that will be incorporated in the development to ensure energy and water efficiency. Best practice in waste management strategy will be pursued as part of the Green Star certification pathway, in which the Operational Waste Management Plan details out the operational and design requirements for refuse management facilities. The sustainability strategy outlined in the framework below has been prepared in line with concept approval.

Table 5: Sustainability Framework for Pitt St North

Theme	Objective	Target, Strategy & Initiatives
Governance	Demonstrate a high level of performance against objectives and appropriate benchmarks.	<p>Achieve 6-Star Green Star rating using Green Star Design & As-Built (v1.3¹) rating tool.</p> <p>Achieve the following ratings for the office space only:</p> <ul style="list-style-type: none"> 5 Star NABERS for Offices Base Building Energy rating 3.5 Star NABERS for Offices Whole Building Water rating <p>Please refer to Section 4.4 BCA Section J, Section 4.5 Green Star, and Section 4.6 NABERS.</p>
Carbon & energy Management	<p>Reduce energy use and GHG emissions, in transport, during construction and operation.</p> <p>Incorporate passive design measures to minimise energy consumption.</p> <p>Support innovative and cost-effective approaches to energy efficiency, low-carbon / renewable energy sources and energy procurement.</p>	<p>Develop and implement a construction environmental management plan during construction to manage construction energy and GHG emissions.</p> <p>Minimise energy demand of building through passive design, efficient systems, services and appliances.</p> <p>Adequate sun shading devices will be implemented to mitigate against excessive solar gain. A continuous band of external horizontal sun-hoods of varying depth will be provided on all levels of the tower facades. The design of the sun-hood will be responsive to local overshadowing and solar heat gain. The shading devices along with high performance glazing of the façade will optimise heat gain and maximise comfort.</p> <p>Incorporate Building Air tightness testing targets for façade.</p> <p>Best practice commissioning & tuning processes will be implemented, with independent verification, enhanced operations and maintenance information provided to facilities management and building user information provided to occupants to encourage more efficient use of systems.</p> <p>A building management control system will provide advanced metering and monitoring of energy systems.</p> <p>Transport carbon requirements minimised through delivery of the Pitt St Metro Station and proximity of the development to a large number of varied amenities within walking distance - the project achieves a walkscore of 100% according to www.walkscore.com.</p> <p>Please refer to Section 4.5 Green Star</p>
Environmental performance	<p>Reduce sources of pollution and optimise control at source to avoid environmental harm.</p> <p>Comply with environmental obligations outlined in applicable project planning approvals.</p>	<p>A best practice environmental management plan will be developed and implemented during construction.</p>

¹ Oxford has committed to a Green Star Design & As-Built v1.2 rating however the current version of Green Star is v1.3 which will be targeted on this project.

Theme	Objective	Target, Strategy & Initiatives
Climate change resilience	Design for resilience to the impacts of climate change.	<p>A climate risk and adaptation assessment has been undertaken to identify practical actions to be taken to manage risks from climate impacts and make the building more resilient.</p> <p>The Climate Change Adaptation Plan (CCAP) has been undertaken in accordance with the following standards to meet the requirements of Green Star Design and As-Built v1.3 Credit 3 Adaptation and Resilience: AS 5334:2013 - Standard for climate change adaptation for settlements and infrastructure.</p> <p>ISO31000-2009 Risk Management – Principles and Guidance.</p> <p>Climate Change Risks and Impacts, A guide for Government and Business.</p>
Resources – Water Efficiency	<p>Minimise use of potable water.</p> <p>Maximise opportunities for reuse of rainwater, stormwater, wastewater and groundwater.</p>	<p>Water-efficient fittings, fixtures and appliances will be installed to minimise water demand during operation.</p> <p>Rainwater harvesting for reuse in toilet flushing and landscape irrigation.</p> <p>Condensate recovery for reuse.</p> <p>Best practice commissioning & tuning processes will be implemented, with independent verification, enhanced operations and maintenance information provided to facilities management and building user information provided to occupants to encourage more efficient use of systems.</p> <p>Please refer Section 4.5 Green Star for further details.</p>
Resources – Waste & Materials	Minimise waste and reduce negative environmental impacts of construction materials and practices over the project lifecycle.	<p>The following initiatives could be implemented to minimise waste and negative environmental impacts of materials used during construction, depending upon other technical requirements:</p> <ul style="list-style-type: none"> Concrete mixes to reduce Portland Cement content and recycled aggregates. Timber to be reused or sourced from certified suppliers. Where possible, minimising inclusion of PVC in formworks, pipes, flooring, blinds & cables. Preference more sustainable materials (such as those with recycled or reused content, low embodied carbon, third-party environmental / social certification etc) Divert a minimum percentage of non-hazardous construction / demolition waste from landfill via reuse or recycling. The following initiatives could be implemented to minimise waste and negative environmental impacts of materials during operation: Best practice refuse management for the collection, separation, storage, transfer and disposal of refuse within the development. Regular waste streams to include general, comingled, secure paper, oil, food waste, cardboard and glass. Best practice equipment and the presence of a monitoring and maintenance plan to support on-going inspections and maintenance of waste and related equipment and facilities.

Theme	Objective	Target, Strategy & Initiatives
Biodiversity Conservation	Protect and create biodiversity through appropriate planning, management and financial controls.	A landscaped outdoor terrace is being provided on Level 10 and 11 to enhance the ecological value of the site and provide green spaces for occupants to enjoy.
Heritage Conservation	Protect and promote heritage through appropriate design, planning, and management controls.	No existing heritage structure in development scope.
Liveability, health & wellbeing	Encouraging active, social, meaningful lives and providing the buildings, infrastructure and spaces to support good health and wellbeing for all ages.	<p>Liveability is improved through the provision of public transport improving connectivity and access.</p> <p>The wellbeing of visitors and occupants is being addressed through the design by considering features which improve the indoor environment quality of the buildings. Features which will be considered include:</p> <ul style="list-style-type: none"> ▪ High performance façade incorporating shading, high-performance glazing and insulation will improve occupant comfort and reduce air-conditioning costs. ▪ An appropriate acoustic design, addressing internal noise levels, reverberation time and acoustic separation. ▪ An electric lighting design with appropriate lighting levels eliminating lighting glare and providing control for users. ▪ High Visual Light Transmittance glass for maximising daylight penetration. ▪ Internal blinds for minimising glare discomfort risk. ▪ Use of low VOC paints, adhesives, sealants and carpets and low formaldehyde emission engineered wood products in all internal areas. ▪ End of trip facilities.
Supply Chain	Influence contractors, subcontractors and materials suppliers to adopt sustainability objectives in their works and procurement.	<p>Develop and implement a sustainable procurement strategy during construction, to cover:</p> <ul style="list-style-type: none"> ▪ Environmentally responsible procurement. ▪ Socially responsibly procurement including ethical sourcing and modern slavery. ▪ Transparency.

4.3 Concept Condition B9

4.3.1 Incorporation of Ecological Sustainable Development Principals

Principals of ecologically sustainable development (ESD) have been incorporated into the proposed design, construction and ongoing operation of the project. Industry leadership and the ambition for high sustainable performance has been demonstrated through the targeting of a minimum 6 Star Green Star rating. Energy use and carbon emissions will be reduced during construction through the implementation of a construction management plan. Passive design and the

inclusion of efficient systems, services and appliances will seek to reduce energy use and carbon emissions during operation. Energy usage will be further reduced through a best practice commissioning and tuning process and the provision of advanced metering and monitoring of systems. An environmental management plan will be developed and implemented during construction to reduce sources of pollution, minimise environmental harm and comply with environmental obligations. A climate risk and adaptation assessment has been undertaken to identify practical actions to be taken to manage risks from climate impacts and make the building more resilient.

Water reducing measures will be incorporated, through the installation of proposed water-efficient fittings, fixtures and appliances. Potable water use will be minimised through rainwater reuse for toilet flushing and landscape irrigation. The commissioning & tuning processes will also provide operations and maintenance information for better efficiency of systems. A landscaped outdoor terrace is being provided on Level 10 and 11 to create biodiversity and enhance the ecological value of the site. The wellbeing of occupants and visitors is being addressed through the consideration of features which improve the indoor environment quality (IEQ) of the building. Key features which will be considered include facade, acoustic, electric lighting and daylighting design. Low-Volatile organic compounds (VOC) paints, carpets, sealants and adhesives and low formaldehyde engineered wood products will also promote liveability and occupant well-being. A sustainable procurement strategy will be developed during construction to influence contractors, subcontractors and materials suppliers to adopt environmentally and socially responsible procurement.

The ESD credentials are in accordance with the framework, targets and visions of the ESD Report lodged with the EIS prepared by Sydney Metro (August 2018).

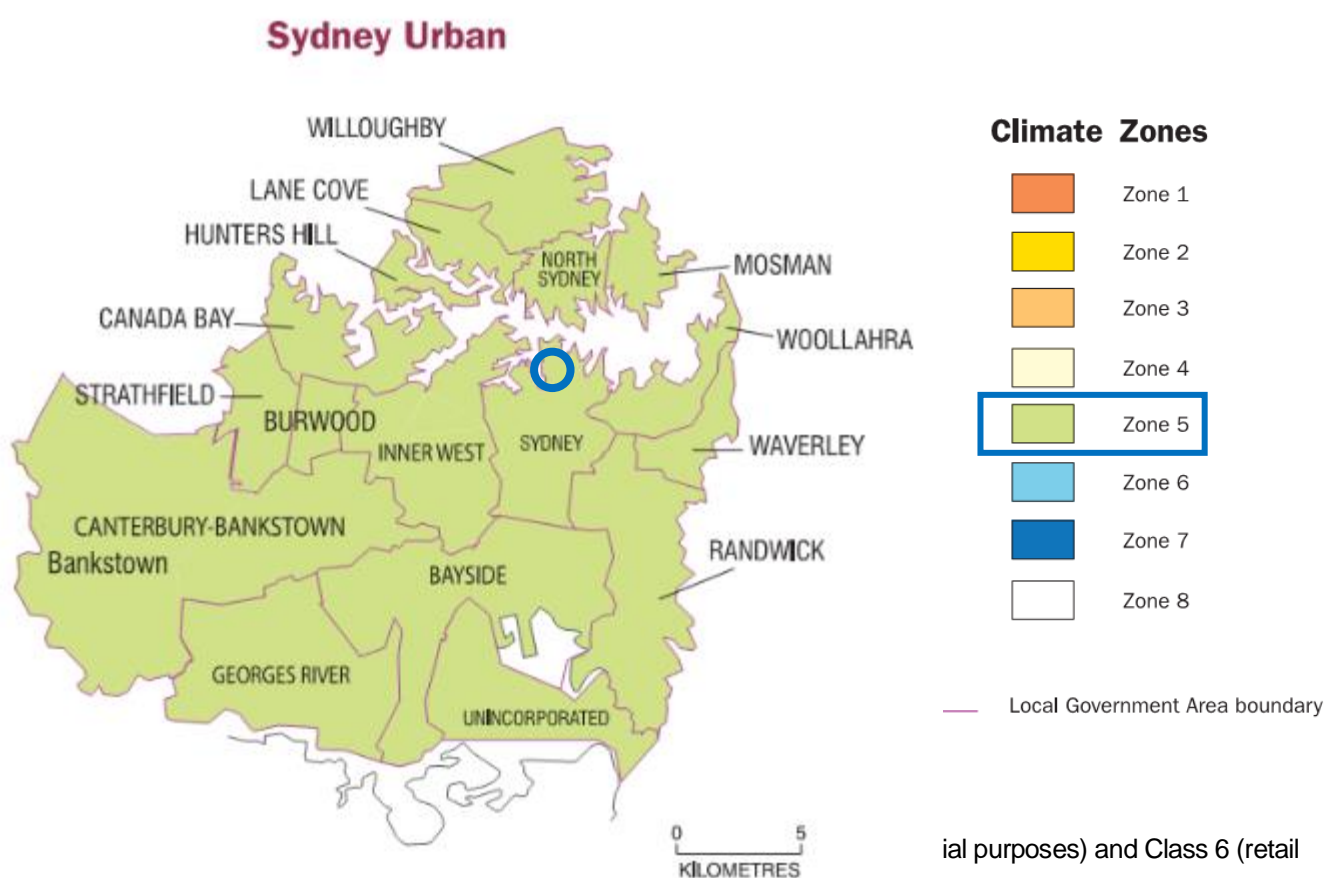
4.4 NCC Section J

Preliminary JV3 modelling has been undertaken for the project to inform the façade design.

The energy model demonstrates that the energy consumed by the proposed building is less than that of a DTS reference building, as required for Section J façade compliance.

4.4.1 Location and Weather Zones

The proposed development is located in Sydney NSW, which is categorised as Climate Zone 5 as defined by the NCC and as illustrated below.



4.4.3 JV3 Process

There are two aspects to JV3 modelling. The first requires that the annual energy consumption of both the proposed building with proposed services, and the proposed building with deemed to satisfy services, does not exceed the annual energy consumption for the deemed to satisfy building with deemed to satisfy services under defined operating conditions. The second aspect is designed to limit the “trading” between the envelope and services of a building by requiring that the allowance is also not exceeded using deemed-to-satisfy services.

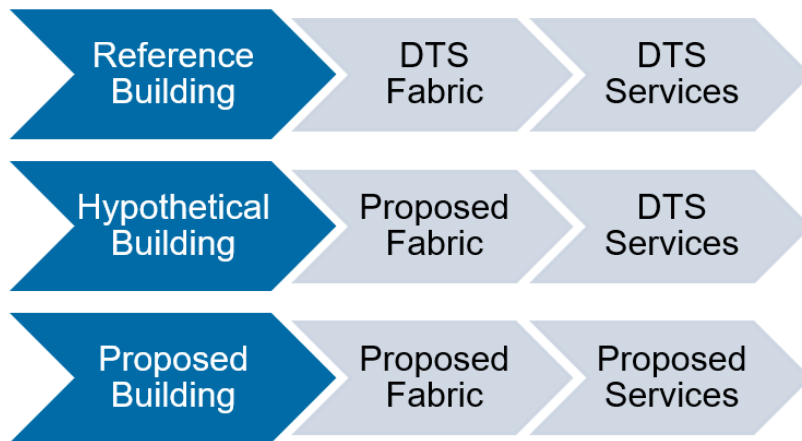


Figure 9: JV3 Method validation process diagram

For a fabric only assessment the annual energy consumption of the proposed building with deemed to satisfy services, is required not to exceed the annual energy consumption for the deemed to satisfy building with deemed to satisfy services under defined operating conditions.

4.4.4 JV3 Verification Methodology

The JV3 verification methodology requires the proposed building consuming the same or less energy than a DTS reference building, where only the building envelope (fabric and glazing) have changed. This method is applicable to Classes 3, 5, 6, 8 and 9 buildings.

The JV3 verification methodology prescribes that the annual greenhouse gas (GHG) emission of both the proposed building with proposed services, and the proposed building with DTS services, is not to exceed the annual GHG emission for the reference building under defined operating conditions. The term “GHG emission” is used which takes account the fuel cycle emissions factors of the building through its services published by the Australia Government (as per Table 3a of NCC 2019 Specification JVb).

The steps to using this Verification Method are:

- Calculate the theoretical annual GHG emission of the services as outlined in the NCC 2019 Part A1 (Interpretation) means mechanical or electrical systems that use energy to provide air-conditioning. They do not include systems used solely for emergency purposes, cooking facilities and portable appliances (NCC 2019).
- Calculate the theoretical annual GHG emission of the reference solution, using the criteria in Specification JV, with the services modelled as if they were at the deemed to satisfy minimum standard and the air-conditioning system type described in JV3(b). In effect using proposed façade with JV profile and JV services.
- Compare the theoretical GHG emission of the Hypothetical Case to the GHG emission for the DTS Reference Case, to ensure that the emission does not exceed that of the reference building.

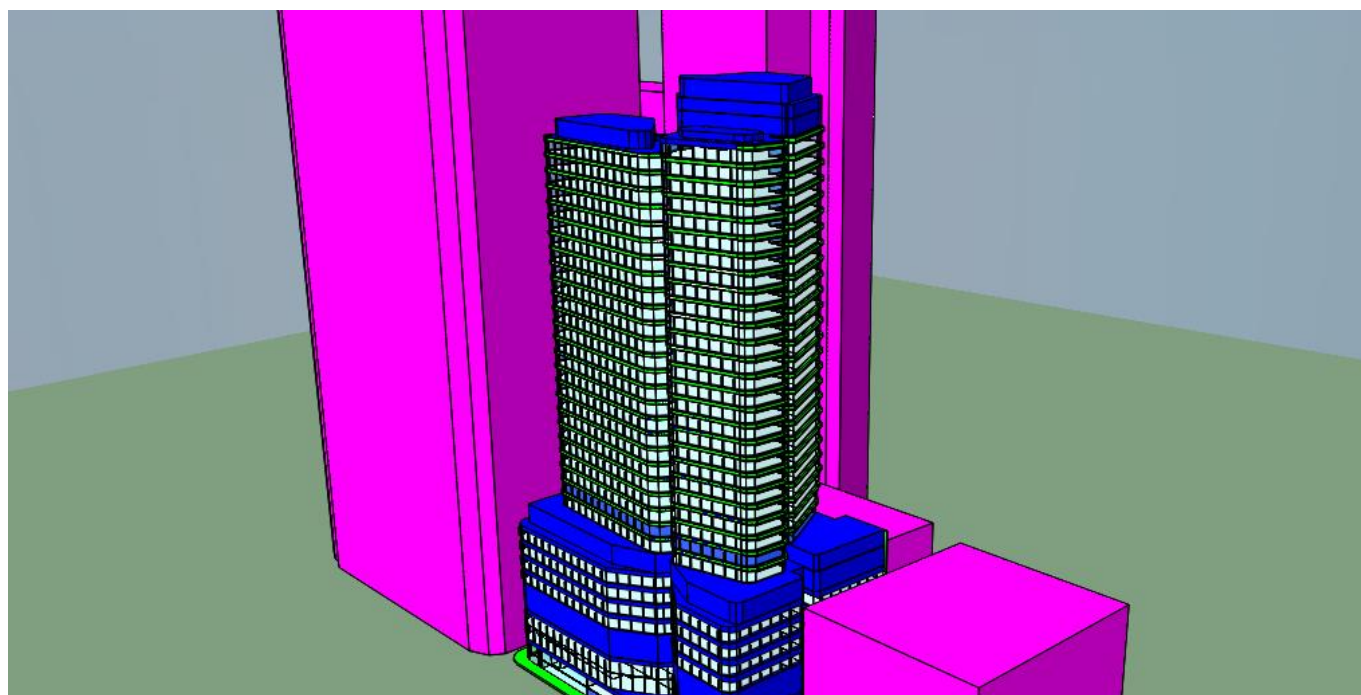


Figure 10: 3D Model of Building

4.4.5 JV3 Assessment Annual GHG Emission Results

The results show that the Hypothetical building with proposed façade design has a lower GHG emission using the JV3 verification method than the Reference building with Deemed -To -Satisfy (DTS) façade and DTS services. The results confirm the design is compliant with NCC 2019 Section J1.

Table 6: JV3 Assessment Energy Consumption Results

Models	GHG emission (kgCO ₂)			Total GHG emission (kgCO ₂)	Compliant
	Heating	Cooling	Heat Reject		
DTS	101,426	238,704	185,472	525,602	✓
HYP	91,975	241,010	187,264	520,249	

4.4.6 Building Fabric

For new building works, DTS thermal performance requirements must be met for opaque fabric, as per table below.

Table 7: Minimum Building Fabric Thermal Requirements

Element	Total R value required
Roof	R3.70
External walls	R2.80
Internal envelope walls	R1.00
Suspended floor to unconditioned spaces	R2.00

4.4.7 Compliant Glazing

The JV3 results above is based on Table 8 below, which represents the worst-case scenario of flat and curved glazing combination for the building's façade proposed by the Façade Consultant for this project. The flat and curved glazings were modelled as per the marked-up plan below.

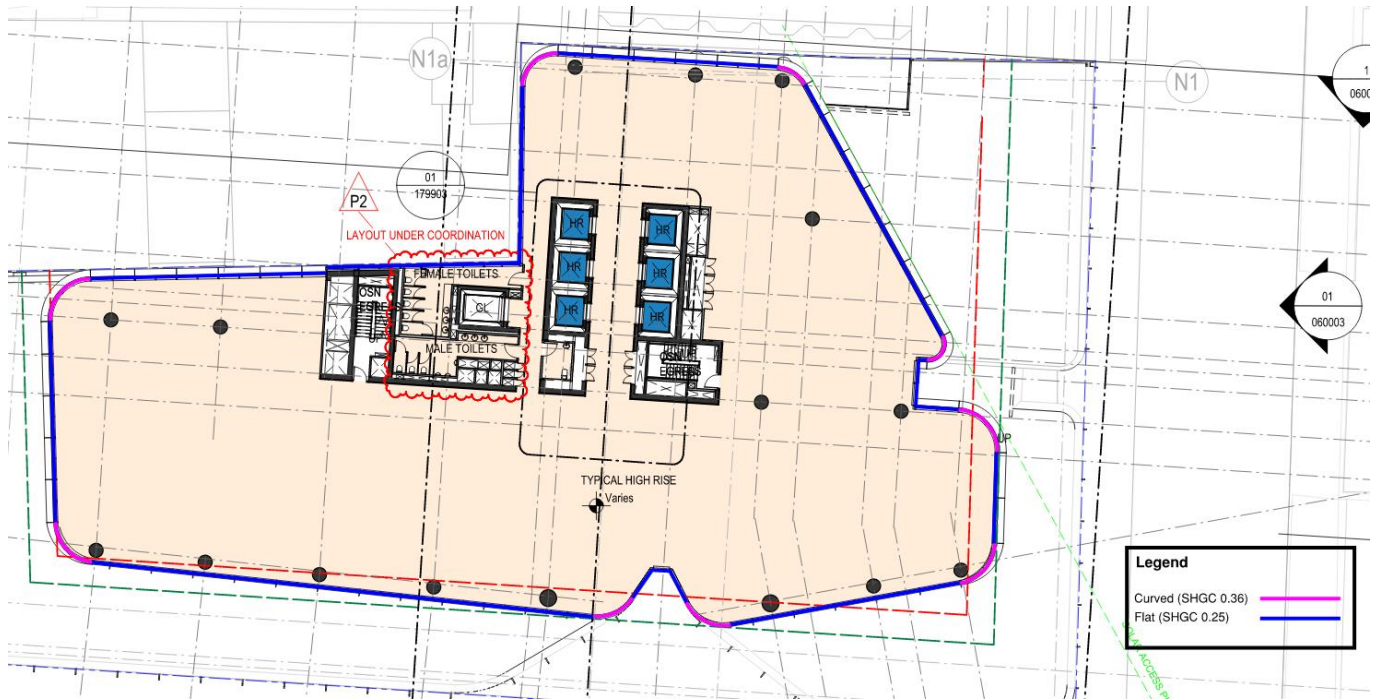


Figure 11: Illustration of Curved and Flat Glazing for JV3 Assessment

Table 8: Glazing Thermal Performance for JV3 Assessment

Thermal Performance Requirements	Glazing Thermal Properties	
	U-Value (W/m ² K)	SHGC
Class 6 (Retail) – general retail spaces	6.50	0.50
Class 6 (Retail) – sliding doors and operable windows if any	6.50	0.50
Class 5 (Commercial) – Flat glazing	3.40	0.25
Class 5 (Commercial) – Curved glazing	3.40	0.36

*Window Thermal Performance U-values are based on AFRC figures for glass and frame










The U-value of a typical double-glazed window system (3.40W/m²K) is assigned to commercial façade as detailed façade design and U-value is not available at the time of this assessment. The thermal performance requirements listed in table 8 are pending design development.

4.5 Green Star

The Green Building Council Australia (GBCA) Green Star – Design & As Built rating tool assesses the sustainability attributes of a building through nine categories outlined in the following table.

Each category contains a number of different credits, and each credit is worth 1 or more points.

Table 9: Green Star Objectives

	Category name	Aim
	Management	Aims to encourage and reward the adoption of practices and processes that support best practice sustainability outcomes throughout the different phases of a project's design, construction and ongoing operation.
	Indoor Environment Quality	Aims to encourage and reward initiatives that enhance the comfort and well-being of occupants. The credits within this category address issues such as air quality, thermal comfort and acoustic comfort.
	Energy	Aims to reward projects that are designed and constructed to reduce overall greenhouse emissions from operations by addressing energy demand reduction, use efficiency and generation from alternative sources.
	Transport	Aims to reward projects that facilitate a reduction on the dependency of private car use as an important means of reducing overall greenhouse gas emissions, as well as to encourage the provision of alternative forms of transportation.
	Water	Aims to encourage and reward initiatives that reduce the consumption of potable water through measures such as the incorporation of water efficient fixtures and building systems and water re-use.
	Materials	Aims to address the consumption of resources for the project, by encouraging the selection of low-impact materials.
	Land use & ecology	Aims to reduce the negative impacts on sites' ecological value as a result of urban development and reward projects that minimise harm and enhance the quality of local ecology.
	Emissions	Aims to assess the environmental impacts of 'point source' pollution generated by projects and reduce their effects on the atmosphere, watercourse and native animals.
	Innovation	Aims to recognise the implementation of innovative practices, processes and strategies that promote sustainability in the built environment.

The Pitt Street North OSD development is targeting a 6-Star Green Star rating using the Green Star Design & As-Built v1.3 rating tool. A certified 6 Star Green Star rating is achieved if the project achieves at least 75 points. A margin is typically added to minimise risk of achieving the rating.

Points targeted fall into the following categories:

% of total score by category

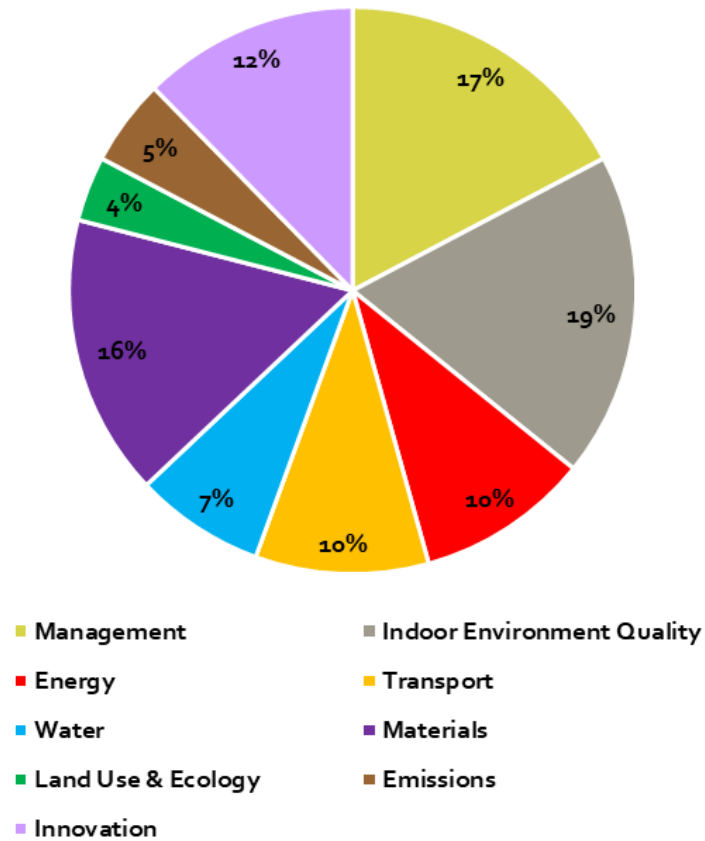


Figure 12: Green Star points by category

This strategy is subject to change as the design develops and may be updated at any time so long as the targeted rating is achieved.

4.6 NABERS

4.6.1 Introduction to NABERS Ratings

The National Australian Built Environment Rating System (NABERS) is a performance-based rating system for buildings. Ratings are undertaken based on 12 months of operational data.

Four types of NABERS ratings are available:

- Energy
- Water
- Waste – office only
- Indoor Environment – office only



NABERS Ratings are available for offices, shopping centres, data centres, hotels and single dwelling homes.

A NABERS Energy rating awards between zero and six stars for reducing greenhouse gas (GHG) emissions in operation. The more stars in a NABERS Energy rating, the lower the greenhouse gas emissions for the rated premises. Ratings are available for:

- Base building
- Tenancy
- Whole building

A base building rating assesses GHG emissions associated with base building services only, including common-area lighting and power, lifts and escalators, base building air conditioning and ventilation, exterior lighting & signage and car park ventilation and lighting.

To ensure fair comparison, the consumption figures are adjusted for factors such as building area, hours of use, climate, equipment density (tenancy and whole building ratings), proportion of centrally serviced area, hours of service, trading days and the greenhouse intensity of the energy source. GreenPower™ purchases are taken into account but the rating without GreenPower is also displayed.

A NABERS Water rating awards between zero and six stars for reducing potable water consumption from mains supply. The higher the number of stars awarded, the lower the amount of potable mains water used. Ratings are available for whole buildings only.

4.6.2 NABERS and the Pitt Street Metro North OSD Project

The following NABERS commitments are made for the office space only:

- 5 Star NABERS for Offices Base Building Energy rating
- 3.5 Star NABERS for Offices Whole Building Water rating

NABERS Energy and Water ratings are often inversely related. This means that increasing the rating of one rating can have an adverse impact on the rating of the other.

5.0 Conclusion

Pitt Street North OSD will apply ESD principles in the design, delivery and operation of the project, and third-party verification will be provided through a range of environmental certifications, including:

The following commitments have been made for the development:

- Achieve 6 Star Green Star rating using Green Star Design & As-Built (v1.3) rating tool.

The following commitments have been made for the office space only:

- 5 Star NABERS for Offices Base Building Energy rating
- 3.5 Star NABERS for Offices Whole Building Water rating

The project will develop the following initiatives during the detailed design phase:

- Efficient building services, systems, equipment and controls incorporating sub-metering for improved tracking of operational performance.
- Passive design principles to improve thermal comfort and reduce air-conditioning energy through a high-performance facade with energy-efficient glazing, insulation and fixed shading.
- Regenerative lifts with best-in-class energy efficiency performance.
- Rainwater capture and reuse for toilet flushing and landscape irrigation.
- Close proximity to public transport and amenities.
- More sustainable timber and concrete specification.
- Low-Volatile organic compounds (VOC) paints, carpets, sealants and adhesives and low formaldehyde engineered wood products.
- Diversion of construction waste from landfill and on-site operational waste management facilities.
- A climate risk and adaptation assessment to identify practical actions to be taken to manage risks from climate impacts and make the building more resilient.

Sustainability initiatives proposed will be developed in further detail as the design progresses. Performance against all the relevant requirements will be tracked and implemented throughout construction and delivery of the Pitt Street North OSD development. Pitt Street North OSD will achieve the required targets as stipulated in the SEARs and SSDA Stage 1 Conditions through implementation of design solutions.

Cundall Johnston & Partners PTY

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