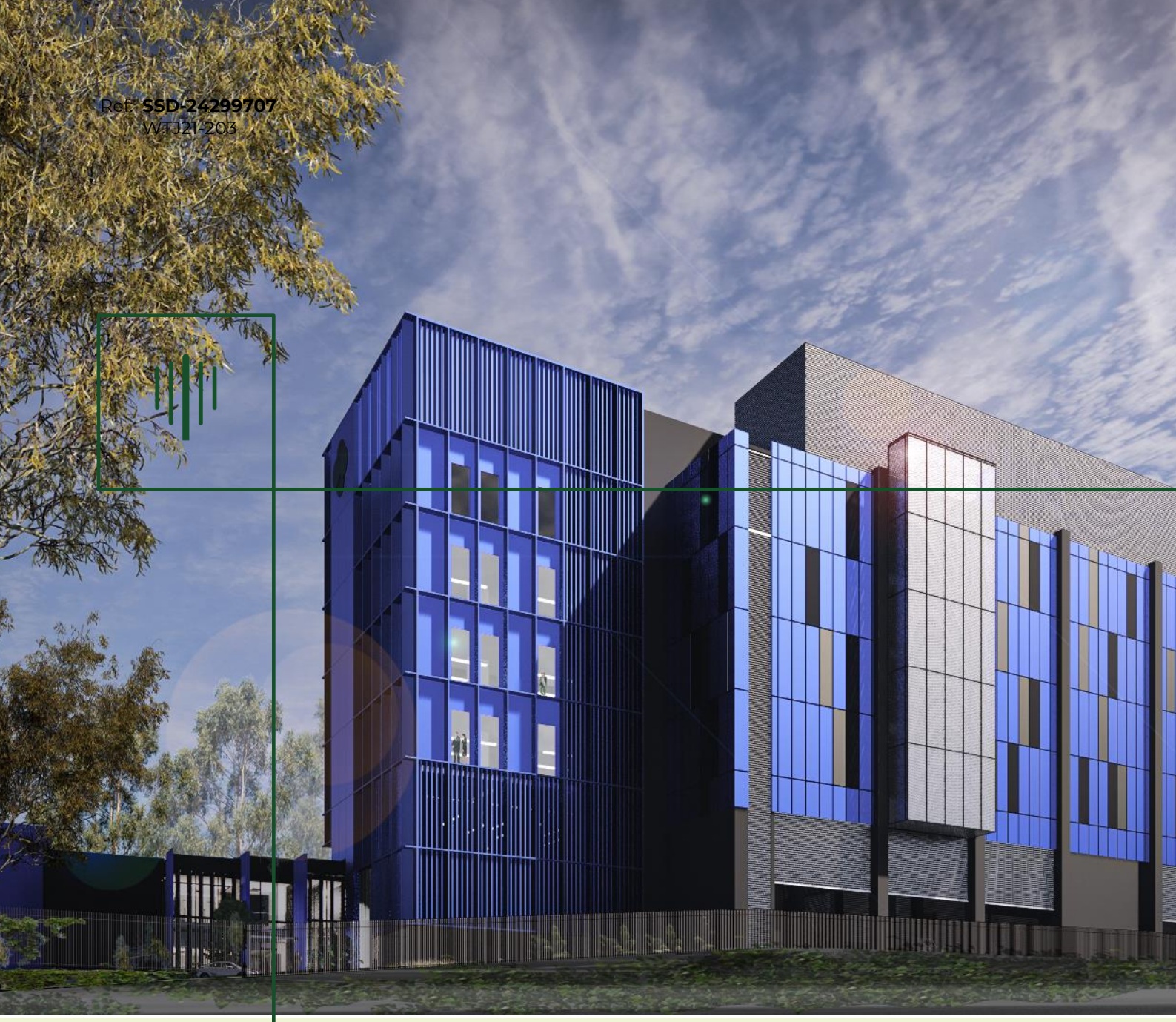
Ref: **SSD-24299707**
WTJ21-203



WILLOWTREE PLANNING

ENVIRONMENTAL IMPACT STATEMENT:
TALAVERA ROAD DATA CENTRE CAMPUS EXPANSION (IC3 SUPER WEST)

17 – 23 TALAVERA ROAD, MACQUARIE PARK
LOT 527 DP 752035

—

Prepared by Willowtree Planning Pty Ltd
on behalf of Macquarie Data Centres

8 November 2021

SYDNEY

—

Suite 4, Level 7
100 Walker Street
North Sydney NSW 2060

NEWCASTLE

—

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GOLD COAST

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WILLOWTREE
PLANNING

DOCUMENT CONTROL TABLE			
Document Reference:	SSD-24299707_Environmental Impact Statement		
Contact:	Eleisha Burton		
Version and Date	Prepared by	Checked by	Approved by
Version No. 0 – DRAFT (18/08/2021)	Eleisha Burton Associate	Andrew Cowan Director	
Version No. 1.1 (08/11/2021)	Eleisha Burton Associate	Andrew Cowan Director	Andrew Cowan Director

SECTION 4.12 CERTIFICATE

Declaration Form	**Submission of Environmental Impact Statement (EIS)** prepared under the *Environmental Planning and Assessment Act 1979 – Part 4, Division 4.3, Section 4.12*

EIS Prepared by

Name	Eleisha Burton
Qualifications	Bachelor of Planning Graduate Diploma of Environmental Management
Address	Suite 4, Level 7 100 Walker Street North Sydney, NSW 2060

In Respect of	SSD-24299707 Talavera Road Data Centre Campus Expansion

Development Application

Applicant Name	Macquarie Data Centres
Applicant Address	Level 15 2 Market Street Sydney NSW 2000

Land to be Developed	17 – 23 Talavera Road, Macquarie Park: ▪ Lot 527 DP 752035
EIS	This document contains a complete EIS
Certificate	I certify that I have prepared the contents of this EIS to the best of my knowledge: ▪ it is in accordance with Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*, ▪ contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure to which the statement relates, and ▪ that the information contained in the statement is neither false nor misleading.

Signature

Name	Eleisha Burton
Position	Associate
Qualification	BPlan, JCU GradDipEnvMgt, CQU
Date	8 November 2021

Signature

Name	Andrew Cowan
Position	Director
Qualification	BURP, UNE MPD, UTS
Date	8 November 2021

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GLOSSARY OF KEY TERMS

TERM	MEANING
BAM	Biodiversity Assessment Methodology
BCA	Building Code of Australia
BC Act	*Biodiversity Conservation Act 2016*
BC Regulation	*Biodiversity Conservation Regulation 2017*
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offset Scheme
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CIV	Capital investment value
Council	City of Ryde Council
CTMP	Construction Traffic Management Plan
DA	Development Application
DCP	Development Control Plan
DP	Deposited Plan
DPIE	Department of Planning, Industry and Environment
EES	Environment, Energy and Science Group
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPA	Environment Protection Authority
EPBC Act	*Commonwealth Environment Protection and Biodiversity Conservation Act 1999*
EPI	Environmental Planning Instrument
EPL	Environmental Protection Licence
ESD	Ecologically Sustainable Development
FRNSW	Fire and Rescue NSW
FSR	Floor Space Ratio
GFA	Gross Floor Area
GHG	Greenhouse has
GSC	Greater Sydney Commission
ISEPP	*State Environmental Planning Policy (Infrastructure) 2007*
LGA	Local Government Area
LSPS	Planning Ryde – Draft Local Strategic Planning Statement 2019
MDC	Macquarie Data Centres
MNES	Matter of National Environmental Significance
MUSIC	Model for Urban Stormwater Improvement Conceptualisation
NSW RMS	NSW Roads and Maritime Services
OEH	NSW Office of Environment and Heritage
POEO Act	*Protection of the Environment Operations Act 1997*
RL	Reduced level
RDCP2014	*Ryde Development Control Plan 2014*
RLEP2014	*Ryde Local Environmental Plan 2014*
SEARs	Secretary's Environmental Assessment Requirements (SSD-24299707), dated 12 August 2021
SEPP	State Environmental Planning Policy
SEPP 33	*State Environmental Planning Policy No. 33 — Hazardous and Offensive Development*

SEPP 64	*State Environmental Planning Policy No 64—Advertising and Signage*
SIDRA	Signalised & unsignalised Intersection Design and Research Aid
Sqm or m²	Square metres
Subject site/site/study area	17 – 23 Talavera Road, Macquarie Park
SRD SEPP	*State Environmental Planning Policy (State and Regional Development) 2011*
TfNSW	Transport for NSW
Vegetation SEPP	*State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017*
VIA	Visual Impact Assessment
VPA	Voluntary Planning Agreement
Willowtree Planning	Willowtree Planning Pty Ltd
WM Act	*Water Management Act 2000*
WMP	Waste Management Plan
WSUD	Water Sensitive Urban Design

EXECUTIVE SUMMARY

This Environmental Impact Statement (EIS) has been prepared by Willowtree Planning Pty Ltd (Willowtree Planning), on behalf of Macquarie Data Centres (MDC). The EIS is submitted to the New South Wales (NSW) Department of Planning, Industry and Environment (DPIE), in support of an application for State Significant Development (SSD), for the construction and operation of a data centre, involving earth works, provision of infrastructure and construction of an expansion of an existing data centre at 17 – 23 Talavera Road, Macquarie Park (Lot 527 DP 752035). The proposal represents an extension to the approved data centre (LDA2018/0322) to allow for additional data storage capacity at the subject site, improving the overall operational efficiencies to be explored and provided to customers and the wider locality.

LDA2018/0322 informed the approval for the MDC Intellicentre 3 Super West (IC3w) development, which granted consent for a smaller extension to the existing data centre, of which Stage 1 (IC3e) has been completed, while Stage 2 (IC3w) has not commenced – refer to **Figure 3**. The intent of this application is to complete a further expansion of the constructed data centre, which would encapsulate the abovementioned Stage 2 works, plus additional built form.

In short, the proposal involves the construction and operation of an expansion to an existing data centre (identified as the IC3w development), comprising:

- a five-storey building
- ancillary office space and staff amenities
- a back-up power system, including lithium-ion batteries
- associated infrastructure, car parking, loading docks and landscaping

The proposed development is afforded to land at 17 – 23 Talavera Road, Macquarie Park, more formally described as Lot 527 DP 752035. Such land is described throughout this EIS as the 'subject site'.

The subject site is located within the City of Ryde Local Government Area (LGA) and is zoned B7 Business Park under the provisions of the *Ryde Local Environmental Plan 2014* (RLEP2014). Development for the purpose of a data centre falls within the definition of 'storage premises' (used for the storage of data and related information technology hardware), which is permissible with consent in the B7 Business Park zone, pursuant to Part 3, Division 3, Clause 27 of *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP).

In addition, the proposed development satisfies the definition of SSD pursuant to:

- Schedule 1, item 25 of *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP), being development for "storage premises used for the storage of data and related information technology hardware" that has a total power consumption of more than 10 megawatts.

As such, this EIS must be prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs).

Under the *Environmental Planning & Assessment Act 1979* (EP&A Act), it is required that a request for SEARs must be made prior to the lodgement of any application for SSD. SEARs were requested for the proposed development (reference: SSD-24299707) and later issued by the NSW DPIE on the 12 August 2021 (refer to **Appendix 1**).

In addition to the general requirements, the SEARs for the proposal outline several Key Issues to be addressed as part of this EIS, including:

1. Statutory and strategic context
2. Suitability of the site
3. Community and stakeholder engagement
4. Back-up power system
5. Noise and vibration
6. Air quality
7. Traffic and transport

8. Hazard and risk
9. Infrastructure requirements
10. Soil and water
11. Flood risk
12. Urban design and visual
13. Ecologically sustainable development
14. Greenhouse gas and energy efficiency
15. Biodiversity
16. Aboriginal cultural heritage
17. Non-Aboriginal cultural heritage
18. Socio-economic
19. Waste
20. Planning agreement/development contributions

The findings of this EIS identify that the proposal can be accommodated, subject to suitable management and mitigation measures, without any adverse environmental impacts beyond that considered appropriate by the relevant legislation.

Further, the proposed data centre expansion would be consistent with the objectives of ISEPP, RLEP2014 and relevant B7 Business Park zone. Based on the findings of this EIS, the proposal would support the continued use of the subject site for data storage. The proposal is suitable for the local context and shall not result in any significant environmental impact. As such, it is recommended that the proposal be supported by the NSW DPIE for approval, subject to reasonable and relevant conditions.

SITE CONTEXT

The subject site is legally described as Lot 527 DP 752035, more commonly known as 17 – 23 Talavera Road, Macquarie Park. The subject site has a total area of approximately 20,094 m^2, with access achieved via Talavera Road.

The subject site forms part of the Macquarie Park Corridor, which is strategic centre of Macquarie Park, being a health and education precinct and an important economic and employment powerhouse in Sydney's North District.

The subject site's historical context is best described through its currently commercial setting as an existing Data Centre (LDA2018/0322), adjoining surrounding commercial premises along Talavera Road, and forming part of the wider Macquarie Park Corridor. Land surrounding the subject site comprises the following land use zoning, including:

- B7 Business Park
- B3 Commercial Core
- B4 Mixed Use
- SP2 Infrastructure

The subject site is situated approximately 12.5 km northwest of the Sydney CBD and 11.3 km northeast of Parramatta. It is within close proximity to transport infrastructure routes (predominantly the bus and rail networks), as well as sharing direct links with the wider regional road network, including Talavera Road, Lane Cove Road, Epping Road and the M2 Motorway. These road networks provide enhanced connectivity to the subject site and wider locality. Additionally, the subject site is located within close proximity to active transport links, such as bicycle routes, providing an additional mode of accessible transport available to the subject site.

The proposed development would implement mitigation and protection measures, in order to preserve the natural, ecological and visual amenity of the subject site and surrounding areas. It is noted, that there are residential receivers further to the north of the subject site; however, it is considered that these receivers are satisfactorily separated from the proposed development by the M2 Motorway.

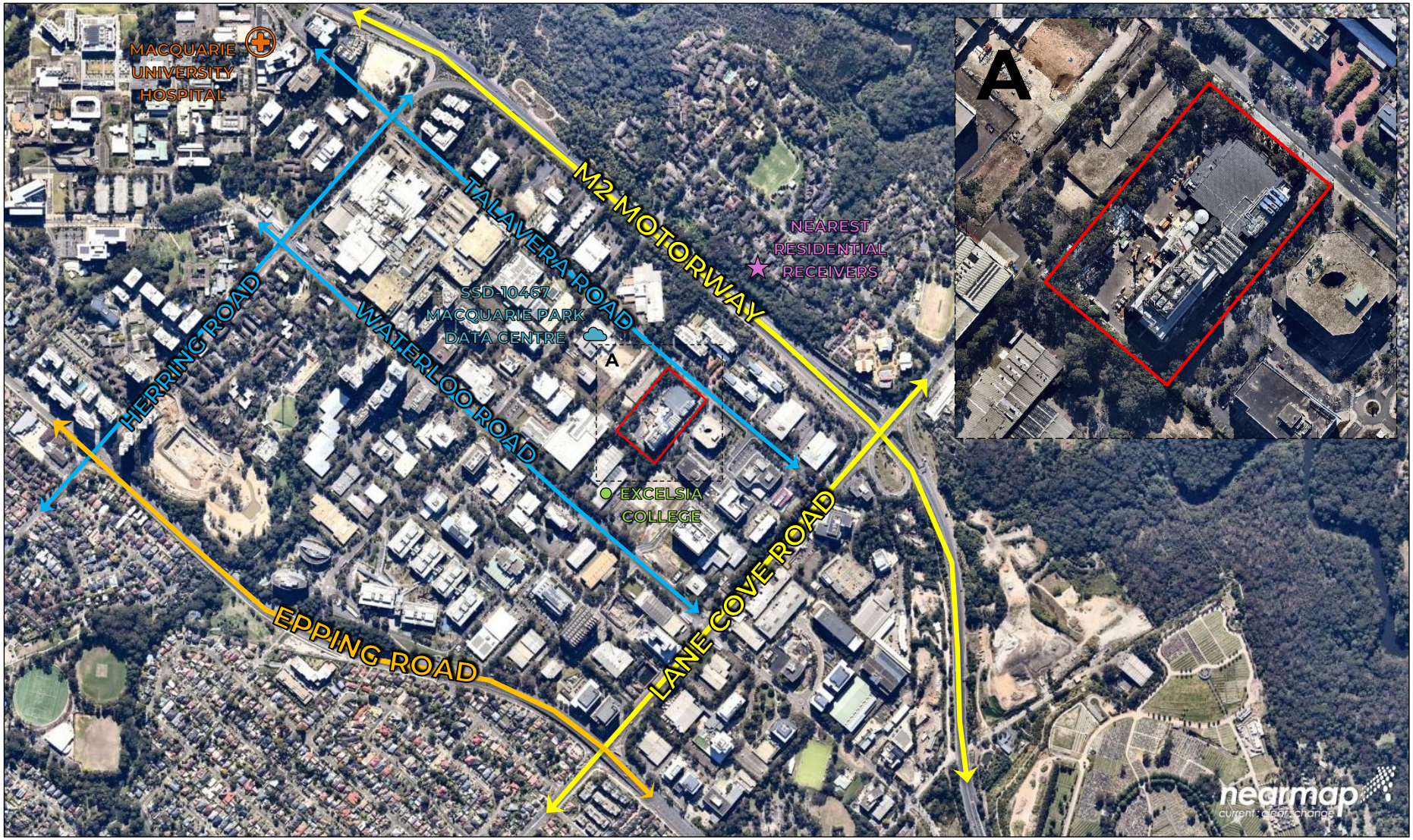


Figure 1 **Site Context Map (Source: Nearmap/Willowtree Planning, 2021)**

PROJECT DESCRIPTION

The proposal represents an extension to the approved data centre (LDA2018/0322) to allow for additional data storage capacity at the subject site, improving the overall operational efficiencies to be explored and provided to customers and the wider locality.

Development consent under this proposal is sought to expand the existing data centre, comprising the following aspects of development:

- Minor earthworks involving cut and fill works;
- Infrastructure comprising civil works and utilities servicing;
- Removal of 52 trees, retention of 58 trees, and planting of 47 new trees;
- Construction of a five (5) storey building extension, comprising up to:
  - An additional 9,097 m^2 of gross floor area (GFA)
  - 14 data halls
- Increase in total data centre capacity by an additional 33 megawatts (MW);
- Increase in the diesel storage capacity by an additional 418,000 litres (L);
- Additional 18 backup generators;
- Additional set of dual 33kV feeder;
- 71 on site car parking spaces;
- Complementary landscaping (2,732 m^2);
- Hours of operation being on a 24 hours per day, 7 days per week, basis.

The proposed development consists of an extension to the existing data centre, constructed under LDA2018/0322. Whilst Stage 1 (IC3e) of the development consent has been completed, the proposal of this SSD seeks to capture previously approved Stage 2 (IC3w) works, in addition to further built form.

In light of the particulars provided within **PART C** of this EIS, with respect to the current proposal, the following comparison table is provided to show the extent of change as compared to LDA2018/0322.

TABLE 1: COMPARISON – EXISTING APPROVAL VERSUS CURRENT PROPOSAL

Project Element	Existing Site (including Stage 1 of LDA2018/0322) *	Current Proposal (including expansion) *	Difference (+/-)
Total power consumption (MW)	28 MW	61 MW	+ 33 MW
Maximum building height	45 m	45 m	N/A
GFA	11,103 m^2	20,606 m^2	+ 9,079 m^2
No. back-up generators	16	34	+ 18
Diesel storage (L)	220, 400 L	638,400 L	+ 418,000 L
Car parking	101	71	- 30 *
Operational jobs	29	49	+ 20
Note: * consistent with Part 2, Condition 3 of LDA2018/0322			

PLANNING AND LEGISLATIVE FRAMEWORK

All relevant Federal and State legislation, as well as Environmental Planning Instruments (EPIs), have been considered in the preparation of this EIS. The proposal is satisfactory in terms of its legislative context, on the basis that:

- The proposal is permissible in the zone;
- The objectives of the zone are satisfied;
- The range of applicable SEPPs have been considered;
- Strategic documents that apply to the locality and wider region have identified that the proposed use is consistent with the strategic context of the area;

- The proposed development can satisfy the relevant provisions of the Building Code of Australia (BCA) and applicable Australian Standards.

Refer to **PART D** of this EIS.

PUBLIC NOTIFICATION AND CONSULTATION

A range of authorities have been consulted with during the preparation of this EIS. These include:

- City of Ryde Council
- Environment Protection Authority
- NSW DPIE's Environment, Energy and Science Group (EES)
- NSW DPIE's Water Group
- Transport for NSW (TfNSW)
- Ausgrid
- Sydney Water
- Heritage NSW
- Metropolitan Local Aboriginal Land Council
- surrounding local landowners, business and stakeholders
- any other public transport, utilities or community service providers.

The consultation process is detailed in **PART E** and **Appendix 5**.

ENVIRONMENTAL IMPACT ASSESSMENT

An assessment of environmental impact has been undertaken against the relevant planning controls and policies. Additionally, a number of expert consultants have been engaged to specifically consider relevant aspects of the proposal. The environmental impact assessment has found that the proposed development complies with the relevant controls and it is considered that appropriate mitigation measures can be put in place to minimise any identified risks.

The proposed development is considered acceptable in a legislative sense.

JUSTIFICATION FOR THE PROPOSED DEVELOPMENT

Thorough consideration of the environmental impacts of the proposal has been undertaken in the environmental impact assessment process and in the preparation of the EIS. In assessing the impacts of the proposed development, consideration has been given to social, economic and environmental matters. As identified in this EIS, proposed development is not considered to represent an environmental risk, or a development that might be out of context with the surrounding locality.

EIS FINDINGS

The findings of this EIS demonstrate that the proposed development can proceed with consent. All assessed impacts have been examined and deemed acceptable, in relation to all the relevant legislative requirements applicable to the subject site. Furthermore, the proposed data centre aligns with the objectives of the *A Metropolis of Three Cities – Greater Sydney Region Plan,* the *North District Plan* and the RLEP2014.

Based on the findings of this EIS, the subject site can successfully support the proposed data centre expansion, inclusive of related development, with acceptable environmental impacts. The proposed development is a logical continuation of the existing site operations. The proposal is deemed to result in significant operational efficiencies for the MDC entity.

The proposed development is deemed suitable for its intended purpose, having regard to its regional and local context and would not result in any significant environmental impacts. As such, it is requested that the proposed development be approved, subject to reasonable and relevant conditions.

PART A PRELIMINARY

1.1 INTRODUCTION

This EIS has been prepared by Willowtree Planning, on behalf of MDC. The EIS is submitted to the NSW DPIE, in support of an application for SSD, for the construction and operation of a data centre, involving site preparation works, provision of infrastructure and construction of an expansion of an existing data centre at 17 – 23 Talavera Road, Macquarie Park, more formally described as Lot 527 DP 752035.

The proposed development consists of an extension to the existing data centre, approved under LDA2018/0322, to allow for additional data storage capacity in response to increasing demand.

The proposal seeks to operate 24 hours per day, seven (7) days per week, and would generate approximately 1,200 construction jobs for the new purpose-built data centre and a total of approximately 49 operational jobs for the consolidated facility.

The particulars of this proposal are summarised below:

- Minor earthworks involving cut and fill works;
- Infrastructure comprising civil works and utilities servicing;
- Removal of 55 trees, retention of 39 trees (within the site), and planting of 47 new trees;
- Construction of a five (5) storey building extension, comprising up to:
  - An additional 9,097 m^2 of GFA
  - 14 data halls
- Increase in total data centre capacity by an additional 33 MW;
- Increase in the diesel storage capacity by an additional 418,000 L;
- Additional 18 backup generators;
- Additional set of dual 33kV feeder;
- 71 On site car parking spaces;
- Complementary landscaping (2,732 m^2);
- Hours of operation being on a 24 hours per day, 7 days per week, basis.

This EIS describes the subject site and proposed development. It also responds to the SEARs and assesses the proposed development in terms of all relevant matters set out in legislation, EPIs and associated planning policies.

The structure of this EIS is as follows:

- **PART A Preliminary**
- **PART B Site Analysis**
- **PART C Proposed Development**
- **PART D Legislative and Policy Framework**
- **PART E Consultation**
- **PART F Environmental Risk Assessment**
- **PART G Planned Management and Mitigation Measures**
- **PART H Proposed Development Justification**
- **PART I Conclusion**

1.2 SUPPORTING PROJECT DOCUMENTATION

Documents provided in support of the proposal are outlined in **TABLE 2**.

TABLE 2: DOCUMENT SCHEDULE

Appendix No.	Documentation	Consultant
Appendix 1	SEARs	-
Appendix 2	Quantity Surveyors Report	Linesight
Appendix 3	Title Documents	Various
Appendix 4	Survey Plan	Veris

TABLE 2: DOCUMENT SCHEDULE		
Appendix No.	**Documentation**	**Consultant**
Appendix 5	Community and Stakeholder Engagement Report	Astrolabe Group
Appendix 8	Plan of Operational Management	Macquarie Data Centres
Appendix 10	Architectural Plans	HDR
Appendix 14	Architectural Design Report	HDR
Appendix 28	Landscape Plan	Geoscapes Landscape Architecture
Appendix 30	Arborist Report	Urban Arbor
Appendix 31	BCA Assessment	MBC Group
Appendix 12	Access Report	ABE Consulting
Appendix 13	Civil Engineering Plans	Northrop Consulting Engineers
Appendix 14	Noise and Vibration Assessment	Renzo Tonin & Associates
Appendix 15	Air Quality and Odour Risk Assessment	SLR Consulting Australia
Appendix 16	Transport Impact Assessment	The Transport Planning Partnership
Appendix 17	Preliminary Construction Traffic Management Plan	The Transport Planning Partnership
Appendix 18	SEPP 33 Report	SLR Consulting
Appendix 19	Fire Safety Strategy Report	Innova Fire Safety Specialists
Appendix 20	Infrastructure Report	HDR
Appendix 21	Drainage Easement Options	Northrop Consulting Engineers
Appendix 22	Detailed Site Investigation Report	ERM Services Australia
Appendix 23	Geotechnical Investigation	JK Geotechnics
Appendix 24	Civil Engineering Report	Northrop Consulting Engineers
Appendix 25	Stormwater Assessment Report	Northrop Consulting Engineers
Appendix 26	Flood Assessment Report	Northrop Consulting Engineers
Appendix 27	Visual Impact Assessment Report	Geoscapes Landscape Architecture
Appendix 28	Energy Efficiency and Greenhouse Gas Assessment	HDR
Appendix 29	BDAR Wavier	-
Appendix 32	Draft Aboriginal Cultural Heritage Assessment Report	Artefact Heritage
Appendix 33	Non Aboriginal Heritage Report	Artefact Heritage
Appendix 32	Social Impact Assessment	Astrolabe Group
Appendix 33	Waste Management Plan	SLR Consulting
Whole document	Environmental Impact Statement	Willowtree Planning

1.3 CAPITAL INVESTMENT VALUE

The CIV of the proposed development in accordance with the CIV definition under the *Environmental Planning & Assessment Regulation 2000* (EP&A Regulation), is estimated to be $289,731,682.00.

A Quantity Surveyors (QS) Costings Report, prepared by Linesight, is included in **Appendix 2**.

1.4 THE PROPONENT

See **TABLE 3** below for contact details.

TABLE 3: PROPONENT CONTACT DETAILS	
Company Details	Macquarie Data Centres
Contact Name	Paul Christensen
Position	General Manager – Data Centres
Contact Number	(02) 8221 7572
Email Address	pchristensen@macquariedatacentres.com

1.5 SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

An application requesting SEARs was submitted to the DPIE (reference: SSD-24299707). The SEARs were subsequently issued by NSW DPIE on the 12 August 2021 and are addressed by this EIS.

For reference, the full SEARs, as issued, are annexed in **Appendix 1** of this EIS. An overview of how the SEARs have been satisfied are outlined in **TABLE 4** below. This EIS is also consistent with the minimum requirements for an EIS, as set out in Clauses 6 and 7 of Schedule 2 of the EP&A Regulation.

TABLE 4: HOW THE SEARS HAVE BEEN SATISFIED	
Requirements	**Satisfied by**
General Requirements	
The Environmental Impact Statement (EIS) must be prepared in accordance with, and meet the minimum requirements of clauses 6 and 7 of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 (the Regulation).	Refer to **Section 4.3.2** of this EIS.
The EIS must include:	
▪ a detailed description of the development, including: - an accurate history of the site, including development consents - the need and justification for the proposed development - alternatives considered including a description of feasible options within the development which may include a layout options analysis - likely staging of the development - likely interactions between the development and existing, approved and proposed operations on the site (including LDA2018/0322 and LDA2010/0671) and in the vicinity of the site - plans of any proposed building works - contributions required to offset the proposal - infrastructure upgrades or items required to facilitate the development, including measures to ensure these upgrades are appropriately maintained.	Refer to **PART C** and **PART H** of this EIS.
▪ consideration of all relevant environmental planning instruments, including identification and justification of any inconsistences with these instruments	Refer to **PART D** of this EIS.
▪ consideration of issues discussed in the public authority responses to request for key issues	Refer to **PART E** of this EIS.
▪ a risk assessment of the potential environmental impacts of the development, identifying the key issues for further assessment	Refer to **PART F** of this EIS.

▪ a detailed assessment of the key issues specified below, and any other significant issues identified in this risk assessment, which includes: - a description of the existing environment, using sufficient baseline data - an assessment of the potential impacts of all stages of the development, including any cumulative impacts, taking into consideration relevant guidelines, policies, plans and statutes and - a description of the measures that would be implemented to avoid, minimise, mitigate and if necessary, offset the potential impacts of the development, including proposals for adaptive management and/ or contingency plans to manage significant risks to the environment	Refer to **PART F** and **PART G** of this EIS.
▪ a consolidated summary of all the proposed environmental management and monitoring measures, highlighting commitments included in the EIS.	Refer to **PART G** of this EIS.
The EIS must also be accompanied by:	
▪ high quality files of maps and figures of the subject site and proposal	**Whole document**
▪ a report from a qualified quantity surveyor providing a detailed calculation of the capital investment value (CIV) of the proposal (as defined in clause 3 of the Regulation), including details of all assumptions and components from which the CIV calculation is derived. The report must: – at a minimum, include warm shell fit-out of the entire development and a detailed breakdown of plant costs – be prepared on company letterhead – indicate the applicable GST component of the CIV	Refer to **Section 1.3** and **Appendix 2** of this EIS.
– an estimate of jobs that will be created during the construction and operational phases of the proposed development (including details of the methodology used to determine the figures provided)	Refer to **Section 3.2** and **Appendix 32** of this EIS.
– certification that the information provided is accurate at the date of preparation.	Refer to **Appendix 2** of this EIS.
Key Issues	
The EIS must include an assessment of the potential impacts of the proposal (including cumulative impacts) and develop appropriate measures to avoid, mitigate, manage and/or offset these impacts.	Refer to **PART F** of this EIS.
The EIS must address the following specific matters:	
1. Statutory and strategic context	
▪ justification for the proposal and the suitability of the site	Refer to **Section 6.1.2** of this EIS.
▪ detailed justification that the proposed land use is permissible with consent	Refer to **Section 4.3.7** and **Section 6.1.2** of this EIS.
▪ a detailed description of the history of the site, including the relationship between the proposed development and LDA2018/0322, LDA2010/0671, and all other development consents and approved plans previously and/or currently applicable to the site	Refer to **PART B** of this EIS.
▪ demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, adopted precinct plans, draft district plan(s)	Refer to **PART D** of this EIS.

and adopted management plans and justification for any inconsistencies. This includes, but is not limited to: - State Environmental Planning Policy (Infrastructure) 2007 - State Environmental Planning Policy (State and Regional Development) 2011 - State Environmental Planning Policy No. 33 – Hazardous and Offensive Development - State Environmental Planning Policy No. 55 – Remediation of Land - Penrith Local Environmental Plan 2010 - Greater Sydney Region Plan: A Metropolis of Three Cities - Our Greater Sydney 2056: North District Plan - Future Transport Strategy 2056	
2. Suitability of the site	
▪ detailed justification that the site can accommodate the proposed development having regard to the scope of the operations of the existing facility and its environmental impacts and relevant mitigation measures	Refer to **Section 6.1.2** of this EIS.
▪ an analysis of site constraints	Refer to **Section 2.6** of this EIS.
3. Community and stakeholder engagement	
▪ a community and stakeholder participation strategy identifying key community members and other stakeholders, including: - details and justification for the proposed consultation approach(s) - clear evidence of how each stakeholder identified in the community and stakeholder participation strategy has been consulted - issues raised by the community and surrounding landowners and occupiers - clear details of how issues raised during consultation have been addressed and whether they have resulted in changes to the development - details of consultation regarding the design of the development and its relationship to existing on-site stormwater infrastructure and easements, including evidence of consultation with City of Ryde Council (Council) - details of the proposed approach to future community and stakeholder engagement based on the results of consultation.	Refer to **PART E**, **Section 6.1.3** and **Appendix 5** of this EIS.
4. Back-up power system	
▪ detailed justification for the chosen back-up power system, including: - a comprehensive assessment of alternative, commercially available technologies (solar power/large-scale batteries, hydrogen cells, etc) - demonstration of a commitment to continual improvement with respect to the design of the back-up power system and its associated emissions	Refer to **Section 6.1.4** of this EIS.
▪ a detailed overview of the proposed back-up generator system (if chosen), including: - number and individual capacity of each generator (in terms of megawatts and megajoules per second)	Refer to **Section 6.1.4** of this EIS.

- maximum operating time during a power outage event - testing procedure (including whether testing will be carried out individually or in clusters), frequency and duration (including confirmation and, if necessary, justification of the need to test during the evening or night-time period).	
5. Noise and vibration	
▪ a quantitative noise and vibration impact assessment undertaken by a suitably qualified acoustic consultant in accordance with the relevant Environment Protection Authority guidelines and Australian Standards which includes: - the identification of impacts associated with construction, site emissions and traffic generation at noise affected sensitive receivers (including consideration of cumulative impacts from the existing data centre and surrounding developments), including the provision of operational noise contours and a detailed sleep disturbance assessment - details of noise monitoring survey, background noise levels, noise source inventory and 'worst case' noise emission scenarios - consideration of annoying characteristics of noise and prevailing meteorological conditions in the study area - adequate modelling of site operational noise and vibration sources such as cooling system fans and motors in proposed locations, energy back-up systems such as generator engines, and vehicle access, traverse, and manoeuvring paths - details and analysis of the effectiveness of proposed management and mitigation measures to adequately manage identified impacts, including a clear identification of residual noise and vibration following application of mitigation these measures and details of any proposed compliance monitoring programs.	Refer to **Section 6.1.4** and **Appendix 14** of this EIS.
6. Air quality	
▪ a quantitative assessment of the potential air quality, dust and odour impacts of the development, during construction and operation, in accordance with relevant Environment Protection Authority guidelines	Refer to **Section 6.1.6** and **Appendix 15** of this EIS.
▪ The assessment must include: - scenarios for construction works, operations, and testing of the back-up power system or its considered alternatives and a justified worst-case scenario - assessment of emissions from the back-up power system against the standards of concentration outlined in the Protection of the Environment Operations (Clean Air) Regulation 2010 (including, but not limited to, polycyclic aromatic hydrocarbons (PAHs) and oxides of nitrogen (NOx) impacts) - assessment of criteria pollutants in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA, 2016)	Refer to **Section 6.1.6** and **Appendix 15** of this EIS.
▪ details of proposed mitigation, management and monitoring measures (including for the back-up power system) required to ensure compliance with section 128 of the Protection of the Environment Operations Act 1997	Refer to **Section 6.1.6** and **Appendix 15** of this EIS.
7. Traffic and transport	

▪ details of all traffic types and volumes likely to be generated during construction and operation of the development (light and heavy vehicles, public transport, pedestrian and cycle trips), including maps depicting the key access routes for each transport mode	Refer to **Section 6.1.7** and **Appendix 16** of this EIS.
▪ an assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including consideration of cumulative traffic impacts at key intersections (Lane Cove Road/ Talavera Road and Talavera Road/ Khartoum Road intersections) using SIDRA or similar traffic model	Refer to **Section 6.1.7** and **Appendix 16** of this EIS.
▪ details of the number of proposed car parking spaces and compliance with the appropriate parking standards/guidelines	Refer to **Section 6.1.7** and **Appendix 16** of this EIS.
▪ detailed plans of the internal road network, loading dock arrangements and proposed pedestrian and cyclist facilities (including end of trip facilities), in accordance with relevant Australian Standards	Refer to **Section 6.1.7** and **Appendix 16** of this EIS.
▪ details of any existing or proposed access points for the development, including any interactions with existing operations	Refer to **Section 6.1.7** and **Appendix 16** of this EIS.
▪ details of the largest vehicle anticipated to access and move within the site, including swept path analysis	Refer to **Section 6.1.7** and **Appendix 16** of this EIS.
▪ details of the proposed traffic mitigation, management and monitoring measures, including draft versions of any associated management plans.	Refer to **Section 6.1.7** and **Appendix 16** and **Appendix 17**of this EIS.
8. Hazards and risk	
▪ a preliminary risk screening completed in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development and Applying SEPP 33 (DoP, 2011), with a clear indication of class (and any subsidiary hazard), quantity and location of all dangerous goods and hazardous materials associated with the development. Should preliminary screening indicate that the development is "potentially hazardous" a Preliminary Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 – Hazard Analysis (DoP, 2011) and Multi-Level Risk Assessment (DoP, 2011)	Refer to **Section 4.3.8** and **Appendix 18** of this EIS.
▪ details regarding the location and number of any back-up generators, back-up fuel storage tanks and lithium-ion or other battery chemistries (with details of peak discharge rate in MW) to be installed to service the development. For batteries and diesel storage, the EIS must also demonstrate the development would comply with the following standards: - AS/NZS 4681 - Storage and handling of Class 9 (miscellaneous) dangerous goods and articles - AS IEC 62619 - Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and batteries, for use in industrial applications - FM Global Property Loss Prevention Data Sheet 05-32 - Data Centres and Related Facilities - AS 1940 - Storage and handling of flammable and combustible liquids.	Refer to **Section 4.3.8** and **Appendix 18** and **Appendix 19** of this EIS.
9. Infrastructure requirements	

▪ in consultation with relevant service providers: - an assessment of the impacts of the development on existing utility infrastructure and service provider assets surrounding the site o identification of any infrastructure upgrades required on-site and off-site to facilitate the development and any arrangements to ensure that the upgrades will be implemented on time and be maintained - development of an infrastructure delivery and staging plan, including a description of how infrastructure requirements would be co-ordinated, funded and delivered to facilitate the development	Refer to **Section 6.1.9** and **Appendix 20** of this EIS.
▪ in consultation with Council: - a detailed description of all existing easements and/or stormwater infrastructure affecting the site - an assessment of the impacts of the development upon Council's existing and proposed on-site stormwater infrastructure, including a detailed description of how the development has been designed to avoid and/or minimise potential impacts.	Refer to **Section 6.1.9** and **Appendix 21** of this EIS.
10. Soils and water	
▪ an assessment of potential surface and groundwater impacts associated with the development, including potential impacts on nearby watercourses, riparian areas, groundwater, and groundwater-dependent communities	Refer to **Section 6.1.10** of this EIS.
▪ a detailed overview of the development's anticipated water usage and intended water supply arrangements	Refer to **Section 6.1.10** and **Appendix 28** of this EIS.
▪ details of all existing and proposed surface, stormwater and wastewater management systems (including on-site detention and/or reuse), and an assessment of any associated water quality treatment options	Refer to **Section 6.1.10** and **Appendix 25** of this EIS.
▪ a description of the proposed measures to minimise water use and promote water sensitive urban design (WSUD)	Refer to **Section 6.1.10** and Error! R eference source not found. of this EIS.
▪ a topographic assessment and justification demonstrating that any proposed earthworks are responsive and contextually appropriate	Refer to **Section 6.1.10** and **Appendix 24** of this EIS.
▪ characterisation of the nature and extent of any contamination on the site and surrounding area	Refer to **Section 6.1.10** and **Appendix 22** of this EIS.
▪ a description of the proposed erosion and sediment controls during construction.	Refer to **Section 6.1.10** and **Appendix 24** of this EIS.
11. Flood risk	
▪ identification of any flood risk on-site having regard to adopted flood studies, the potential effects of climate change, and any relevant provisions of the NSW Floodplain Development Manual (DIPNR, 2005)	Refer to **Section 6.1.11** and **Appendix 26** of this EIS.
▪ an assessment of the impacts of the development, including any changes to flood risk on-site or off-site (including the existing overland flow route), and detail design solutions and operational procedures to mitigate flood risk where required.	Refer to **Section 6.1.11** and **Appendix 26** of this EIS.
12. Urban design and visual	
▪ demonstration of how the development will achieve design excellence in accordance with any relevant EPI provisions and the objectives for good design in Better Placed (GANSW, 2017)	Refer to **Section 6.1.8** and **Appendix 8** of this EIS.

▪ a detailed design analysis of the proposed development with reference to the building form, height, setbacks, bulk and scale in the context of the immediate locality, the wider area and the desired future character of the area, including views, vistas, open space and the public domain	Refer to **Section 6.1.8** and **Appendix 14** of this EIS.
▪ a visual analysis of the development from key viewpoints, including photomontages or perspectives showing the proposed development	Refer to **Section 6.1.8** and **Appendix 27** of this EIS.
▪ where the visual analysis has identified the potential for significant visual impact, preparation of a visual impact assessment that addresses the impacts of the development on the existing catchment	Refer to **Section 6.1.8** and **Appendix 27** of this EIS.
▪ consideration of the layout and design of the development having regard to the surrounding vehicular, pedestrian and cycling networks (both existing and proposed)	Refer to **Appendix 5** and **Appendix 16** of this EIS.
▪ an assessment of the solar orientation of the development and any potential overshadowing (this should be supported by shadow diagrams for all four seasons)	Refer to **Section 6.1.8** and **Appendix 7** of this EIS.
▪ detailed plans showing suitable landscaping which incorporates endemic species	Refer to **Section 6.1.8** and **Appendix 9** of this EIS.
▪ consideration of how the development would maximise opportunities for green infrastructure, consistent with Greener Places (GANSW, 2020)	Refer to **Section 6.1.8** and **Appendix 9** of this EIS.
▪ an assessment of how the development complies with relevant accessibility requirements.	Refer to **Section 6.1.8** and **Appendix 12** of this EIS.
13. Ecologically sustainable development	
▪ a description of how the proposal will incorporate the principles of ecologically sustainable development in the design, construction and ongoing operation of the development	Refer to **Section 6.1.13** and **Appendix 28** of this EIS.
▪ consideration of the use of green walls, green roofs and/or cool roofs in the design of the development	Refer to **Section 6.1.13** and Appendix 28 of this EIS.
▪ a description of the measures to be implemented to minimise consumption of resources, especially energy and water.	Refer to **Section 6.1.13** and Error! Reference source not found. of this EIS.
14. Greenhouse gas and energy efficiencies	
▪ an assessment of the energy use of the proposal and all reasonable and feasible measures that would be implemented on site to minimise the proposal's greenhouse gas emissions (reflecting the Government's goal of net zero emissions by 2050).	Refer to **Section 6.1.14** and Error! Reference source not found. of this EIS.
15. Biodiversity	
▪ an assessment of the proposal's biodiversity impacts in accordance with the Biodiversity Conservation Act 2016, including the preparation of a Biodiversity Development Assessment Report (BDAR) where required under the Act, except where a waiver for preparation of a BDAR has been granted.	Refer to **Section 6.1.15** and **Appendix 29** of this EIS.
16. Aboriginal cultural heritage	
▪ an Aboriginal Cultural Heritage Assessment Report prepared in accordance with relevant guidelines, identifying, describing and assessing any impacts for any Aboriginal cultural heritage values on the site.	Refer to **Section 6.1.16** and **Appendix 30** of this EIS.

17. Non-Aboriginal cultural heritage	
▪ Assessment Report prepared in accordance with relevant guidelines, identifying, describing and assessing any impacts for any Aboriginal cultural heritage values on the site.	Refer to **Section 6.1.17** and **Appendix 31** of this EIS.
18. Socio-economic	
▪ an analysis of any potential economic impacts of the development, including a discussion of any potential economic benefits to the local and broader community	Refer to **Section 6.1.18** and **Appendix 32** of this EIS.
19. Waste	
▪ details of the quantities and classification of all waste streams to be generated on site during the development	Refer to **Section 6.1.14** and **Appendix 33** of this EIS.
▪ details of waste storage, handling and disposal during the development	Refer to **Section 6.1.14** and **Appendix 33** of this EIS.
▪ details of the measures that would be implemented to ensure that the development is consistent with the aims, objectives and guidance in the NSW Waste Avoidance and Resource Recovery Strategy 2014-2021	Refer to **Section 6.1.14** and **Appendix 33** of this EIS.
20.Planning agreement/development contributions	
▪ demonstration that satisfactory arrangements have been or would be made to provide, or contribute to the provision of, necessary local and regional infrastructure required to support the development	Refer to **Section 6.1.20** of this EIS.
Consultation	
During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners.	Refer to **PART E** and **Appendix 5** of this EIS.
In particular you must consult with: ▪ City of Ryde Council ▪ Environment Protection Authority ▪ Department's Environment, Energy and Science Group ▪ Department's Water Group ▪ Transport for NSW ▪ Ausgrid ▪ Sydney Water ▪ Heritage NSW ▪ Metropolitan Local Aboriginal Land Council ▪ surrounding local landowners, businesses and stakeholders ▪ any other public transport, utilities or community service providers	Refer to **PART E** and **Appendix 5** of this EIS.
The EIS must describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.	Refer to **PART E** and **Appendix 5** of this EIS.

PART B SITE ANALYSIS

2.1 SITE LOCATION & EXISTING SITE CHARACTERISTICS

The identified portion of land, that is the subject of this EIS is defined 17 – 23 Talavera Road, Macquarie Park, being Lot 527 DP 752035.

The subject site comprises a total area of approximately 20,094 m^2.

The subject site forms part of the Macquarie Park Corridor, which is earmarked for innovation and collaboration with a strong employment focus. The strategic intent for the Macquarie Park Corridor is to transition from a successful suburban business park to a vibrant commercial centre that supports job growth and creates a great place for people to share ideas, live and play.

In its existing state, the subject site contains the newly constructed data centre extension (stage 1), sitting at five (5) storeys high, with a total power consumption capacity up to 28 MW. The development history of the subject site is further described in **Section 2.2** of this EIS.

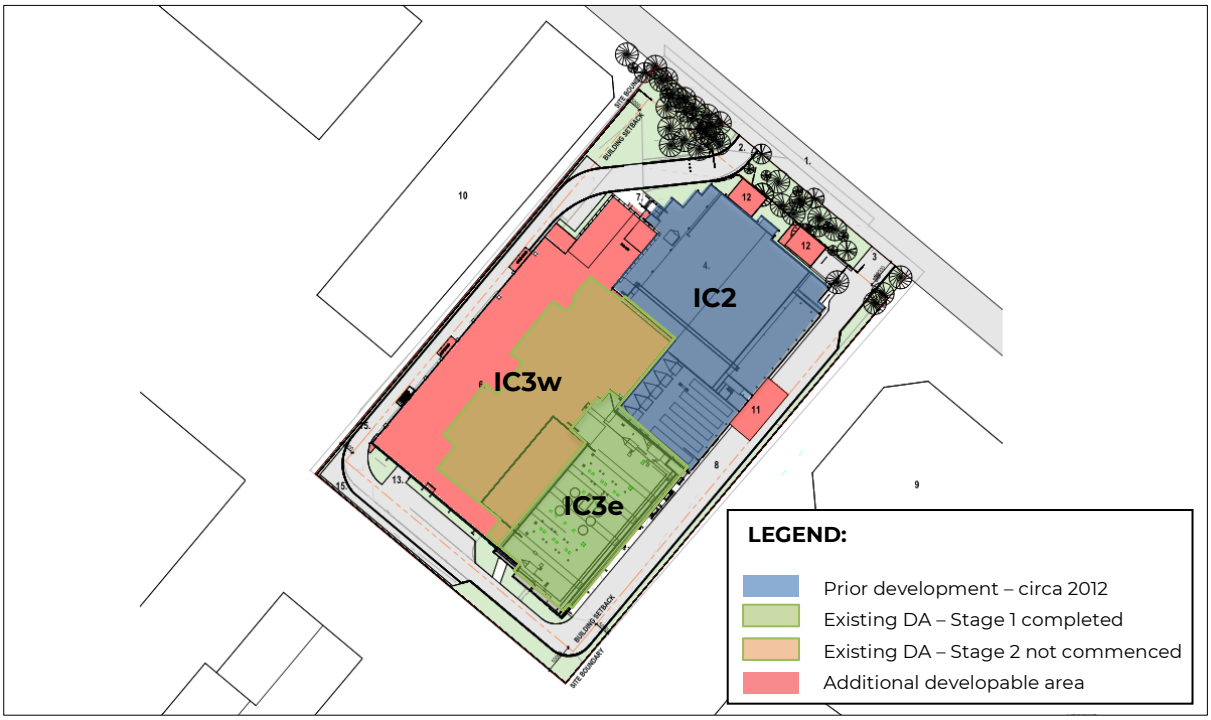


Figure 2 Site Evaluation (Source: HDR, 2021)

Access to the subject site is currently obtained via Talavera Road, along the north-eastern boundary of the subject site.

The subject site is situated approximately 12.5 km north-west of the Sydney CBD and 11.3 km north-east of Parramatta. The site is within close proximity to transport infrastructure routes (predominantly the bus and rail networks), as well as sharing direct links with the wider regional road network, including Talavera Road, Lane Cove Road, Epping Road and the M2 Motorway. These road networks provide enhanced connectivity to the subject site and wider locality. Additionally, the subject site is located within close proximity to active transport links, such as bicycle routes, providing an additional mode of accessible transport available to site users.

The subject site's historical context is best described through its currently commercial setting, as an existing Data Centre, adjoining surrounding commercial premises along Talavera Road, forming part of the wider Macquarie Park Corridor. Land surrounding the subject site comprises the following land use zoning, including:

- B7 Business Park
- B3 Commercial Core

- B4 Mixed Use
- SP2 Infrastructure

An overview of the site characteristics are included in **TABLE 5**, as follows.

TABLE 5: SITE CHARACTERISTICS	
Component	**Description**
Address and legal description	17 – 23 Talavera Road, Macquarie Park Lot 527 DP 752035
Site area	20,094m^2 (approx.)
Current use	The use of the subject site consists of an existing Data Centre.
Topography	The surface of the site is generally flat, sitting at elevations between 49m and 54m Australian Height Datum (AHD), and exhibiting a minor gradient down towards its northern corner.
Access	Vehicular access to the subject site is via Talavera Road – the subject site benefits from two (2) vehicular crossovers to Talavera Road.
Vegetation	The subject site is predominantly an artificial landscape with planted trees in rows situated along the perimeter of the subject site as well as landscaped areas adjacent to the existing Data Centre.
Watercourses	The nearest mapped watercourse is Shrimptons Creek, which is located approximately 630m to the west of the subject site, and flows in a north/north-easterly direction, ultimately discharging to the Lane Cover River.
Easements and encumbrances	The subject site is burdened by a number of easements and encumbrances, pertaining to various infrastructure services, including water, sewerage and electricity. Further details are included in **Section 2.4** of this EIS.
Heritage	The subject site is not identified as containing an item of heritage or being within a heritage conservation area.

The location of the subject site and existing site development are depicted in **Figure 4** and **Figure 5**.

2.2 DEVELOPMENT HISTORY

Other development approvals that relate to the subject site are identified below.

LDA2010/0671 – data centre and research/development facility

- On 29 April 2011, deferred commencement approval was granted by the Joint Regional Planning Panel, for alterations and additions to an existing building and change of use of the premises to a data centre and research and development facility.

LDA2016/0587 – data centre internal alterations

- On 30 January 2017, development consent was granted for internal alterations to the plant room at the data centre level 1 and construction of a new plant room on rooftop.

LDA2016/0588 – data centre alterations

- On 30 January 2017, development consent was granted for the conversion of existing plant room to a data storage room.

LDA2018/0322 – data centre alterations and additions

- On 20 September 2019, development consent was granted by the Land and Environment Council (LEC) of NSW, by way of a Section 34 agreement, for alterations and additions to an existing data centre, including a new six (6) storey addition to the rear and an additional 23 on grade car parking spaces.

- Stage 1 of the development consent has been completed, while Stage 2 has not commenced. The intent of this development application (SSD-24299707) is to complete a further expansion of the constructed data centre, which would encapsulate the abovementioned Stage 2 works, plus additional built form.

The current site development context is depicted in **Figure 3**.

Figure 3 Site Development History (Source: Nearmap, 2021)

Noting the general extent of this proposal and the previous LEC approval (LDA2018/0322), the relevant conditions of consent are identified below in **TABLE 6**, as they relate to this SSD Application.

TABLE 6: PREVIOUS DEVELOPMENT CONSENT (LDA2018/0322) REVIEW		
Condition No.	**Condition Description**	**Response for proposed SSD**
Part 1 – Deferred Commencement		
(A) 1	*Voluntary Planning Agreement. The Planning Agreement between The Council of the City of Ryde and Macquarie Telecom Pty Limited in the terms set out via offer on 8 October 2018 and placed on public exhibition between approximately 23 January 2019 and 26 February being entered into with Council.*	This VPA has been executed. Any new VPA for the subject SSD would seek to obtain a credit where there have already been monies paid relevant to the proposal (i.e. Stage 2).
(A) 8	*Variation of Council's Easement. The terms of the existing 3.5m wide public drainage traversing the property is to be amended to include a right in favour of Council for relation of the easement.* *The amended terms are to include an option for an easement in favour of Council to be created over the proposed alignment of the future 2100mm diameter trunk drainage pipeline, or equivalent, and*	Refer to **Section 6.1.9.2** of this EIS for further detail in relation to this easement requirement.

TABLE 6: PREVIOUS DEVELOPMENT CONSENT (LDA2018/0322) REVIEW		
Condition No.	**Condition Description**	**Response for proposed SSD**
	associated pits traversing the site generally in accordance with Civil Engineering Design Package – Trunk Drainage Works (Job Number: 170095, Revision 01) prepared by Northrop. The easement shall be centrally located over the future 2100mm diameter pipeline, or equivalent. *The minimum total easement width shall be 4.0m wide at all locations. A plan of the proposed new location of the easement must be registered at NSW Land Registry at the same time as the variation, as a plan of proposed easement.* *A Variation of Easement shall be registered over the existing 1800 mm trunk drainage pipeline with provision for the new easement to be made operational once the future 2100 mm diameter pipeline is constructed. The Variation of Easement shall include provision of a Construction Licence to facilitate construction of the future 2100 mm pipeline including storage of goods within the site boundary and access by plant machinery.*	
Part 2 – Conditions of Consent		
21	*Tree Retention. The following trees as identified within Arboricultural Impact Assessment prepared by Arboreport dated 11 May 2018 must be retained and protected: Tree 1, 1a, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97 & 98.*	The following trees identified within Arboricultural Impact Assessment, prepared by Urban Arbor, dated 20 October 2021, will be retained and protected: Tree 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 31, 67, 87, 88, 89, 90, 96, 98, 101, 103, 105, 106, 107, 109, 110, 112, 113, 114, 116, 117, 118, 120, 122, 123 and 124.
98	*Restriction as to User – Undercroft. A restriction as to user is to be placed on the property title to prevent the closure of openings or storage of any materials other than as shown and modeled on the DA approved drawings within undercroft areas which are intended to accommodate the conveyance of overland flows that may occur during extreme storm events. The terms of the restriction shall be prepared to the satisfaction of Council and must be registered on the title of the property prior to the release of any Occupation Certificate.*	This condition can be retained and complied with.
99	*Positive Covenant(s) - Stormwater Management.* *A Positive Covenant must be created on the property title(s) pursuant to the relevant section of the Conveyancing Act (1919), providing for the ongoing maintenance of the onsite detention and WSUD components incorporated in the approved Stormwater Management system. This is to ensure that the drainage system will be maintained and operate as approved throughout the life of the development, by the owner of the site(s). The terms of*	This condition can be retained and complied with.

TABLE 6: PREVIOUS DEVELOPMENT CONSENT (LDA2018/0322) REVIEW		
Condition No.	**Condition Description**	**Response for proposed SSD**
	the instrument are to be in accordance with the Council's standard terms for such systems, as specified in City of Ryde DCP 2014 - Part 8.4 (Title Encumbrances) and to the satisfaction of Council. The positive covenant must be registered on the title prior to the release of any Occupation Certificate for development works for which the system(s) serve.	
100	*Positive Covenant - Access to easement. A positive covenant registered in accordance with Section 88 of the Conveyancing Act 1919 shall be placed on the property title, requiring the property owner to remove all structures spanning the easement up to a height of 10m above the finished surface level in the property at their cost, when requested to do so by Council or other service provider, in accordance with Council's DCP Part 8.4 (Title Encumbrances) Section 2.1.3. The terms of the restriction shall be generally in accordance with Council's draft terms for such measures*	This condition can be retained and complied with.

2.3 LAND OWNERSHIP

The land that is the subject of this application, is owned by ONE FUNDS MANAGEMENT LIMITED.

Land owners consent is to be provided prior to the determination of this development application.

2.4 EASEMENTS AND ENCUMBRANCES

The encumbrances noted within the Certificate of Title and Title Diagram (Crown Plan) for Lot 527 DP 752035 are summarised in **TABLE 7**, and a copy of the relevant documents included in **Appendix 3.**

TABLE 7: ENCUMBRANCES ON TITLE	
Reference	**Description and Location**
DP 633528 (A)	Easement to drain sewage – 4 wide and variable
DP 633528 (B)	Easement to drain sewage – 6.095 wide
DP 633528 (C)	Easement to drain water – 6.095 wide
DP 268249 (D)	Easement to drain water – 3.5 wide
DP 269393 (F)	Easement to drain water – 2.0 wide
DP 1196088 (R)	Restriction on the use of land
DP 633528 (G)	Restriction on the use of land
AH 147858	Positive covenant
AJ 543685 (Y)	Easement for electricity and other purposes
AJ 543686 (W)	Right of way lease
AJ 543686 (X)	Easement for electricity purposes
AJ 543686 (Z)	Substation premises lease

The proposed development has been designed in accordance with the abovementioned easements and encumbrances.

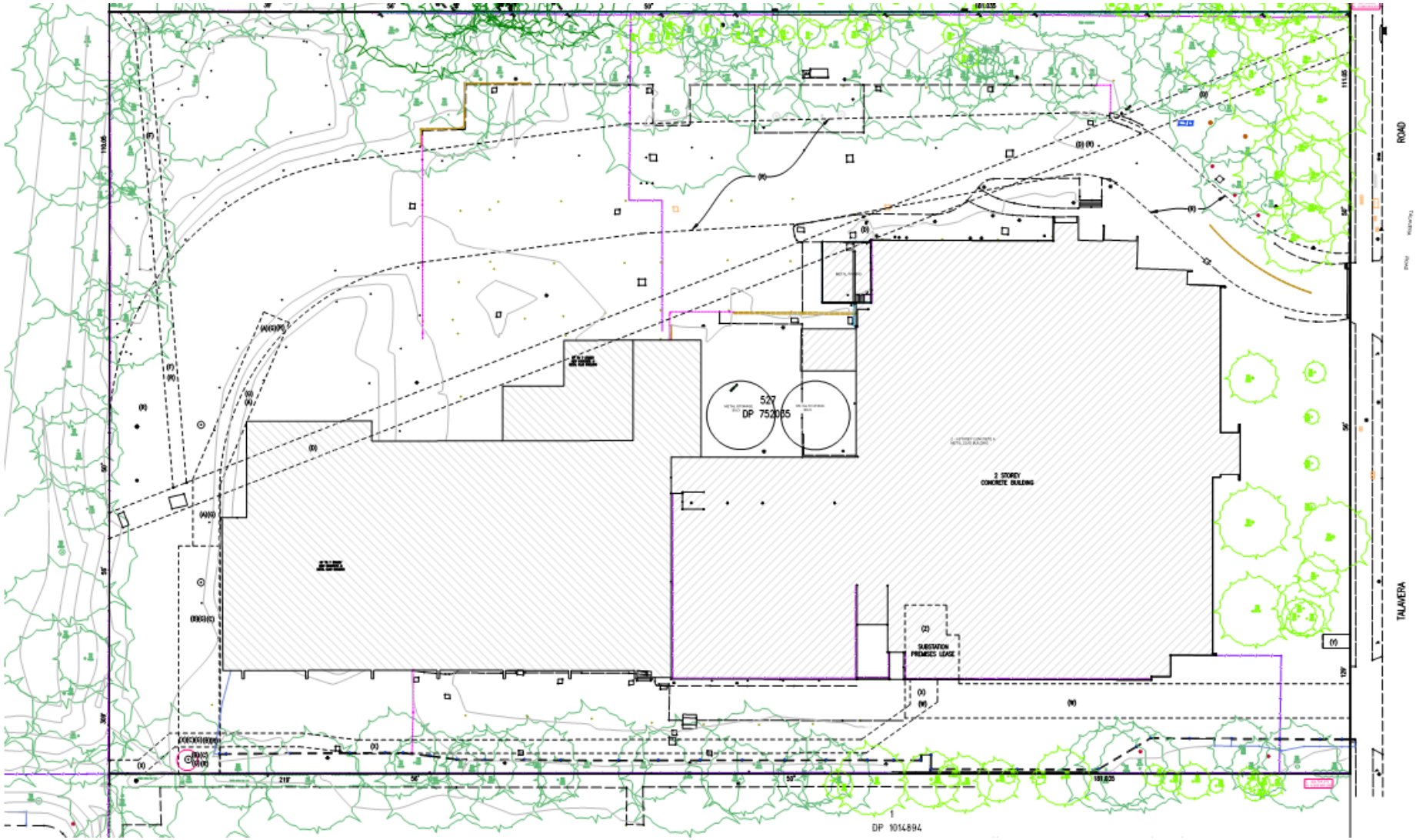


Figure 4 Survey Plan (Source: Veris Australia Pty Ltd, August 2021)

Figure 5 Aerial Map (Source: Nearmap, 2021)

2.5 SITE CONTEXT

The subject site is located within Macquarie Park, and forms part of the strategic centre of the Macquarie Park Corridor. The subject site is bound to the north-east by Talavera Road, which is accessible via Lane Cove Road (which connects directly to the M2 Motorway) and Khartoum Road. The Macquarie Park Corridor is already a key economic contributor for the wider catchment, with further strategic intent to evolve as a health and education precinct, together as an important economic and employment powerhouse for Sydney's North District.

The subject site is located within the B7 Business Park zone of the RLEP214, with the surrounding area constituting a mix of the following land use zoning:

- B7 Business Park
- B3 Commercial Core
- B4 Mixed Use
- SP2 Infrastructure

The wider Macquarie Park catchment is home to Macquarie University, Macquarie University Hospital, Macquarie University Incubator and more than 180 large international corporations and 200 small businesses. Leveraging its existing economic profile, Macquarie Park has the potential to be transformed into a diverse innovation and collaboration district.

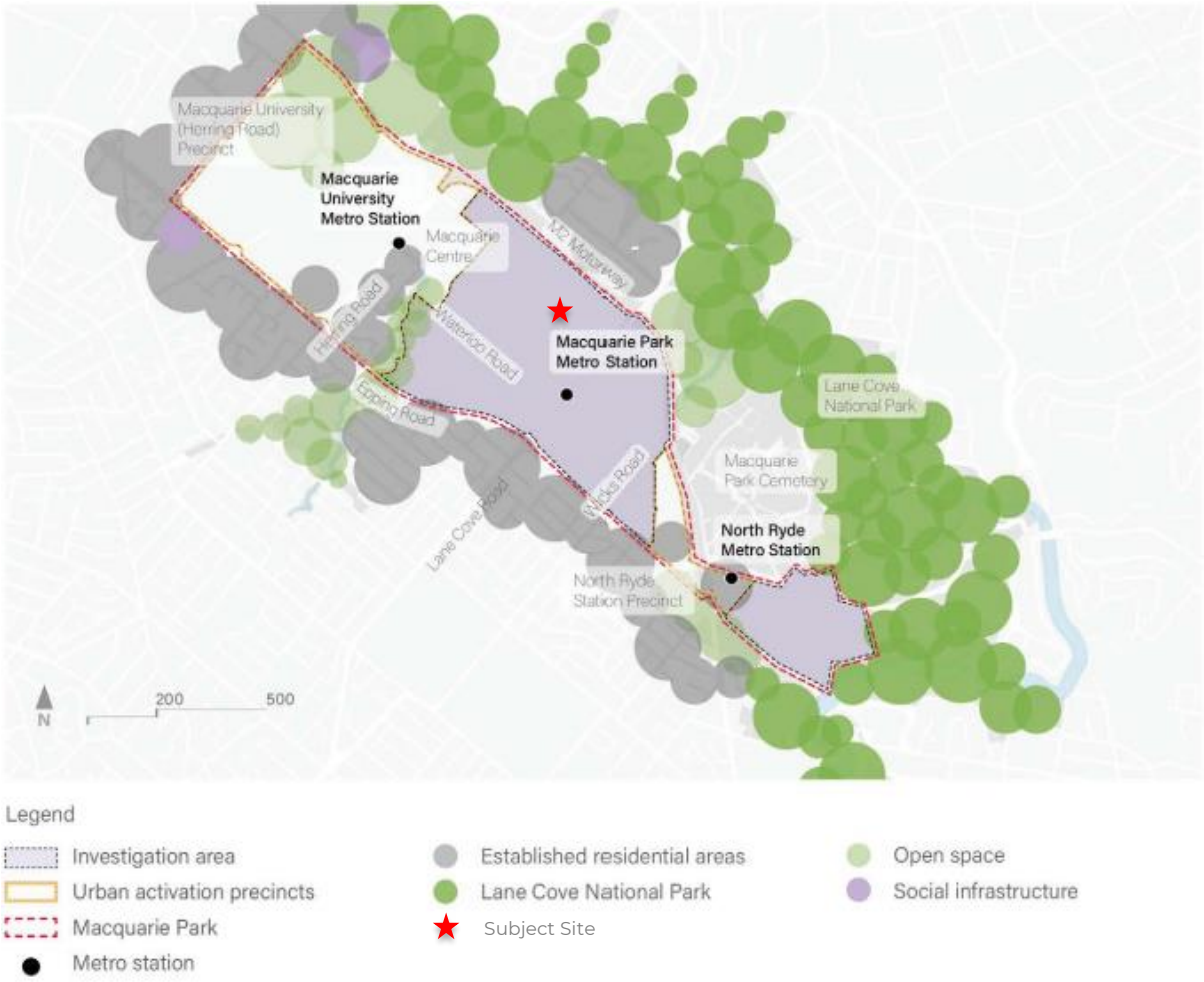


Figure 6 Macquarie Park Corridor (Source: NSW DPIE, 2021)

Land directly to the north of the subject site is zoned B7 Business Park, beyond which lies the M2 Motorway. The nearest residential receiver to the subject site is located further to the north, approximately 300m (beyond the M2 Motorway). To the east of the subject site is Lane Cove Road, which connects directly to the M2 motorway. The land uses within this area constitute a series of large commercial buildings up to and around six (6) storeys. Similarly, to the south of the subject site is evolving to a similar commercial scale, being zoned B3 Commercial Core. Directly to the west of the subject site, continues the commercial character of the area. Further past Khartoum Road is the Macquarie Centre shopping mall and the Macquarie University precinct.

Generally, the broader context of the subject site is typified by employment-generating land uses. The employment generating land uses. A visual representation of the surrounding land is included in **Figure 1**. **Figure 7** and **Figure 8** demonstrate the context of the current site conditions along Talavera Road.

Figure 7 **Street view looking north-west from Talavera Road towards subject site (Source: Google, 2020)**

Figure 8 **Street view looking north-west along Waterloo Road, south of the subject site (Source: Google, 2020)**

2.6 SITE SUITABILITY

The subject site is located within a transforming commercial precinct and is zoned B7 Business Park under RLEP2014. The proposed development would facilitate the continues use of the subject site for commercial purposes, which is consistent with the zoning and the surrounding context.

Development for the purpose of a data centre falls within the definition of 'storage premises' (used for the storage of data and related information technology hardware), which is permissible with consent in the B7 Business Park zone, pursuant to Part 3, Division 3, Clause 27 of ISEPP.

The subject site is suitable for the size and scale of the development proposed and represents a quality outcome to facilitate further data storage capabilities, in response to growing market demand.

In summary, the subject site is highly-suited to accommodate the intended development based on the following factors:

- ISEPP allows for the proposed development as a permissible use;
- The site is readily accessible via the regional road network;
- The proposed development is compatible with surrounding development and local context;
- The subject site can be serviced immediately and at no cost to Government;
- The proposed development causes minimal impact on the environment;
- The proposal will complement functions of the existing site operations;
- The proposed built form is designed to mitigate any impacts on surrounding properties; and
- The proposed development is consistent with strategic intent identified under the Draft Macquarie Park Place Strategy.

The following key elements of the site and proposed development are noted:

2.6.1 Visual impact

Potential visual impacts have been assessed for a number of locations that are either in close proximity to the proposed development or at elevated vantage points.

A previous DA (LDA2018/0322) approval for the IC3w was granted consent for a smaller extension, of which Stage 1 has been completed, while Stage 2 has not commenced – refer to **Figure 3**. The intent of this SSD Application is to complete a further expansion of the constructed data centre, which would encapsulate the abovementioned Stage 2 works, plus additional built form. The DA approved scheme has been adopted as the baseline imagery from which any further visual impacts generated by the proposed developments are assessed against.

The revised development extension scheme does not exceed the 45m height limit for the site and uses materials and finishes that are already used within the existing development or within the previously approved DA drawings. Due to the site being well enclosed by vegetation and other development, it is not believed that the additional expansion of the building when compared to the DA approved scheme will cause significant detrimental effects for nearby visual receivers.

2.6.2 Infrastructure

This subsection provides an overview of the incoming infrastructure services required, with respect to capacity, availability and connections to facilitate the development.

2.6.2.1 Electricity

The site is currently supplied by existing site feeders, installed under earlier phases within the development.

Under the IC3w proposed development there is a requirement for future dual 33kV feeders, MDC have entered into an agreement with Ausgrid around the new feeder expansion as part of future fit out works of IC3w.

The above existing and future feeders serving the site are suitability sized to cater for the existing and proposed buildings on site.

2.6.2.2 Telecommunications

The site currently has dual diversely routed underground pathways for telecommunications cabling from street pits in Talavera Road to the IC2 Telco Rooms and to serve the IC3e data centre. The external pit and pipe system will be extended to serve the proposed development.

It is anticipated that carrier services will be organised directly by MDC. Dial Before You Dig (DBYD) plans indicate that here are multiple telecommunication services providers in the vicinities of the site.

2.6.2.3 Potable water

The existing Sydney Water portable supply is suitable to supply the combined water and wet fire services demand across the entire site.

The required flow rate for the site is 39L/s and the Pressure and Flow Enquiry conducted in previous stages indicates that the street flow rate is capable of delivering 50L/s. A new Pressure and Flow Enquiry is being conducted as part of detail design with existing pressure and flow information provided as part of the Infrastructure Report, prepared by HDR (**Appendix 20** of this EIS).

With the indicated flow rate of 39L/s it is anticipated that tanks and pumps will be required to meet uptime and tenant requirements.

A Sydney Water Feasibility application has been submitted to Sydney Water on 24 September 2021 to confirm Sydney Water's Infrastructure can cater for the new proposed potable water demands.

2.6.2.4 Sewerage

This site is serviced via an existing 300mm Sydney Water Sewer, and Sydney Water has confirmed that the existing main is suitable to serve the proposed IC3w works.

The 300mm diameter sewer main traversing through the site is currently concrete encased. Sydney Water have advised that the existing main is suitable and a new cut in has been designed near the IC3w southern elevation – based of previous IC3 demands.

A Sydney Water Feasibility application has been submitted to Sydney Water on 24 September 2021 to confirm Sydney Water's Infrastructure can cater for the new proposed waste demands.

2.6.2.5 Stormwater

A 3.5m wide stormwater easement (containing existing 1800mm diameter below ground pipe) traverses site draining from the southern boundary to the northern boundary. This pipeline connects into existing Council drainage within Talavera Road which continues to flow north.

The site consists of two (2) on-site detention tanks. OSD tank 1 with a volume of 90m^3 is located adjacent to the northern boundary and collects stormwater runoff from the existing building roof and hardstand areas on the eastern side of the site. A gross pollutant trap (GPT) and 22 stormwater filter cartridges treat stormwater runoff prior to discharge from the site. This treatment system has been over sized to compensate for treatment of flows from OSD tank 2.

OSD tank 2 is located in the under-croft area of the newly constructed building (IC3e as shown in **Figure 3**). This tank has a capacity of approximately 203 m^3. This tank was oversized in anticipation of the additional flows to be detained from the future building works. This tank currently collects stormwater runoff from the roof areas of newly constructed building. Stormwater runoff from the western hardstand areas drains to the outlet pipe from OSD tank via an GPT and connecting to Council's Ø1800 pipe adjacent to the front boundary.

2.6.2.6 Overland flow

An overland flow path exists within the site which conveys stormwater from an upstream catchment in Macquarie Park south of the site, through the site to Talavera Road.

This overland flow path is proposed to be retained but modified as part of the proposed works. A description of these works are included within **Section 3.2.1.3** of this EIS.

2.6.3 Transport and traffic

2.6.3.1 Road network

The local road network surrounding the subject site includes Lane Cove Road, Talavera Road and Khartoum Road. These roads are discussed below.

- Lane Cove Road: Lane Cove Road is a classified State Road (A3) and forms one of the major north-south arterial links in the northern / north-western suburbs. The road provides good connectivity to the wider arterial road network, notable to Ryde Road, M2 Motorway, Victoria Road and Devlin Street. Within the vicinity of the site, Lane Cove Road runs in a north-east to south-west direction. The road provides three through traffic lanes in each direction separated by a central median. The road has a posted speed limit of 70 km/h in both directions within the vicinity of the site.
- Talavera Road: Talavera Road is a regional road, generally aligned in the north-west to south-east direction along the frontage of the site. The road carriageway measures approximately 15m kerb to kerb with restricted kerbside parking permitted along both sides of the road near the site. This includes ticketed parking for five hours between 10:00am and 3:00pm, Monday to Friday. Talavera Road has a posted speed limit of 50km/h.
- Khartoum Road: Khartoum Road is a local road, generally aligned in the north-east to south-west direction. The road carriageway measures approximately 12m kerb to kerb with restricted kerbside parking permitted along both sides of the road. This includes ticketed parking for five hours between 10:00am and 3:00pm, Monday to Friday and parking for twelve hours between 7:00am and 7:00pm, Monday to Friday. Khartoum Road has a posted speed limit of 50km/h.

2.6.3.2 Public transport

The closest metro station is Macquarie Park Station, located 950m walking distance from the site (13-minutes walk). Macquarie Park Station services the Tallawong to Chatswood line with services running every 4 minutes during the peak hours and every 10 minutes in the off-peak hours.

The subject site is located within proximity to both high frequency bus and rail services. There are several bus stops close to the site, located on Talavera Road and Lane Cove Road.

There is sufficient public transport provision in the immediate vicinity of the site.

2.6.3.3 Pedestrian and cycling facilities

In the immediate vicinity of the subject site, pedestrian paths are provided on both sides of Talavera Road. Footpaths along these roads extend onto the wider network, providing passage on foot onto Lane Cove Road and Khartoum Road.

There are a number of off-road shared cycle paths near the site, with the main routes providing travel to Macquarie Park University, Epping and North Ryde. On-road cycle lanes surrounding the site also provide good cycle connectivity to the wider road network.

2.6.4 Cultural heritage

2.6.4.1 Aboriginal cultural heritage

There are no recorded Aboriginal sites located within the subject site.

The subject site landform has been modified and terraced and is therefore heavily disturbed.

No areas of Aboriginal archaeological sensitivity have been identified within the subject site.

2.6.4.2 Non-aboriginal (historic) cultural heritage

The proposal does not involve works that would impact a listed heritage item.

There is low potential that significant archaeological remains are present within the subject site.

2.6.5 Stormwater and Flooding

The site falls within the Industrial Creek catchment. Industrial Creek generally flows south to North discharging into the Lane Cove River. Industrial Creek has been built over during development of Macquarie Park and now consists mainly of below ground pipes and culverts. Industrial Creek alignment is located within the site. Wider catchment stormwater runoff follows the alignment of Industrial Creek. Stormwater runoff is generally conveyed through the site via a Ø1800 reinforced concrete pipeline at a depth of 4 – 6m below the existing site surface levels. This pipeline is contained within a 3.5m wide easement for drainage benefitting the City of Ryde.

In larger rainfall events, typically the 1%AEP the site is affected by overland flow. Flood waters inundate the site, entering near the southeast corner and discharging to Talavera via the northern boundary.

A detailed flood study has been prepared by Northrop and presented within **Appendix 26** of this EIS. The study has been prepared based on a previous approved development assessment using Council's adopted flood study – namely the Macquarie Catchment Flood Risk Management Study and Plan (Bewsher, 2011).

The results presented in **Section 6.1.11** of this EIS suggest that the proposed development is not expected to have a significant adverse impact on the subject site or in adjacent properties.

Northrop's Stormwater Management Report (**Appendix 25**) and Flood Assessment Report (**Appendix 26**) supporting this EIS provide greater detail Council's the trunk drainage system and flooding impacts.

Easements for drainage benefitting the properties to the east and west of the site run parallel to the rear boundary connecting 3.5m wide easement benefitting Council.

While the proposed development does not require any change to the existing easement, it may involve the possible relocation of a future stormwater easement that was approved under LDA2018/0322; refer to **Section 3.2** for further details on the proposed development.

2.6.6 Comparison against LDA2018/0322

The proposed development consists of an extension to the existing data centre, constructed under LDA2018/0322. Whilst Stage 1 (IC3e) of the development consent has been completed, the proposal of this SSD seeks to capture previously approved Stage 2 (IC3w) works, in addition to further built form.

In light of the particulars provided within **PART C** of this EIS, with respect to the current proposal, the following comparison table is provided to show the extent of change as compared to LDA2018/0322.

TABLE 8: COMPARISON – EXISTING APPROVAL VERSUS CURRENT PROPOSAL

Project Element	Existing Site (including Stage 1 of LDA2018/0322)	Current Proposal (including expansion)	Difference (+/-)
Total power consumption (MW)	28 MW	61 MW	+ 33 MW
Maximum building height	45 m	45 m	N/A
GFA	11,103 m^2	20,606 m^2	+ 9,079 m^2
No. back-up generators	16	34	+ 18
Diesel storage (L)	220, 400 L	638,400 L	+ 418,000 L
Car parking	101	71	- 30 *
Operational jobs	29	49	+ 20
Note: * consistent with Part 2, Condition 3 of LDA2018/0322			

2.6.7 Summary of site suitability

The subject site's consistency with applicable regional and local strategies is demonstrated in the comprehensive environmental assessment, provided in **PART F** of this EIS, which includes an analysis of all potential impacts, which has been informed by the relevant consultant reports. Accordingly, the environmental assessment prescribes recommendations and mitigation measures (where necessary), to account for all identified potential impacts, by the proposed development. The suitability of the subject site with regard to the proposed development, can be attributed to its ready ability to provide employment, its excellent access arrangements, its suitable contextual setting, and its minimal impact on the environment.

Accordingly, the EIS prescribes recommendations and mitigation measures (where necessary), to account for all identified potential impacts, by the proposed development. The suitability of the subject site to cater for the proposed development, can be attributed to:

- its ability to provide employment,
- its excellent access arrangements,
- its suitable contextual setting, and
- its minimal impact on the environment.

PART B of this EIS demonstrates the site's suitability for the proposed data centre extension.

PART C PROPOSED DEVELOPMENT

3.1 OBJECTIVES OF THE PROPOSAL

The aim of the proposed development is to provide a purpose-built Data Centre, in line with Industry Best Practice, resulting in:

1. Support the growth and transformation of the data storage realm;
2. Generate employment – during construction and once the development is operational;
3. Improve access to jobs for residents of the immediate community and wider locality;
4. Supplement, support and compliment the Macquarie Park Corridor and its strategic intent;
5. Demonstrate architectural excellence, through siting and design compatibility, with minimal visual impact; and
6. Provide suitable mitigation measures where required, to minimise any unforeseen impacts arising in the future.

3.2 DESCRIPTION OF THE PROPOSED DEVELOPMENT

Consent is sought to develop the subject site and expand the existing data centre, in accordance with the following provisions.

TABLE 9: PROPOSED DEVELOPMENT PARTICULARS	
Project Element	**Development Particular**
Site Area	20,094m^2 (approx.)
General	The proposed development is considered SSD, pursuant to Schedule 1, item 25 of SRD SEPP
Primary Land Use	Storage premises (data centre)
Operation	Data centre with total power consumption capacity up to 61 MW (additional 33 MW)
Total GFA	20,606 m^2 (9,097 m^2 new)
Floor Space Ratio	1.02 : 1
Building Height	45 m
Number of Stories	Five (5) storeys
Tree Removal	55 trees to be removed
Landscaping	2,743 m^2 (14% of the site) - Planting of 47 new trees
Earthworks	Minor earthworks are proposed beneath the building footprint range from a maximum of 0.25m cut to a maximum of 0.25m of fill. The extent of cut and fill includes: Cut: 799 m^3 Fill: 1,019 m^3 Import: 220 m^3
Car parking	71 spaces
Infrastructure and Services	Refer to **Section 3.2.1** below
Machinery and Plant	Refer to **Section 3.2.3** below
CIV	$ 289,731,682.00 (exc. GST)
Construction Jobs	Approximately 1,200 direct construction jobs
Operational Jobs	Approximately 49 ongoing jobs (total facility)

3.2.1 Site Preparation

3.2.1.1 Tree removal and retention

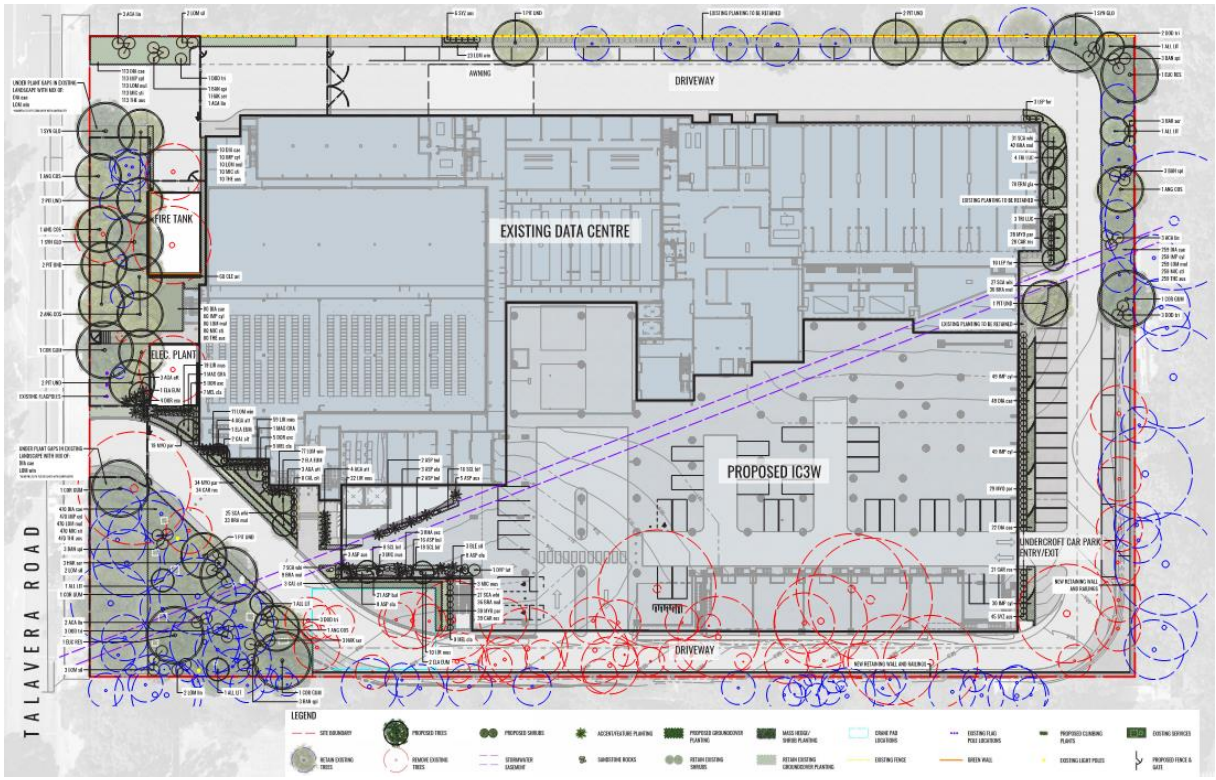


Figure 9 Landscape Detail Plan – tree locations (Source: Geoscapes, 2021)

One-hundred and twenty-six (126) individual trees and one group of trees have been identified and assessed in preparation of this proposal; this involves trees outside (but adjacent to) the subject site.

Fifty-two (52) individual trees and one group of trees have been recommended for removal to accommodate the development works. In addition, the proposal seeks to retain 58 trees existing trees (of which 39 are located within the subject site).

3.2.1.2 Earthworks

Minor earthworks are proposed as part of the development. The earthworks are required to allow formation of the overland flow path, such that it minuses depth and spread of water and construction of the perimeter access driveway.

The extent of cut and fill includes:

- Cut: 799 m^3
- Fill: 1,019 m^3
- Import: 220 m^3

Figure 10 demonstrates the extent of earthworks and the relative change in surface level as a resulting from the earthworks.

The earthworks beneath the building footprint range from a maximum of 0.25 m cut to a maximum of 0.25 m of fill. Deeper cut operations are required adjacent to the southern and western boundary of up to 0.6 m are proposed. Existing boundary levels will be maintained with the introduction low height retaining walls (up to 0.6 m high will) partially along each boundary.

Earthworks will occur under engineering supervision as the resultant surface will need to be suitable for future vehicle and building loads.

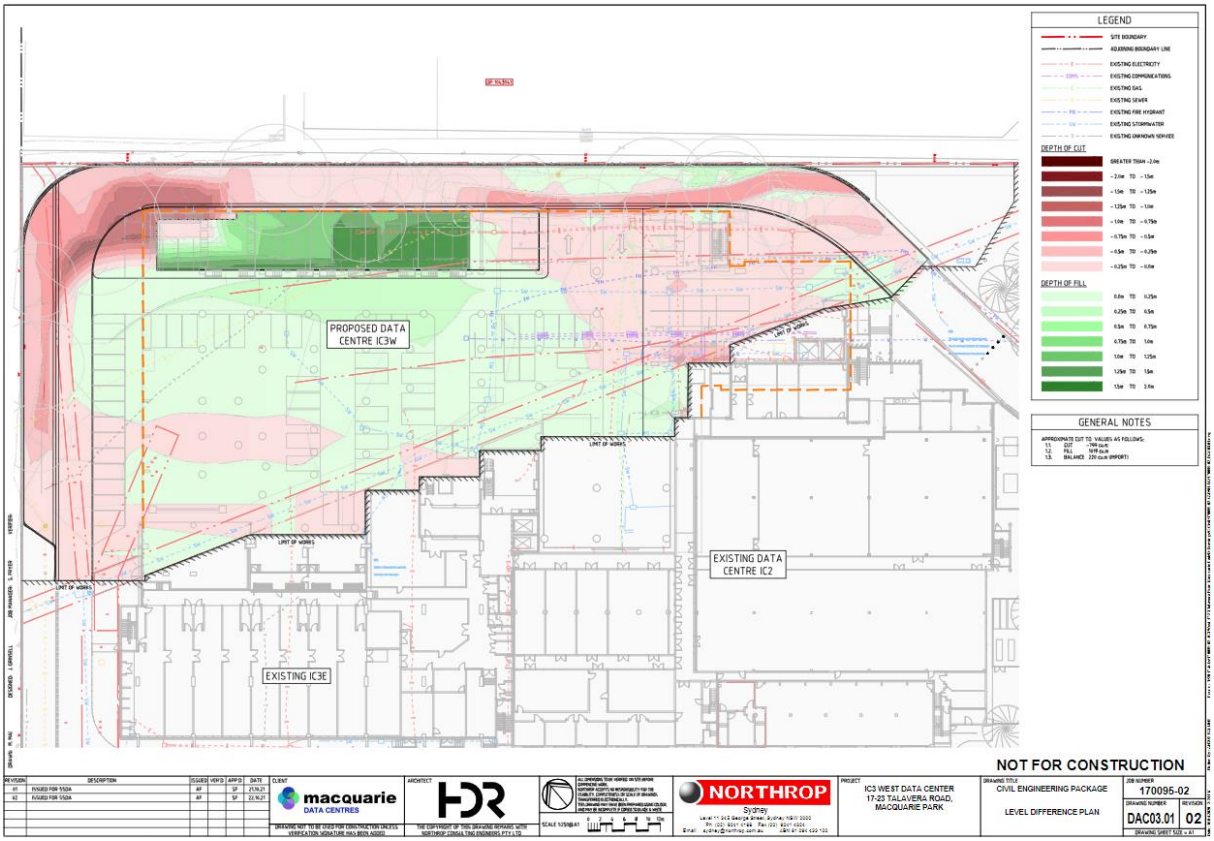


Figure 10 Earthworks Plan (Source: Northrop, 2021)

An erosion and sediment control plan (refer Stormwater Management Report within **Appendix 25** of this EIS) will be implemented during earthworks to manage the impacts of erosion and sedimentation.

Overall, the earthworks are minor and will result from some material being exported from site. Earthworks proposed generally lower the site levels to improve access and overland flow outcomes.

3.2.1.3 Infrastructure

The following utility connections available/required for the proposed development.

Electrical Services:

Under the IC3w proposed development there is a requirement for future dual 33kV feeders, MDC have entered into an agreement with Ausgrid around the new feeder expansion as part of future fit out works of IC3w.

The above existing and future feeders serving the site are suitability sized to cater for the existing and proposed buildings on site.

Telecommunications:

The subject site currently has dual diversely routed underground pathways for telecommunications, cabling from street pits in Talavera Road to the existing data centre. This external conduit and pit system shall be extended to serve the proposed development.

Sewer Drainage:

This subject site is serviced via an existing 300mm Sydney Water sewer, and Sydney Water has confirmed that the existing main is suitable to serve the proposed works.

The 300mm diameter sewer main traversing the site requires an encasement. Sydney Water have advised that the existing main is suitable and a new cut in has been designed near the proposed southern elevation.

Potable Water:

The existing Sydney Water potable water supply is suitable to supply the water and fire services demand of the combined development.

The required flow rate for the site is 39L/s and the Pressure and Flow Enquiry conducted in previous stages indicates that the street flow rate is capable of delivering 50L/s. A new Pressure and Flow Enquiry is being conducted as part of detail design with existing pressure and flow information provided as part of the Infrastructure Report, prepared by HDR (**Appendix 20** of this EIS).

With the indicated flow rate of 39L/s it is anticipated that tanks and pumps will be required to meet uptime and tenant requirements.

A Sydney Water Feasibility application has been submitted to Sydney Water on 24 September 2021 to confirm Sydney Water's Infrastructure can cater for the new proposed potable water demands.

Fire Hydrant System:

The building is required to be covered by a fire hydrant system throughout in accordance with National Construction Code (NCC) / Building Code of Australia (BCA) Volume 1 Section E1.3 and complying with AS 2419.1 – 2005. Internal fire hydrants shall be provided in accordance with AS2419 and BCA. Hydrants shall not be provided with data halls therefore more than one length of hose may be required for hydrant coverage.

Stormwater:

The proposed development will extend from the existing building, towards the western boundary. The building will be elevated such that it straddles both the Ø1800 pipeline and overland flow. The under-croft area will provide a clear zone above the pipeline of 10 m (from ground level to underside of structure) to allow for any future maintenance access by City of Ryde. This minimum head height requirement was agreed in the development consent of LDA2018/0322 and has been maintained for the proposed development.

The balance of the under-croft area will have a minimum head height of 2.5 m ranging up to 4.5 m and be utilised for passenger vehicle parking. This parking area will not extend over the Ø1800 pipeline. The entire under-croft area will also be utilised for conveyance of overland flow during the 1%AEP flood event.

The new building will be supported by concrete columns. The columns will be strategically located so no building loads are transferred to Council's Ø1800 pipeline and such that no adverse impacts are created to the overland flow path.

Stormwater runoff from the new building roof will be connected directly to OSD tank 2, which has the capacity to accommodate this additional flow.

The stormwater runoff from the western hardstand areas will be captured in a new drainage system that joins with the outlet pipe from OSD tank 2 ultimately discharging to Council's system near the northern boundary.

A 4.5 m wide easement for drainage has been approved as part of development works under development consent LDA2018/322. Following pre-lodgement consultation with Council, this easement is sought to be relocated (outside the proposed building footprint) as part of the proposed IC3w development. Refer to **Section 6.1.9.2** of this EIS for further detail on the proposed easement realignment. It is noted that discussions with Council regarding this item are ongoing, as documented within **Section 5.2** of this EIS.

3.2.2 Built Form

Construction of the proposal would involve no substantive demolition activities but will comprise minor earthworks (cut and fill), building and construction of pavements and hardstand, and construction of a new five (5) storey building.

The building shall comprise five (5) levels above ground, including Level 1 plant area, 4 upper levels of data halls, and a rooftop plant level. Basements are not proposed.

The design of the proposal must take into consideration the best practice of data centre design. Consideration has also been given, not only to the operation of the facility once fully completed, but also to the incremental fit out of the building and data halls. Paramount to this is recognition of the separation of existing completed areas and new construction areas in both IC3e and IC3w. Security of the existing tenanted areas and construction areas would be clearly separated.

The design of the proposal, whilst differing in scale from the existing built form, will achieve an overall cohesive visual outcome. A sympathetic and considered palate of forms, articulation and materials will result in an overall "one building" outcome, with each building element respecting the other.

In intent of the proposal is to:

1. Adopt vertical emphasis already established on campus.
2. Emphasis place emphasis on MDC brand through colour and materials palette adopted in the in the existing development, to ensure a cohesive campus.
3. Showcase secure nature of the building as well as plant that highlight the technical prowess.

The proposed floor plate has been designed to best practices of data centre design and to ft seamlessly with the existing building. Towards the Talavera Road boundary, the building has been purposely set back to allow a landscaped area to the entry point. This allows the proposed building to nestle into its surroundings and cohesively address the form and architecture of the existing building.

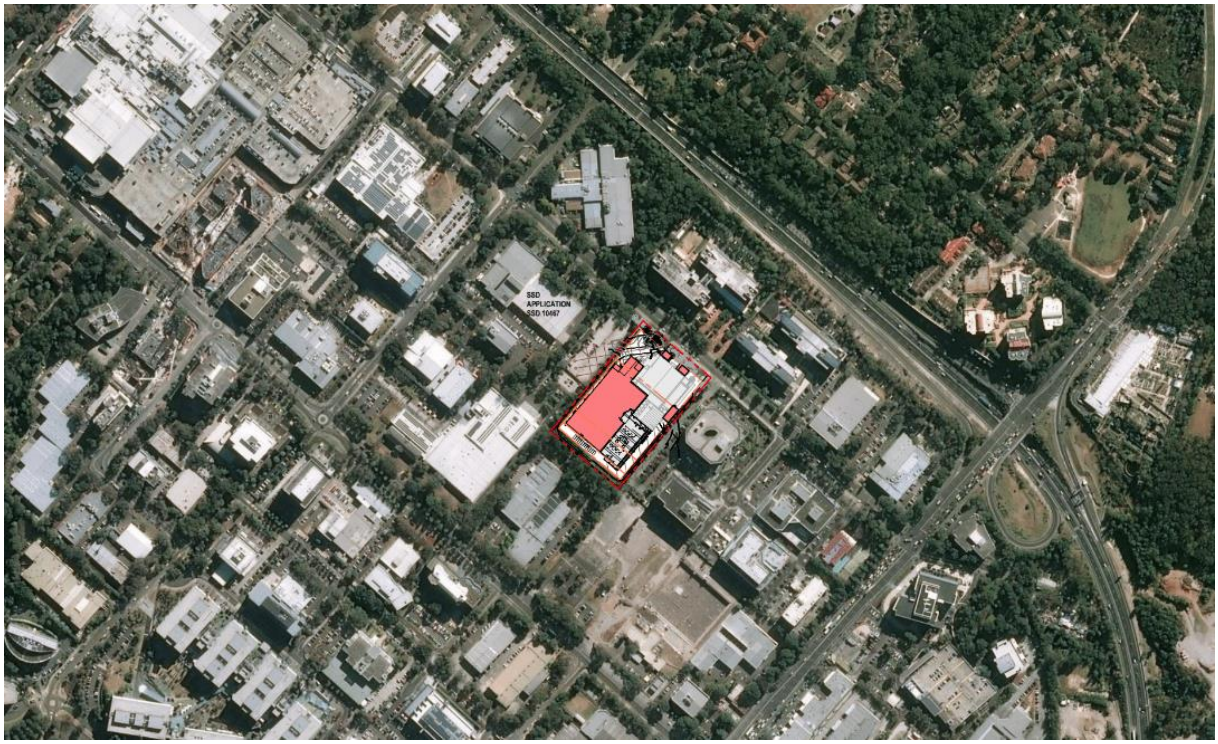


Figure 11 Location Plan (Source: HDR, 2021)

Figure 12 Indicative view of building from west (Source: HDR, 2021)

Figure 13 Indicative views of building from Talavera Road (Source: HDR, 2021)

3.2.2.1 Building envelope

The proposed building shall be attached to the existing facility at sensible locations to enable flow between the building areas. A campus look and feel is required with a commonality of soft services.

Envelope design has been developed to include a precast concrete and/or insulated sandwich panel facade (with decorative cladding). Areas of glazed façade are provided as part of the design development to permit natural light to selected areas without compromising the integrity of the data centre. A concrete roof (with waterproof membrane) has been provided with drainage to eaves gutters. The roof includes enclosed plant/pump rooms, as well as external areas for the mechanical plant. Consideration has been given to Council's requirements of building form, finish and articulation.

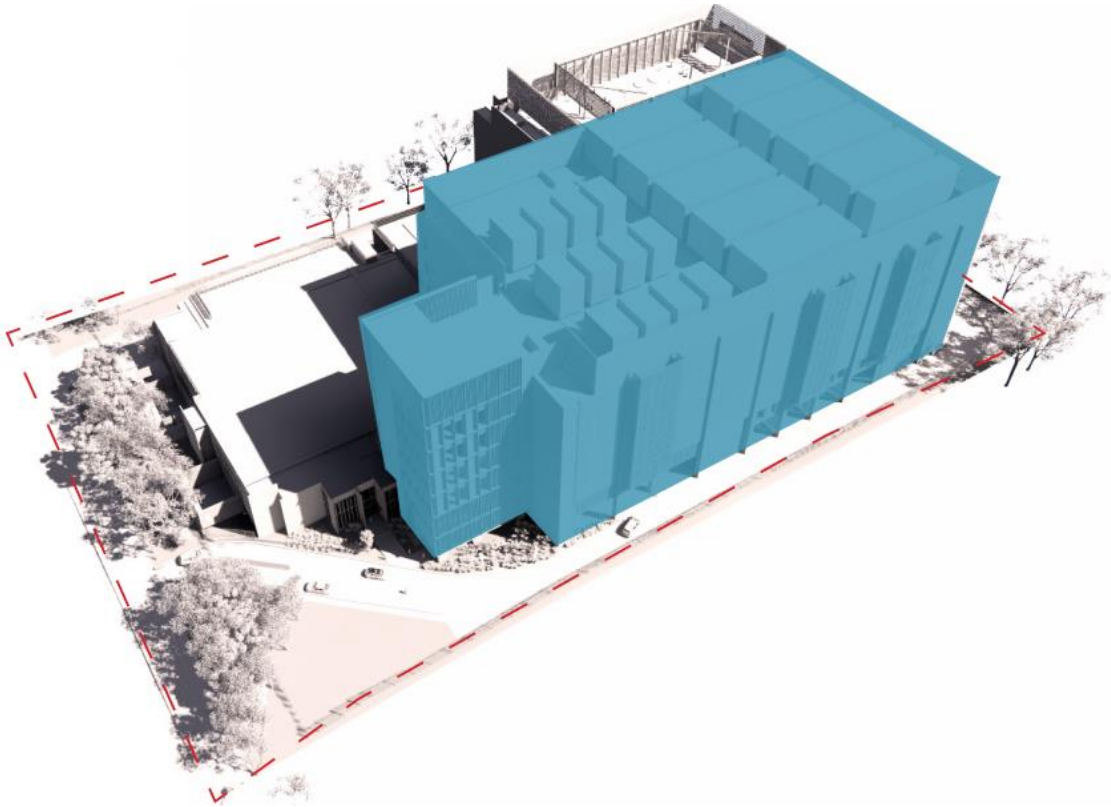


Figure 14 Indicative view of building from above showing proposed mass in blue (Source: HDR, 2021)

3.2.2.2 Plant and equipment

TABLE 10 below summarises the new mechanical services plant and equipment associated with the proposed IC3w. The location of the main items of plant are shown in **Figure 14**. Mechanical and electrical plant are installed to provide power and cooling to meet the required IT load capacity of the centre.

TABLE 10: PROPOSED OPERATIONAL PLANT & EQUIPMENT	
Plant/equipment and quantity	**Location on site**
Chillers x 8	Level 1
Chilled water pumps x 8	Level 1
Air handling units (AHU) x 8	Level 1
Computer room air conditioning (CRAC) x 84	Levels 2 – 5
Cooling towers x 8	Roof
Carpark exhaust fan x 1	Outlet on roof
Condenser water pumps x 8	Roof
Generators x 18	Roof, within acoustic enclosure

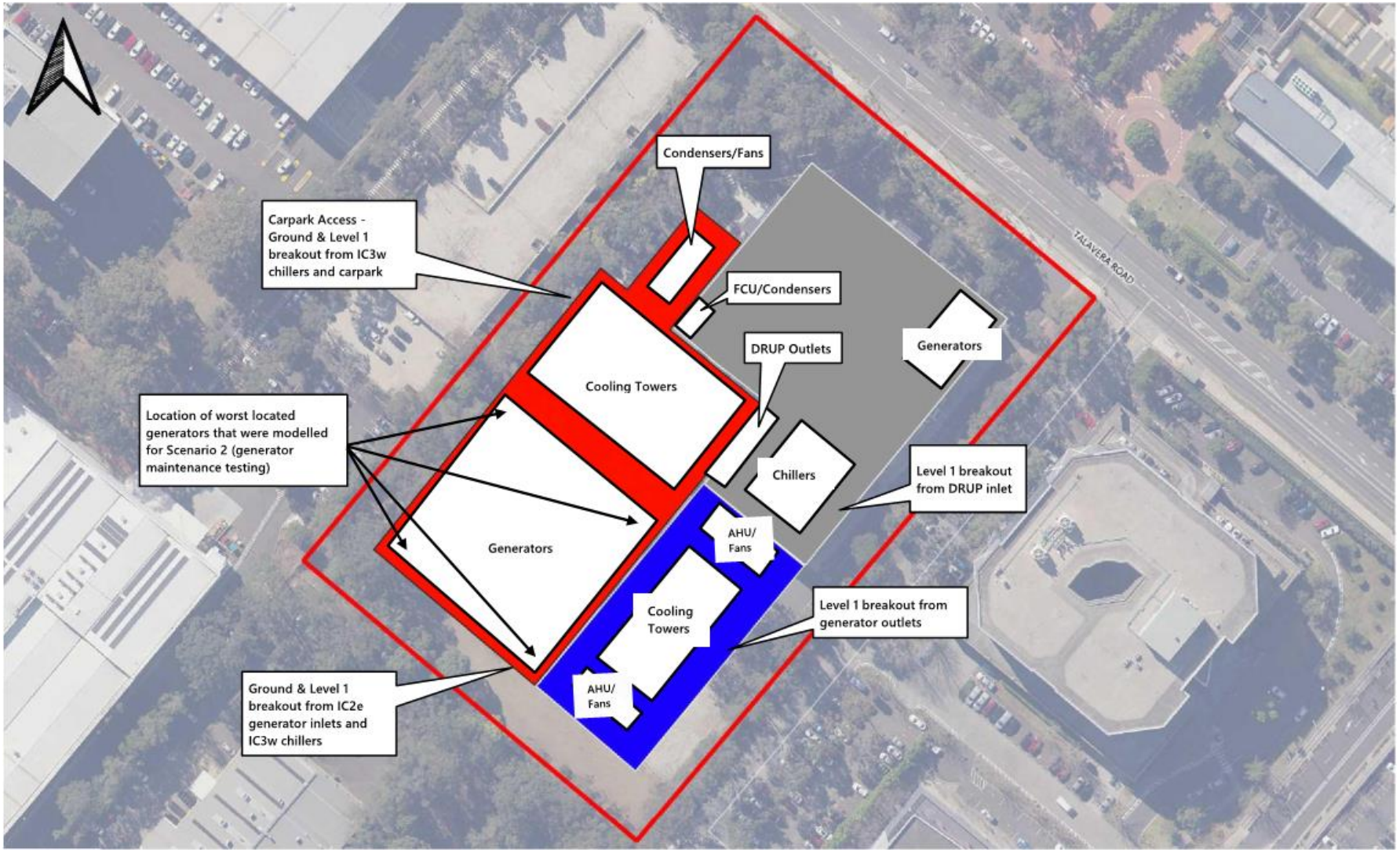


Figure 15 Location of main items of Mechanical Plant (Source: Renzo Tonin, 2021)

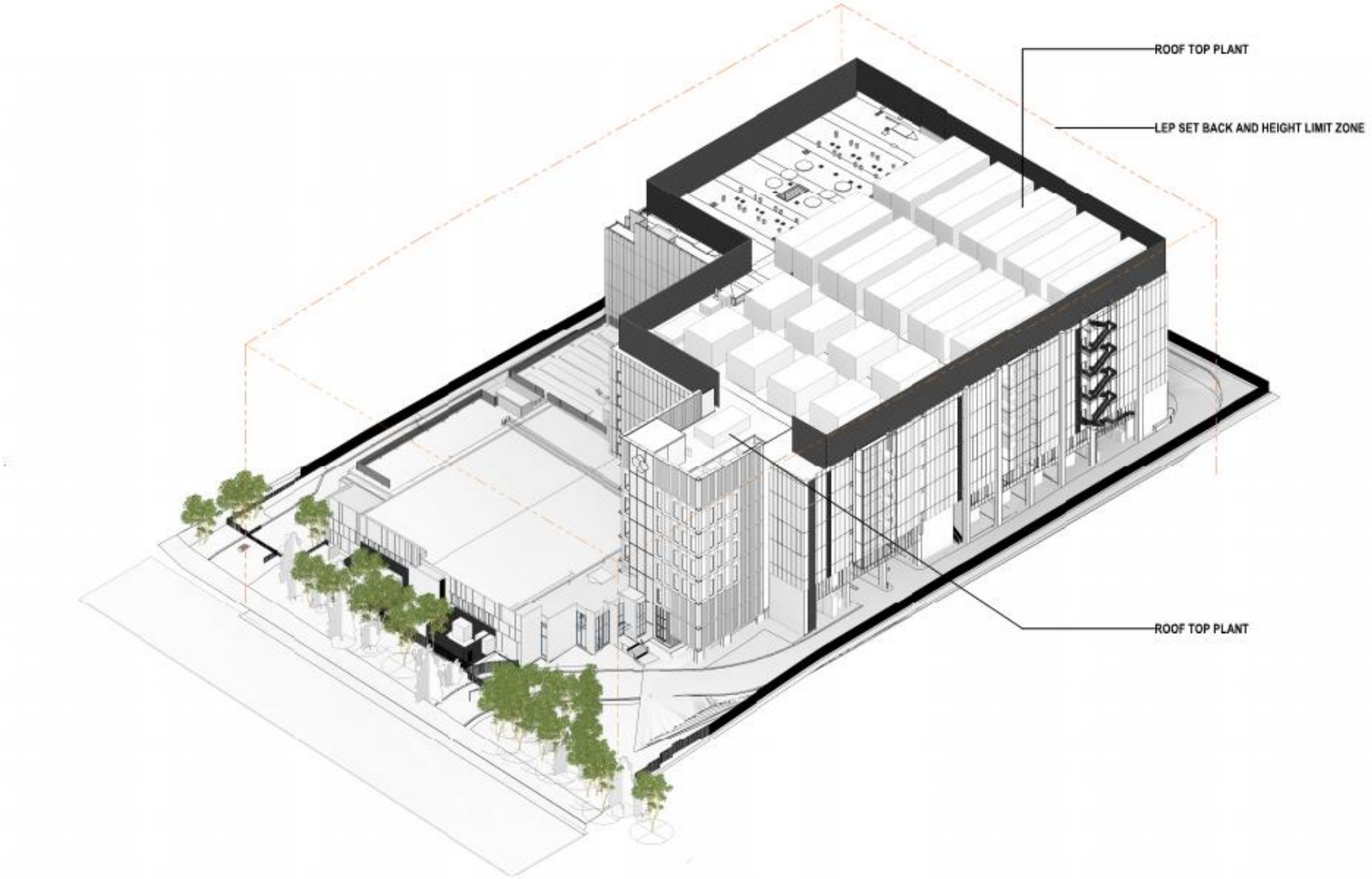


Figure 16 Perspective Drawing of Roof Top Plant (Source: HDR, 2021)

3.2.2.3 Internal fitout

The proposal includes four (4) levels of data halls, equivalent to 14 data halls. The data halls are intended to be fitted out with hardware in a staged manner, over time, as demand increases. The specifics of the data hardware are dependent on the requirements of the future customer.

It is noted that the data hall fitouts will occur on an as-needs basis.

The data halls are designed to allow for a cooling corridor to one side and electrical corridor to the opposite side of each data hall. The cooling corridor shall be separated from the data hall via a mesh cage / perforated metal type wall. The wall design shall meet the necessary security requirements. Access to the data hall shall be via a dedicated access door/s and will allow a clear 1,800 mm corridor from the entry door along the side of the data hall. This will facilitate the installation of future cages for tenants with access to these areas from the main corridor.

The built-form component of the proposed development also includes earthworks and infrastructure, for which consent is sought. The full package of Architectural Plans are included in **Appendix 7** of this EIS.

3.2.2.4 Height / scale

The proposed development would be in keeping in terms of scale of nearby developments. The proposed height of the new built form 45m (measured in accordance with the Standard Instrument). The heights portion of the development sits at an RL of 97.02 AHD.

The subject site has the capacity to employ incentive provisions under Clause 6.9 of the RLEP2014, to achieve a height of 45m – refer to **TABLE 17**.

3.2.2.5 Colour / materials & finishes

Colours proposed for the facades of the building are typical of this type of development with more muted recessive tones applied, that will transition well from the existing data centre. Particular emphasis has been placed on MDC branding, through transitioning of the colour and materials palette adopted in the Stage 1 development to ensure a cohesive campus.

Envelope design has been developed to include a precast concrete and/or insulated sandwich panel facade (with decorative cladding). Areas of glazed façade are provided as part of the design development to permit natural light to selected areas without compromising the integrity of the data centre. A concrete roof (with waterproof membrane) has been provided with drainage to eaves gutters. The roof includes enclosed plant/pump rooms, as well as external areas for the mechanical plant. Consideration has been given to Council's requirements of building form, finish and articulation.

High quality finishes have been proposed that will be most visible at close range.

The chosen palette of materials constitutes the following:

- GLZ01: performance glazing
- CLD01: solid aluminium cladding – blue, white, dark grey
- LVR01: acoustic louvers – monument grey
- CON01: precast concrete panels
- CLD02: perforated metal screen – light grey
- LVR02: vertical louvre – blue
- CLD03: expressed metal frame – blue
- CON02: concrete structure grey
- SS01: stainless steel flues

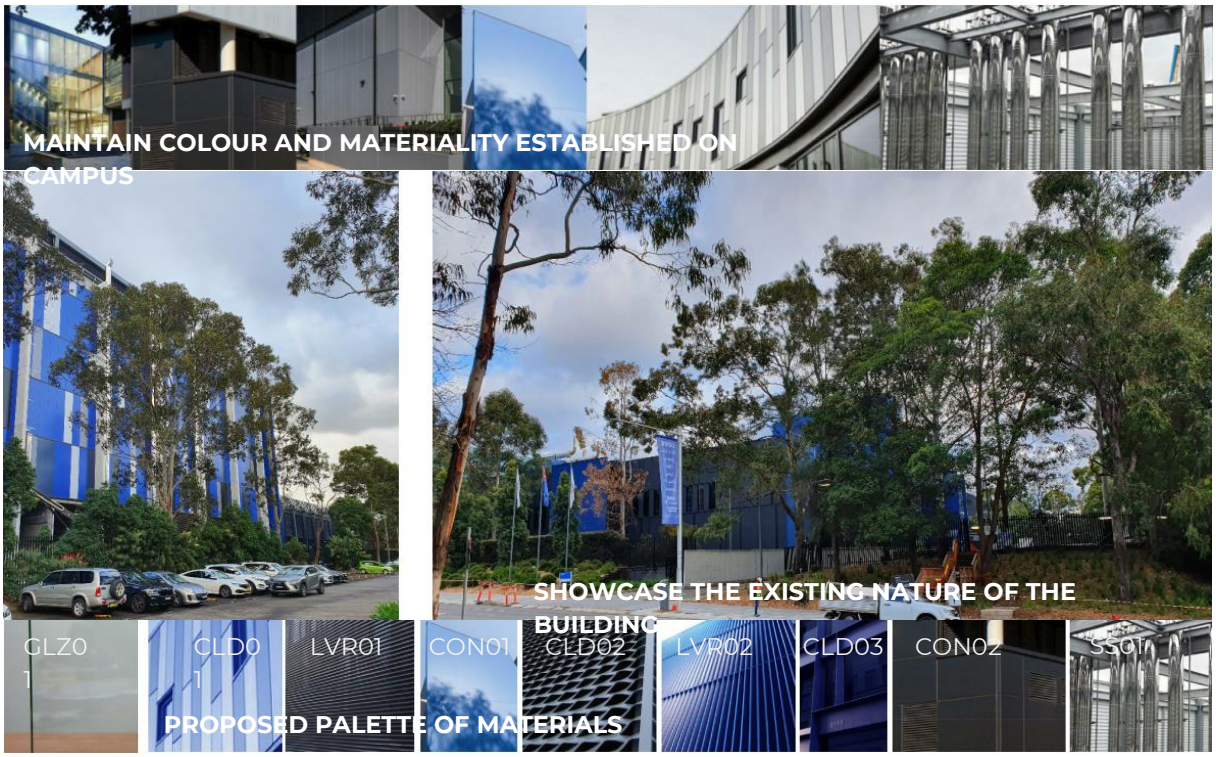


Figure 17 Proposed Palette of Materials (Source: HDR, 2021)

3.2.2.6 Landscape

To help mitigate and soften the building particularly from Talavera Road and receptors to the north, native species will be planted at regular intervals along the northern and eastern boundaries of the subject site.

Proposed landscaping for the IC3w expansion aims to offset loss of vegetation by replanting 47 endemic/native trees, approximately 170 shrubs and 5,600 groundcovers. This will enhance existing areas of landscaping within the site especially those to the east and adjacent to the street. By adding additional tree planting to Talavera Road, not only will the canopy cover be increased within the public domain, but also views from the street will be further screened providing visual mitigation.

Presentation to the building main entry will also be enhanced with a proposal to remove the existing monoculture and replace it with a more varied visually inviting landscape.

Proposed landscaping includes:

- Retention of existing vegetation along the street frontage, with supplementary native ground covers in gaps;
- Reintroduction of endemic tree planting into the site, utilising existing garden beds – species include those found from Coastal Shale Sandstone Forest such as Angophora costata, Corymbia gummifera, Eucalyptus resinifera and Pittosporum undulatum; understorey of small shrubs and groundcovers;
- Planting of narrow tall hedge along the western boundary;
- Removal of existing turf from the rear of the site and reintroduce endemic tree, shrub and groundcover planting utilising existing garden beds;
- Retention of existing vegetation along the eastern boundary;

Landscape Plans, prepared by Geoscapes Landscape Architecture, are included in **Appendix 9** of this EIS.

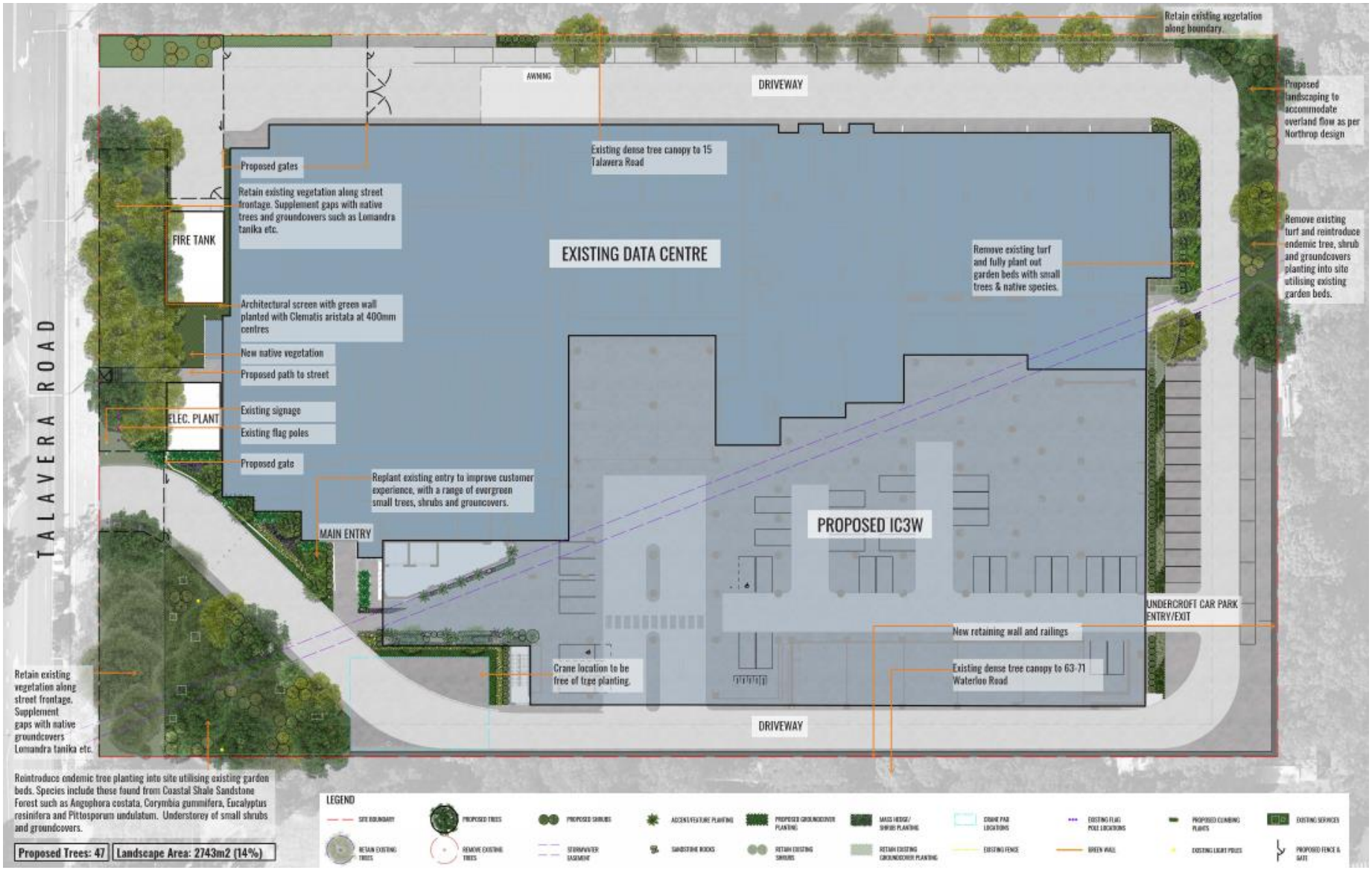


Figure 18 Proposed Landscape Plan (Source: Geoscapes, 2021)

3.2.3 Operational Details

Recent times have shaped the way we live and work, resulting in an increasing demand for cloud-based services. Such demand is playing a key role in overall market growth of data centres.

This proposal seeks to design, procure, construct and commission a brand new, multi-storey, world class, highly reliable data centre facility suitable for the needs of retail, wholesale and hyperscale computing customers. The facility is expected to reflect MDC's standing as a leading data centre developer and operator.

The proposal is expected to provide ongoing reliable and resilient service to the highest standards expected of data centre operators and customers.

The proposed development would see the expansion of the existing data centre facilities on the site. This expansion, adjoining the existing data centres, allows for additional data storage on site.

The new development would be managed by existing facilities management and security operations teams, operating under a centralised model, appropriately sized for this development.

The main product offerings at the site are:

- Data halls and colocation space to house customer IT equipment (data storage)
- Interconnect services for customers to connect to carrier networks

3.2.3.1 Hours of operation

The facility is proposed to operate 24 hours a day, seven days a week, in line with the existing operations of MDC and is required to provide continuous operation of the data centre service.

However, the main business activities including deliveries, maintenance and customer equipment connections are typically conducted during business hours Monday to Saturday.

3.2.3.2 Staff

The typical anticipated staffing requirements for the proposed development are as follows.

- Day shift 20-30 staff
- Night shift 10-20 staff

The maximum anticipated employee numbers on site at any one time is expected to be approximately 49 staff.

3.2.3.3 Customer and visitors

Customers using the site fall into two main groups:

- Most customers would visit the site for initial equipment installation, and thereafter manage their systems remotely, visiting the site only for break/fix or maintenance activities
- A small number of customers (typically customers with significant leased space) may lease office space in the tower building as a touch down space when supporting their installed equipment

Visitors to the site include specialist contractors and maintenance technicians, on a programmed basis, prospects, and project personnel.

Approximately 25-50 customers and visitors per day has been assumed. Customers and visitors access the site via the Talavera Road West Gate (main entry) via secure vehicle or pedestrian gates., with access managed by on-site security.

Customer and visitor parking is available on site. 71 parking spaces are planned at ground level.

3.2.3.4 Deliveries and truck movements

Deliveries are made via the two existing secure gates at the Talavera Road boundary.

The new development would utilise the existing loading facilities at the site:

- IC2 loading dock, located at the South West corner of the IC2 data centre.
- IC2 east loading bay, located on the Eastern side of the IC2 data centre
- IC3 loading dock, located on the Western side of the IC3 east data centre

The IC2 east loading bay would be improved under this development.

Loading docks are located well within the site to avoid traffic congestion at the boundary. Dock access paths are shown in the site plans.

All deliveries are managed by the Security team.

3.2.3.5 Operational activities

From a high level, the operational process on the subject site is as follows:

1. Data halls are provided with uninterruptable power and cooling to maintain the operating conditions for customer IT equipment. Data Centre Operations teams monitor, manage, and maintain the power and cooling systems to ensure high uptime consistent with data centre requirements.
2. On-site security personnel provide monitoring, patrols, event response and related security operations function
3. Customers lease data hall space to house their IT equipment. Customer transport their systems to the site and installed them into data halls using a mix of on-site teams and 3rd party transport and installation specialists.
4. Customers connect their systems to carrier networks through cross connect services
5. Customers operate their systems remotely, via carrier networks. Customers or their nominated service representatives attend as required to service their equipment
6. Waste generated predominantly comprises packaging materials for new equipment, and old electronic components. These materials are transported internally through the facility to the waste collection areas adjacent to loading bays for collection by contracted recycling and waste services.

3.2.3.6 Dangerous goods

There are no Dangerous Goods (DGs) to be used or stored at the facility and therefore the facility is not considered potentially hazardous with regards to DGs in accordance with the thresholds pertaining to *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development* (SEPP 33).

The proposed operations involve the storage and handling of diesel fuel and lithium-ion batteries.

TABLE 11: ESTIMATE OF STORAGE SUBSTANCES

Substance	Hazardous Class	Packing Group	Combustible Liquid Class	Total Storage	Manifest Quantity	SEPP 33 Level Findings
Diesel	N/A	N/A	C1	638,800 L	100,00 kg or L	**Safework NSW notification required**
				Equivalent to 540 tonnes	2,000 tonnes	Environmental Protection Licence (EPL) not required from NSW EPA
Lithium-ion batteries	Class 9	N/A	N/A	273,600 kg	10,000 kg or L	**Safework NSW notification required**

Diesel fuel to be stored on site, is not classed as a DGs, but is classed as a C1 Combustible Liquid provided no flammable liquids are stored with the diesel. No flammable liquids will be stored with the diesel; therefore, the proposed storage of diesel will be classed as a C1 Combustible Liquid.

Note that C1 combustible liquids are not a dangerous good under UN (United Nations) classification. However, they are defined as dangerous goods under NSW workplace legislation. Where dangerous goods are used or stored in volumes greater than the manifest quantities specified in schedule 11 of the *Work Health and Safety Regulation 2017*, Safework NSW must be notified, which will include manifests and lodgement an emergency plan to Fire and Rescue NSW.

Lithium-ion batteries are Class 9 Miscellaneous dangerous substances and articles, which are excluded from the SEPP 33 screening process.

Hazards associated with these lithium-ion batteries relate to fires and are covered within the Fire Safety Strategy prepared by Innova Fire Safety Specialists, which forms **Appendix 19** of this EIS. Reference should be made to **Section 6.1.8** of this EIS for further detail.

In the proposed development, lithium-ion batteries will be contained in Vision Revo Le TP200 Battery cabinets. Estimates of total quantity of lithium-ion batteries are based on the weight of cabinets (900kg) and 304 cabinets in IC3w. This gives an estimate of total quantity of lithium-ion batteries as 273,600 kg for IC3w. The existing Data Centre does not have lithium-ion batteries. Note this is likely to be an overestimate as the supplier details do not specify weight of lithium and therefore the total weight may include non-lithium components, such as wire, frames, etc.

There will be no transport of DGs associated with the facility.

3.2.4 Construction Staging

The approval strategy seeks to obtain Development Consent to complete the construction works over several construction stages upon issue of the relevant Construction Certificates; however, any such staging does not constitute staged development as defined under Section 4.22 of the EP&A Act, 1979.

The approximate phases and duration of works are as follows:

1. Stage 1 – minor earthworks and civil works, including piling = 6 months
2. Stage 2 – construction of main building = 6 months
3. Stage 3 – deliveries and initial fitout of the data centre, including operational plant and equipment = 9 months

In addition to the above, it is noted that the fitout of remaining data halls would be gradual, on an as needed basis. This would be driven by tenant uptake of data halls and may occur over a period of up to 3 to 5 years, depending on market demand.

3.2.5 Construction Hours

Construction works for the project are proposed to take place during and outside the standard construction hours, as summarised in **TABLE 12** below.

TABLE 12: CONSTRUCTION HOURS AND ASSOCIATED PROPOSED ACTIVITY

Defined hours		**Proposed Construction Activity**
Standard hours	▪ Monday to Friday 7:00am to 6:00pm ▪ Saturday 8:00am to 1:00pm ▪ No work performed on Sunday and Public Holidays	All activities: ▪ Minor earthworks and civil works ▪ Building construction ▪ Building fit-out
Extended hours Period 1	▪ Monday to Friday 6:00am to 7:00am and 6:00pm to 7:00pm ▪ Saturday 6:00am to 8:00am and 1:00pm to 5:00pm	▪ Building construction ▪ Building fit-out

TABLE 12: CONSTRUCTION HOURS AND ASSOCIATED PROPOSED ACTIVITY		
Defined hours		**Proposed Construction Activity**
	▪ Sunday 7:00am to 3:00pm	
Extended hours Period 2	▪ Remaining hours ▪ Monday to Friday 7:00pm to 6:00am ▪ Saturday 5:00pm to 6:00am ▪ Sunday 3:00pm to 7:00am	▪ Internal fit-out works with hand tools only – Only when building fabric has been completed ▪ No external activities, only light vehicles accessing site

3.3 PROJECT NEED

Increasing the capacity and capability of secure data storage and cloud-based infrastructure is of regional, state and national significance. The events of recent times have radically shaped the way we live and work. From wild weather events to geopolitical tensions, a global pandemic and the resulting move to online business. These macro-economic forces have created challenging conditions for many enterprises. Traditional business models are being pushed aside and how a company responds will determine its future – adapt and survive or resist and fold.

Many organisations have used this period to reassess their physical footprint, as well as their financial and operational models, in a bid to emerge leaner and more efficient in a post-pandemic world.

The massive demand for cloud-based services, is generating more data and driving demand for localised storage offerings.

Nationally, data centres are a foundational element of cyber security. Cyber security is one of the Federal Government's six (6) 'Priority Industry Growth Sectors', and the State and Federal Governments both have cyber security strategies in place. AustCyber's *Cyber Security Sector Competitiveness Plan* (2020 Update) notes a need for critical infrastructure (which includes data centres) to enable the rapid digitization of the Australian economy. Cyber security is a 'horizontal sector' that creates growth opportunities for other industry priority growth sectors, including advanced manufacturing and medical technologies and pharmaceuticals.

The strategic importance of the subject site, Macquarie Park and the Eastern Economic Corridor to the regional and national economy is outlined in the Greater Sydney Commission's (GSC) North District Plan. Macquarie Park is identified as a strategic centre and health and innovation precinct, anticipated to support between 73,000 (baseline target) and 79,000 (higher target) jobs by 2036 (an additional 15,000-19,000 jobs on 2016 estimates). Outcomes supported by this proposal are consistent with the strategic direction of A Metropolis of Three Cities and the North District Plan (GSC 2018). The proposed development aligns with the following planning priorities of the North District Plan:

- N8: Eastern Economic Corridor is better connected and more competitive: The Eastern Economic Corridor extends from Macquarie Park to Sydney Airport, containing close to a third of Greater Sydney's jobs. The proposal would contribute to further job creation in this respect.
- N9: Growing and investing in health and education precincts: The proposed data centre expansion at the subject site supports the growth of the Macquarie Park Corridor, which is intended as a hospital and high-tech industrial employment hub.
- N10: Growing investment, business opportunities and jobs in strategic centres: The proposed data centre expansion supports improved access to jobs, goods and services in the Macquarie Park strategic centre.
- N13: Supporting growth of targeted industry sectors: Increased data storage capacity would enable economic opportunities created by changing technologies, embracing opportunities to expand start-up and digital innovation that can allow people to work closer to home.

The provision of data storage provides a platform for a competitive digital economy, with increased capacity creating the conditions for multinationals to enter the Australian market. CBRE (2020) *CBRE Research: Asia Pacific Data Centre Trends H1 2020* identifies Sydney is one of four tier one data centre markets in the in Asia-Pacific, recording the strongest growth in IT capacity in the Asia Pacific region in the last financial year – an increase of 76%. This is significantly greater than comparable cities such as Singapore (14%) and Hong Kong (27%).

Importantly, the proposed development would provide data storage solutions for both public and private cloud, not just public cloud. This enables the proposal to support services for multinational corporations that require their own private hosting solutions, as well as Tier 1 Government agencies. Emerging digital technology (including cybersecurity, AI and quantum computing) is a priority industry to achieve Global NSW's vision for a globally connected, smart and vibrant economy.

Further, the NSW Government has states that 'each data centre development directly contributes as much as $1 billion in construction and fit-out costs to the NSW economy and forms critical infrastructure for the IT sector', emphasising the importance of these investments towards economic stimulus.

The need for data centres was given a burning platform by changes to business as usual catalysed by COVID-19. The NSW DPIE recognises data centres as a type of development 'well-placed' to support short-term economic recovery from COVID-19. Data centres were included as one infrastructure asset encouraging investment and job-generating development in DPIE's Productivity Acceleration Package. This relative importance is reflected in amendments to the SRD SEPP, which temporarily allows greater scope for warehouses and data centres to be assessed as SSD.

The proposed development is an expansion to the existing data centre, co-located with an existing facility that is demonstrated to operate consistent with character of local area. The expansion would further support the secure operation of business to business and business to consumer services, helping provide employment-generating opportunities in the professional services, start-up and creative industries in the City of Ryde LGA, the Macquarie Park Innovation District and the Eastern Economic Corridor. If additional data supply is not provided in well suited locations, additional pressure would be placed on cloud-based storage capacity, limiting the capability of digital transformation in economy.

The proposed development would assist in providing new employment opportunities (directly and indirectly), through the promotion of further industry diversification in regional growth industry sectors (i.e. ICT sector). Accordingly, this proposal would not alter the quantity or configuration of land currently zoned for commercial-related uses pursuant to the B7 Business Park zone under RLEP2014. Rather, the proposed development would represent a logical extension to the existing data centre approved at the subject site, under LDA2018/0322. The proposal would support the retention and maintenance of existing commercial land stocks and employment objectives, whilst promoting land use diversification (and generating new employment sources), and would generate more employment through the relevant planning, construction, operational and maintenance stages.

The proposed increase in capacity seeks to align with the demand of committed customers, with contractual commitments.

Additionally, the proposed development would see the following public benefits:

- Supporting a distributed work model and the ability to 'work from anywhere'. There is a liveability benefit from enabling digital infrastructure that extends beyond the precinct, supporting people to work flexibly if it suits their circumstances;
- Reduced travel distances, leading to savings in time and fuel for local working residents, due to much better access to the subject site, as opposed to other dense employment areas at the local level. It is noted, that a reduction in travel times and distances generates related benefits, including reduced vehicle wear and tear, reduced fuel costs, reduced pollution, reduced traffic congestion, reduced risks of car accidents and more time which can be spent either working, socialising or undertaking other activities;
- New employment opportunities from other industries enabled by increased capacity and capability, such as knowledge sector businesses operating within the City of Ryde LGA and Macquarie Park Innovation District;
- Job creation near homes and consequent economic multiplier impacts, which boosts the local economy.

NSW's economic development ambitions place an increased reliance on the role of the digital economy and related investment in leading-edge physical infrastructure. The subject site will be one of the most advanced data centres in Sydney, a vital investment in supporting economic growth, creating jobs of the future, building sovereign security skills, and offering protection against cyber threats.

NSW Government's Jobs Plus Program commits $250 million to strengthening the state's economy, creating up to 25,000 jobs before 30 June 2022 by supporting companies expanding their footprint in NSW. Through Investment NSW, the Jobs Plus Program has confirmed its support for this project, providing infrastructure rebates and payroll tax relief to accelerate the creation of additional jobs on this site. This support will facilitate the development of a new Sovereign Cyber Security Centre of Excellence, bringing NSW one step closer to its vision of being the leading cyber security jurisdiction in the Asia Pacific Region. The Centre will create more than 1,200 immediate indirect jobs, and host initial 31 highly skilled specialist roles by 2024, growing the state's workforce of cyber security experts.

3.4 CONSIDERATION OF ALTERNATIVES

The purpose of the proposed development is to react and plan for the increase in data storage demand, whilst contributing towards the intended commercial character and nature of the B7 Business Park zone; providing a logical extension to an existing data centre, to provide secure, reliable and scalable solutions for cloud, content and large enterprise customers to house their high rapidly growing volumes of data and information. The proposed development seeks to ensure:

- It is compatible with surrounding development and the local context;
- It would provide increased operational efficiencies for storage and distribution of data;
- It would result in minimal impact on the environment; and
- It would allow for the implementation of suitable mitigation measures, where required.

Overall, the scale of the proposed development is considered suitable, and the built form proposed would completely enhance and renew an undeveloped and underutilised land portion into a modernised, state-of-the-art data centre, which evolves as a logical extension to an existing data centre. The site design and layout of the built form proposed, seeks to maintain consistency with the zone objectives under RLEP02014 and enhance the underlying commercial character intended for the site, which is zoned for such permissible land uses. Furthermore, this would be achieved by the resultant built form that would reinforce the nature of the land use and is sensitive to the surrounding environment.

The options considered and subsequently dismissed, in arriving to the current proposal with regard to the proposed development included:

(a) 'Do Nothing' Scenario

This option was dismissed as the objectives of the proposal would not be met, including the objective of increasing data storage to meet the growing economic demand. If the proposed development was not to proceed, the site would not achieve its full capacity.

Furthermore, this option would not fulfil the end user's objectives pertaining to data storage requirements on the site as approved under LDA/2018/0322. Accordingly, it would not increase the availability to increase data storage and distribution potential for data in close proximity to the wider Macquarie Park Corridor and Sydney CBD.

As mentioned above, increasing the capacity and capability of secure data storage and cloud-based infrastructure is of regional, state and national significance. The 'do nothing' scenario would fail to further support the secure operation of business to business and business to consumer services, helping provide employment-generating opportunities in the professional services, start-up and creative industries in the City of Ryde LGA, the Macquarie Park Innovation District and the Eastern Economic Corridor. If additional data supply is not provided in well suited locations, additional pressure would be placed on cloud-based storage capacity, limiting the capability of digital transformation in economy.

Without the proposed increase in capacity, MDC would not be capable of meeting customer contractual commitments.

Based on the above and the robust justification provide within **Section 3.3**, the 'do nothing' scenario is dismissed.

(b) Development on an Alternative Site

Consideration was given to carrying out development on alternate sites, with viable alternative options in the Australian Capital Territory (ACT) and Victoria. Macquarie Park is an attractive site as it appeals to the broader target market of global cloud platforms, NSW & Commonwealth Governments, and domestic and global multinational corporation customers. Further, the proposed development would strengthen cybersecurity and secure hosting services offering in NSW.

Beneficial characteristics of the subject site for the proposed development include:

- It's location, subject to the provisions of the B7 Business Park zone pursuant to the provisions of RLEP2014 and the ISEPP;
- All potential environmental impacts concerning the proposed development are able to be suitably mitigated within the site;
- The proximity to the regional road network provides accessibility and linkages to the broader Sydney Metropolitan Region and regional areas of NSW;
- The capability for continued employment-generating opportunities (both directly and indirectly), during both the construction and operational (including maintenance) phases;
- It's consistency with the surrounding commercial nature of the area;
- The subject site has not been identified as containing any items of Heritage significance, including Aboriginal Cultural Heritage and State or Local Heritage items, that require further consideration; and
- The subject site can be developed with appropriate visual amenity achieved given its surrounding context.

(c) Different Site Configuration

The configuration of the proposed development was chosen based on the subject site's topography; road access; the existing data centre facility adjoining and operational efficiencies; as well as the need to respond to the character of the surrounding areas. It is noted that a different site configuration would not have been able to respond to the abovementioned site opportunities and constraints. This option was therefore not considered appropriate.

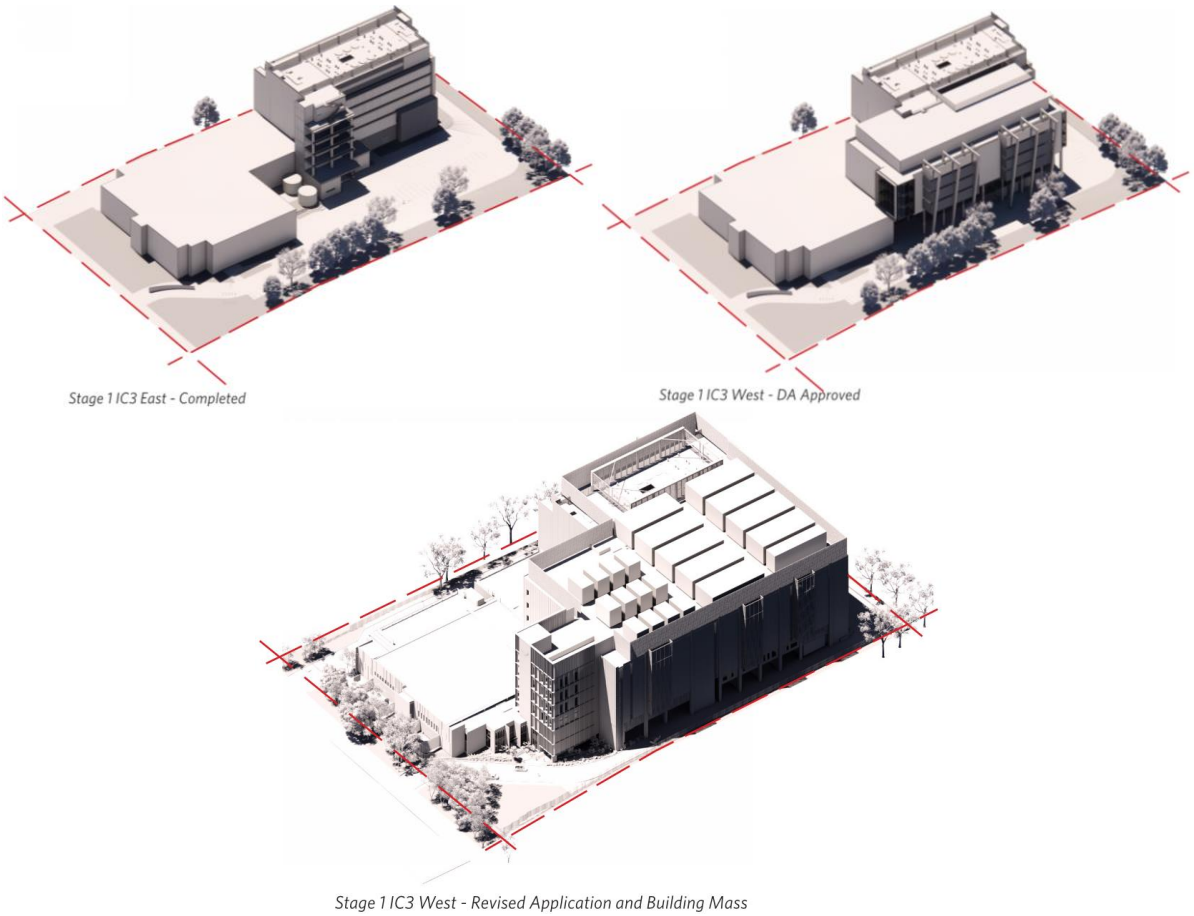


Figure 19 Design Development (Source: HDR, 2021)

The evolution of the proposed development is depicted in the above diagrams (**Figure 19**).

Notwithstanding, the proposed development is justified on the basis that it is compatible with the locality in which it is proposed, resulting in positive social and economic benefits, whilst appropriately managing and mitigating any potential environmental impacts requiring consideration. The proposal also leverages from previous investments in site infrastructure.

From a locational perspective, the subject site was chosen as it would be able to accommodate a suitable platform and scale of development proposed. Accordingly, the site's locality is considered satisfactory from a strategic standpoint, for which the proposal responds to the commercial character intended for the site and immediate locality; and the limited environmental constraints which make the site suitable for development for the purposes of a data centre.

In light of the above information, the proposal for the purpose of a data centre expansion at the subject site would allow for the delivery of more data storage supply to the market.

PART D LEGISLATIVE AND POLICY FRAMEWORK

4.1 CONTROLS AND POLICIES OVERVIEW

The following current and draft Commonwealth, State, Regional and Local planning controls and policies have been considered in the preparation of this application.

Commonwealth Planning Context

- *Environment Protection and Biodiversity Conservation Act 1999*

State Planning Context

- *Environmental Planning and Assessment Act 1979*
- *Environmental Planning and Assessment Regulation 2000*
- *Protection of the Environment Operations Act 1997*
- *Biodiversity Conservation Act 2016*
- *State Environmental Planning Policy (State and Regional Development) 2011*
- *State Environmental Planning Policy (Infrastructure) 2007*
- *State Environmental Planning Policy No 33 – Hazardous and Offensive Development*
- *State Environmental Planning Policy No 55 – Remediation of Land*

Strategic Planning Context

- *Greater Sydney Region Plan – A Metropolis of Three Cities*
- *North District Plan*
- *Future Transport Strategy 2056*

Local Planning Context

- *Ryde Local Environmental Plan 2014*
- *Ryde Development Control Plan 2014*

This proposal has been carefully assessed against the requirement and objectives of all of the above planning statutory and policy documents. A detailed analysis is set out in the following sections:

4.2 COMMONWEALTH PLANNING CONTEXT

4.2.1 Environment Protection and Biodiversity Conservation Act 1999

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), any action (which includes a development, project or activity) that is considered likely to have a significant impact on Matters of National Environmental Significance (MNES) (including nationally threatened ecological communities and species and listed migratory species), must be referred to the Commonwealth Minister for the Environment. The purpose of the referral is to allow a decision to be made about whether an action requires approval on a Commonwealth level. If an action is considered likely to have significant impact on MNES, it is declared a "Controlled Action" for which formal Commonwealth approval is required.

Referral to the Commonwealth Minister is not required.

4.3 STATE PLANNING CONTEXT

4.3.1 Environmental Planning and Assessment Act 1979

Pursuant to Section 4.36(2) of the EP&A Act, a *State environmental planning policy may declare any development, or any class or description of development, to be State significant development*.

The proposed development constitutes SSD as detailed in **Section 4.3.6**.

Further, the proposal is deemed to be entirely consistent with the EP&A Act, particularly Clause 1.3.

The following responses are provided regarding each Object listed in Clause 1.3:

TABLE 13: EP&A ACT OBJECTS	
Object	**Description**
(a)	*to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,*
	Response: *to promote the social and economic welfare of the community* The proposed development strongly promotes the social and economic welfare of the community, as is driven by the significantly increasing demand for cloud-based storage. The proposal would act as an employment generator, both directly (through onsite jobs) and indirectly (through the capacity of growth for its customers). It is anticipated that the proposal would generate jobs in the order of: ▪ 1,200 construction jobs ▪ 49 direct operational full-time equivalent jobs The creation of these employment opportunities would have a direct impact on both the local and broader communities. This access to both construction and operational jobs, is highly significant, given the scale, quantum, type and location of this employment, nearer to where people live. NSW's economic development ambitions place an increased reliance on the role of the digital economy and related investment in leading-edge physical infrastructure. The subject site will be one of the most advanced data centres in Sydney, a vital investment in supporting economic growth, creating jobs of the future, building sovereign security skills, and offering protection against cyber threats. NSW Government's Jobs Plus Program commits $250 million to strengthening the state's economy, creating up to 25,000 jobs before 30 June 2022 by supporting companies expanding their footprint in NSW. Through Investment NSW, the Jobs Plus Program has confirmed its support for this project, providing infrastructure rebates and payroll tax relief to accelerate the creation of additional jobs on this site. This support will facilitate the development of a new Sovereign Cyber Security Centre of Excellence, bringing NSW one step closer to its vision of being the leading cyber security jurisdiction in the Asia Pacific Region. The Centre will create more than 1,200 immediate indirect jobs, and host initial 49 highly skilled specialist roles by 2024, growing the state's workforce of cyber security experts. *a better environment by the proper management, development and conservation of the State's natural and other resources* Through informed architectural design, the proposed development incorporates a number of sustainable design principles and includes initiatives, designed to mitigate environmental impacts.
(b)	*to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,*
	Response: The intent of the proposed development is to create, through siting, design, landscaping and architecture, a high quality built form. The proposal demonstrates the architectural features proposed for the subject site, comprising the following key design elements, including: ▪ Articulation through the use of mixed materials and colouring, variation in building height, and architectural finishes; ▪ Integration of awnings, screens, glazing and feature windows; ▪ Installation of solar panels; ▪ Addition of complementary landscaping, including shade trees. The following Ecologically Sustainable Development (ESD) measures are proposed for the development: ▪ Energy – including improved energy efficiency across the buildings and its associated sources.

TABLE 13: EP&A ACT OBJECTS	
Object	**Description**
	▪ Passive Design Principles – reducing the projects overall requirement for building services. ▪ Water Efficiency – including reduced potable water demand. ▪ Waste Management – including the incorporation of a waste treatment plant. ▪ Ecology – Maintaining ecology through landscaping where practical.
(c)	*to promote the orderly and economic use and development of land,*
	Response: The siting and location of the proposed development is highly logical, given the locality of the existing data centre, which will work hand-in-hand. The proposed development of the subject site is both logical and orderly, based on the following: 1. Its proximity to the existing data centre; 2. It would deliver employment-generating opportunities in both the construction and operational phases in an area already earmarked by both State and Regional Policy for employment; 3. It would provide a new economically and ecologically-sustainable development, delivering new industry-best-practice in data centre construction; 4. It would deliver a facility with enhanced access to the regional road network, including the M2 Motorway, providing improved worker travel-connectivity to the wider locality; 5. It would have minimal impact on the environment, with best-practice sustainability measures, to promote ecologically sustainable development; 6. All necessary infrastructure can be accommodated, allowing operations to commence at no cost to Government; The proposed development is also deemed orderly because the land uses proposed would not pose a risk to any existing commercial or logistic businesses within the broader area. According to expert assessment, the overall scale of the proposed development and the low-interface-impacts with surrounding properties, demonstrates that the subject site can be developed for further data storage. This represents orderly development of the subject site as proposed under this SSD Application.
(d)	*to promote the delivery and maintenance of affordable housing,*
	Response: This objective is not applicable to the proposed development, as the proposal does not seek consent for housing.
(e)	*to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,*
	Response: Given that the site is has been subject to extensive works already, the proposed development would not have a significant impact on biodiversity values. A BDAR wavier has been granted, in accordance with Section 7.9 of the BC Act.
(f)	*to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),*
	Response: The following reports have been / are being prepared by Artefact, as required by the SEARS: ▪ Statement of Heritage Impact (SOHI) and Non-Aboriginal (Historic) Archaeological Assessment ▪ Aboriginal Cultural Heritage Assessment Report (ACHAR) It is noted that Artefact has commenced preparation of an ACHAR, with the process being undertaken in accordance with the *Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011) and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (OEH 2010).

TABLE 13: EP&A ACT OBJECTS	
Object	**Description**
	The consultation process has commenced and is ongoing. The results of this archaeological survey and research concluded that there are no Aboriginal sites in the study area and that there were no areas of potential archaeological deposit. It was concluded that the study has nil to low potential for Aboriginal objects, due to the disturbed nature of the site. A draft ACHAR has been prepared and forms part of **Appendix 30** of this EIS. Any feedback from Registered Aboriginal Parties (RAPs) will be incorporated into the report to produce the final report. It is anticipated that the final ACHAR will be sent out for review by the RAPs around 9/10 November 2021 and the closing date for comment from the RAPs would, in this case, be early December 2021. Once the review process is completed, all correspondence relating to the consultation will be appended to the final report and the ACHAR submitted. The findings of these reports conclude that: (1) No listed heritage items are to be impacted by the proposed works. (2) There is low potential that significant archaeological remains are present within the subject site. (3) There are no recorded Aboriginal sites located within the subject site. (4) The subject site landform has been modified and terraced and is therefore heavily disturbed. (5) There are no identified areas of Aboriginal archaeological sensitivity within the subject site. A copy of the final ACHAR will form part of the response to submissions of this SSD assessment process.
(g)	*to promote good design and amenity of the built environment,*
	Response: The vision of the proposed development is to create a quality built form with integrated landscaping. The proposed development is considered to promote both good design and improved amenity, through the use of new-age materials and innovative contemporary design. Colours proposed for the facades of the building are typical of this type of development with more muted recessive tones applied, that will transition well from the existing data centre. Particular emphasis has been placed on MDC branding, through transitioning of the colour and materials palette adopted in the Stage 1 development to ensure a cohesive campus. Envelope design has been developed to include a precast concrete and/or insulated sandwich panel facade (with decorative cladding). Areas of glazed façade are provided as part of the design development to permit natural light to selected areas without compromising the integrity of the data centre. A concrete roof (with waterproof membrane) has been provided with drainage to eaves gutters. The roof includes enclosed plant/pump rooms, as well as external areas for the mechanical plant. Consideration has been given to Council's requirements of building form, finish and articulation.
(h)	*to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants,*
	Response: The proposed development would be implemented through best-industry practice standards and measures. The proposal has been designed in accordance with the BCA, and the NCC. This incorporates into the design, all statutory and functional requirements of the BCA, regarding access, egress and fire, which are deemed necessary to safeguard the safety of building occupants and the longevity of the development.
(i)	*to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,*
	Response:

TABLE 13: EP&A ACT OBJECTS	
Object	**Description**
	The proposed development is considered to impact positively on other existing (and proposed) developments within the wider locality, which is further reinforced throughout the supporting specialist reports and the body of this EIS. Where possible impacts have been identified, appropriate management and mitigation measures have been applied accordingly. It is noted, that throughout the assessment process, relevant agencies have been consulted and provided opportunity to both assess the proposed development and provide comments. Community consultation has been conducted which has assisted to inform the final submitted design and reinforces compliance with this objective. This has included numerous Government agency meetings and notification letters to both Government agencies and all key stakeholders. Several meetings have been held with stakeholders, which are detailed further in **PART E** of this EIS.
(j)	*to provide increased opportunity for community participation in environmental planning and assessment.*
	Response: Community and stakeholder engagement has been undertaken for the proposed development. This has included meetings and notification letters to both agencies and all potentially-impacted stakeholders. A Community and Stakeholder Participation Strategy (located in **Appendix 5**) has been prepared by Astrolabe, in support of this SSD Application, offering a summary and analysis of all community and stakeholder consultation sessions, distilling into themes, and those items identified in the consultation process, as significant.

4.3.2 Environmental Planning and Assessment Regulation 2000

The EP&A Regulation is the EP&A Act's primary subordinate legislation and contains key operational provisions for the NSW planning system, including those relating to EIS'.

4.3.2.1 Schedule 1 – Forms

Pursuant to Schedule 1 of the EP&A Regulation, this EIS includes all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1, as detailed in TABLE 14.

TABLE 14: SCHEDULE 1 OF EP&A REGULATION	
Requirements	**Satisfied by**
Part 1 Development applications	
2 Documents to accompany development application	
(1) A development application must be accompanied by the following documents—	
(a) a site plan of the land,	Refer to **Appendix 7** of this EIS.
(b) a sketch of the development,	Refer to **Appendix 7** of this EIS.
(c) a statement of environmental effects (in the case of development other than designated development or State significant development),	Not applicable to this SSD Application.
(d) in the case of development that involves the erection of a building, an A4 plan of the building that indicates its height and external configuration, as erected, in relation to its site (as referred to in clause 56 of this Regulation),	Refer to **Appendix 7** of this EIS.
(e) an environmental impact statement (in the case of designated development or State significant development),	Refer to **whole EIS document**.
(f) a species impact statement (in the case of land that is, or is part of, critical habitat or development that is likely	Not applicable to this SSD Application.

TABLE 14: SCHEDULE 1 OF EP&A REGULATION	
Requirements	**Satisfied by**
to significantly affect threatened species, populations or ecological communities, or their habitats), but not if the development application is for State significant development,	
(g) if the development involves any subdivision work, preliminary engineering drawings of the work to be carried out,	Not applicable to this SSD Application.
(h) if an environmental planning instrument requires arrangements for any matter to have been made before development consent may be granted (such as arrangements for the provision of utility services), documentary evidence that such arrangements have been made,	Refer to **Section 6.1.20** of this EIS.
(i) if the development involves a change of use of a building (other than a dwelling-house or a building or structure that is ancillary to a dwelling-house and other than a temporary structure)— *(i) a list of the Category 1 fire safety provisions that currently apply to the existing building, and* *(ii) a list of the Category 1 fire safety provisions that are to apply to the building following its change of use,*	Not applicable to this SSD Application.
(j) if the development involves building work to alter, expand or rebuild an existing building, a scaled plan of the existing building,	Refer to **Appendix 7** of this EIS.
(k) if the land is within a wilderness area and is the subject of a wilderness protection agreement or conservation agreement within the meaning of the Wilderness Act 1987, a copy of the consent of the Minister for the Environment to the carrying out of the development,	Not applicable to this SSD Application.
(k1) in the case of development comprising mining for coal (within the meaning of section 380AA of the Mining Act 1992)—documentary evidence that the applicant holds an authority under the Mining Act 1992 in respect of coal and the land concerned or has the written consent of the holder of such an authority to make the development application,	Not applicable to this SSD Application.
(l) in the case of development to which clause 2A applies, such other documents as any BASIX certificate for the development requires to accompany the application,	Not applicable to this SSD Application.
(m) in the case of BASIX optional development—if the development application is accompanied by a BASIX certificate or BASIX certificates (despite there being no obligation under clause 2A for it to be so accompanied), such other documents as any BASIX certificate for the development requires to accompany the application,	Not applicable to this SSD Application.
(n) if the development involves the erection of a temporary structure, the following documents— *(i) documentation that specifies the live and dead loads the temporary structure is designed to meet,* *(ii) a list of any proposed fire safety measures to be provided in connection with the use of the temporary structure,* *(iii) in the case of a temporary structure proposed to be used as an entertainment venue—a statement as to how the performance requirements of Part B1*	Not applicable to this SSD Application.

TABLE 14: SCHEDULE 1 OF EP&A REGULATION	
Requirements	**Satisfied by**
and NSW Part H102 of Volume One of the Building Code of Australia are to be complied with (if a performance solution, to meet the performance requirements, is to be used), *(iv) documentation describing any accredited building product or system sought to be relied on for the purposes of section 4.15(4) of the Act,* *(v) copies of any compliance certificates to be relied on,*	

4.3.2.2 Schedule 2 – Environmental Impact Statements

This EIS has been prepared in accordance with clauses 6 and 7 of Schedule 2, as detailed in TABLE 15.

TABLE 15: SCHEDULE 2 OF EP&A REGULATION	
Requirements	**Satisfied by**
General Provisions	
6 Form of environmental impact statement	
(1) An environmental impact statement must contain the following information—	
(a) the name, address and professional qualifications of the person by whom the statement is prepared,	Refer to **page ii** of this EIS.
(b) the name and address of the responsible person,	Refer to **page ii** of this EIS.
(c) the address of the land— *(i) in respect of which the development application is to be made, or* *(ii) on which the activity or infrastructure to which the statement relates is to be carried out,*	Refer to **Section 2.1** of this EIS.
(d) a description of the development, activity or infrastructure to which the statement relates,	Refer to **Section 3.2** of this EIS.
(e) an assessment by the person by whom the statement is prepared of the environmental impact of the development, activity or infrastructure to which the statement relates, dealing with the matters referred to in this Schedule,	Refer to **PART F** of this EIS.
(f) a declaration by the person by whom the statement is prepared to the effect that— *(i) the statement has been prepared in accordance with this Schedule, and* *(ii) the statement contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure to which the statement relates, and* *(iii) that the information contained in the statement is neither false nor misleading.*	Refer to **page ii** and of this EIS.
(2) The person preparing the statement must have regard to the following— *(a) for State significant development—State Significant Development Guidelines,* *(b) for State significant infrastructure—State Significant Infrastructure Guidelines.*	The preparation of this EIS has given regard to *the State Significant Development Guidelines.*
7 Content of environmental impact statement	

TABLE 15: SCHEDULE 2 OF EP&A REGULATION	
Requirements	**Satisfied by**
(1) An environmental impact statement must also include each of the following—	
(a) a summary of the environmental impact statement,	Refer to **page 1** of this EIS.
(b) a statement of the objectives of the development, activity or infrastructure,	Refer to **Section 3.1** of this EIS.
(c) an analysis of any feasible alternatives to the carrying out of the development, activity or infrastructure, having regard to its objectives, including the consequences of not carrying out the development, activity or infrastructure,	Refer to **Section 3.4** of this EIS.
(d) an analysis of the development, activity or infrastructure, including—	
(i) a full description of the development, activity or infrastructure, and	Refer to **Section 3.2** of this EIS.
(ii) a general description of the environment likely to be affected by the development, activity or infrastructure, together with a detailed description of those aspects of the environment that are likely to be significantly affected, and	Refer to **PART B** and **PART F** of this EIS.
(iii) the likely impact on the environment of the development, activity or infrastructure, and	Refer to **PART F** of this EIS.
(iv) a full description of the measures proposed to mitigate any adverse effects of the development, activity or infrastructure on the environment, and	Refer to **PART G** of this EIS.
(v) a list of any approvals that must be obtained under any other Act or law before the development, activity or infrastructure may lawfully be carried out,	Refer to **PART D** of this EIS.
(e) a compilation (in a single section of the environmental impact statement) of the measures referred to in item (d)(iv),	Refer to **PART G** of this EIS.
(f) the reasons justifying the carrying out of the development, activity or infrastructure in the manner proposed, having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development set out in subclause (4).	Refer to **PART H** of this EIS.
(2) Subclause (1) is subject to the environmental assessment requirements that relate to the environmental impact statement.	Refer to **Section 1.5** of this EIS.
(3) Subclause (1) does not apply if— *(a) the Planning Secretary has waived (under clause 3(9)) the need for an application for environmental assessment requirements in relation to an environmental impact statement in respect of State significant development, and* *(b) the conditions of that waiver specify that the environmental impact statement must instead comply with requirements set out or referred to in those conditions.*	Not applicable.
(4) The principles of ecologically sustainable development are as follows— *(a) the 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*	Refer to **Section 8.1.5** of this EIS.

TABLE 15: SCHEDULE 2 OF EP&A REGULATION	
Requirements	**Satisfied by**
precautionary principle, public and private decisions should be guided by— *(i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and* *(ii) an assessment of the risk-weighted consequences of various options,* *(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,* *(c) conservation of biological diversity and ecological integrity, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,* *(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.*	

4.3.2.3 Schedule 3 – Designated Development

Section 4(1) of the EP&A Regulation states, that any development described in Part 1 of Schedule 3, would be declared to be Designated Development for the purposes of the EP&A Act.

The proposal, being for an expansion of an existing data centre does not trigger any threshold under Schedule 3 of the EP&A Regulation, therefore is not considered Designated Development.

4.3.3 Protection of the Environment Operations Act 1997

Another important item of legislation, against which this proposal has been assessed, is the *Protection of the Environment Operations Act 1979* (POEO Act). Schedule 1 of the POEO Act contains a core list of activities that require a licence before they may be undertaken or carried out. The definition of an 'activity' for the purposes of the POEO Act is:

> *"an industrial, agricultural or commercial activity or an activity of any other nature whatever (including the keeping of a substance or an animal)."*

4.3.3.1 Schedule 1 – Clause 9(1) – Petroleum products storage

Under the POEO Act, Schedule 1, Clause 9(1) 'petroleum products storage', which would include diesel fuel storage, is a Scheduled Activity. Capacity to store greater than 2,000 tonnes requires an EPL from the NSW EPA.

Under the current design, the proposed diesel fuel storage capacity at 540 tonnes is not expected to require an EPL.

4.3.3.2 Schedule 1 – Clause 17 – Electricity generation

Clause 17 'electricity generation' applies to electricity works (wind farms), general electricity works, metropolitan electricity works (gas turbines) and metropolitan electricity works (internal combustion engines). Clause 17 does not apply to the generation of electricity by means of electricity plant that is emergency stand-by plant operating for less than 200 hours per year. Given the total testing time of the stand by generators is less than 200 hours per year the proposal is not classified as a scheduled activity.

The total testing time for all generators is 132 hours per annum (based on 1 generator per test); refer to **Section 6.1.4.4** of this EIS for a detailed assessment.

4.3.4 Protection of the Environment Operations (Clean Air) Regulation 2010

The *Protection of the Environment Operations (Clean Air) Regulation 2010* (POEO (Clean Air) Regulation) is the core regulatory instrument for air quality issues in NSW. In relation to industry, it:

- sets maximum limits on emissions from activities and plant for a number of substances
- deals with the transport and storage of volatile organic liquids
- restricts the use of high sulphur liquid fuel
- imposes operational requirements for certain afterburners, flares, vapour recovery units and other treatment plant.

The POEO (Clean Air) Regulation exempts emergency standby plant (comprising a stationary reciprocating internal combustion engine) for generating electricity from the air impurities standard for NO2 and NO specified in Schedule 4 relevant to that plant if the plant is used for a total of not more than 200 hours per year.

As outlined in **Section 6.1.4** of this EIS, each generator (plant) is proposed to be operated for 12 hours per year for the purposes of testing. While generators will be required to operate for the purpose of electricity generation during major power interruptions. Such events would only occur very infrequently and for a limited time period. Therefore, it is anticipated that the plant would be required to operate for a total of less than 200 hours per year. As such the proposal is exempt from the concentration limits outlined in POEO (Clean Air) Regulation.

4.3.5 Biodiversity Conservation Act 2016

The BC Act is the key legislation in NSW, relating to the protection and management of biodiversity and threatened species. The purpose of the BC Act is to "maintain a healthy, productive and resilient environment, for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development". The BC Act is supported by a number of regulations, including the *Biodiversity Conservation Regulation 2017* (BC Regulation).

Under section 7.9(2) of the BC Act, the NSW DPIE has determined that the proposed development is not likely to have any significant impact on biodiversity values and that a BDAR is not required to accompany any application for development consent for the proposed development; refer to **Appendix 29** of this EIS.

4.3.6 State Environmental Planning Policy (State and Regional Development) 2011

The SRD SEPP identifies development that is SSD, State significant infrastructure and critical State significant infrastructure, and regionally significant development.

Proposed developments that are listed in Schedule 1 of SRD SEPP are identified as being SSD.

Clause 25 of Schedule 1 of SRD SEPP states:

> ***25 Data storage***

(1) Development for the purpose of storage premises used for the storage of data and related information technology hardware that has a total power consumption of more than the relevant amount.

(2) In this clause—

relevant amount means—
(a) for development in relation to which the relevant environmental assessment requirements are notified under the Act on or before 31 May 2023—10 megawatts, or
(b) for any other development—15 megawatts.

The proposed development (being the expansion capacity) has a total power consumption capacity of up to 33 MW. As the proposal exceeds the 10 MW statutory threshold and meets all other criteria in SRD SEPP, it is deemed and categorised as SSD.

4.3.7 State Environmental Planning Policy (Infrastructure) 2007

The ISEPP aims to facilitate the effective delivery of infrastructure across the State. In accordance with the meaning bestowed under the ISEPP, a data centre is defined as "development for the purposes of storage premises used for the storage of data and related information technology hardware".

4.3.7.1 Division 3 – Data storage

Pursuant to Clause 27 of the ISEPP, development for the purpose of storage premises used for the storage of data and related information technology hardware may be carried out by any person with consent on land in a prescribed zone.

The B7 Business Park zone is identified as a 'prescribed zone' pursuant to Part 3, Division 3, Clause 27(2) of the ISEPP.

As such, despite the prohibition of the RLEP2014, the proposed data centre expansion is permissible with consent, in accordance with the ISEPP.

4.3.8 State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

SEPP 33 provides for determining whether a development is potentially hazardous of offensive industry, and any measures proposed to be employed to reduce the impact of the development.

SLR Consulting have prepared a Preliminary Risk Screening Report (**Appendix 18**), in accordance with SEPP 33, to provide a screening assessment of the hazards associated with the storage of any DGs. Where SEPP 33 identifies a development as potentially hazardous and/or offensive, developments are required to undertake a Preliminary Hazard Analysis (PHA) to determine the level of risk to people, property and the environment at the proposed location and in the presence of controls.

If the risk levels exceed the criteria of acceptability and/or if the controls are assessed as inadequate, or unable to be readily controlled, then the development is classified as 'hazardous industry'. Where it is unable to prevent offensive impacts on the surrounding land users, the development is classified as 'offensive industry'.

A development may also be considered potentially hazardous with respect to the transport of dangerous goods. A proposed development may be potentially hazardous if the number of generated traffic movements (for significant quantities of hazardous materials entering or leaving the site) is above the cumulative annual or peak weekly vehicle movements.

The SEPP 33 – Preliminary Risk Screening Report presents information pertaining to the presence of any hazardous materials, flammable substances, and compressed or liquefied gases proposed to be stored or handled in relation to the proposed development, including on site storage, or transported to or from the site.

4.3.8.1 Materials storage

No DGs will be required for the operation of the subject site.

The only potentially hazardous material associated with the facility will be diesel fuel for the back-up generators. The total generators for the site will be 34, situated both the existing IC2 and IC3e (16 generators) and proposed IC3w (18 generators). The fuel on the site is made up of the bulk fuel capacity plus the capacity in the generator day tanks for both the existing IC2 and proposed IC3w. The total site bulk fuel storage is 638,400 L.

Diesel fuel storage shall be limited to generator day tanks and the bulk fuel storage systems. The breakdown of this storage requirements has been set out in **TABLE 16** below.

TABLE 16: DIESEL FUEL STORAGE REQUIREMENTS				
Diesel Tanks	**IC3w (proposed)**	**IC3e (existing)**	**IC2 (existing)**	**Total**
Bulk tank capacity (L)	100,000	60,000	90,000	-
No. bulks tanks	4	1	1	-
Total bulk tank capacity (L)	400,000	60,000	90,000	550,000
Local day tank capacity (L)	1,000	7,800	1,000	-
No. local day tanks	18	8	8	-
Total day tank capacity (L)	18,000	62,400	8,000	78,400
Total capacity (L)	**418,000**	**122,400**	**98,000**	**638,400**

The proposal also includes the storage of lithium-ion batteries, a Class 9 miscellaneous dangerous substances and articles, however such substances/articles are excluded from the SEPP 33 screening process. Notwithstanding, the estimated quantity of 273,600 kg exceeds the SafeWork NSW manifest quantity, therefore SafeWork NSW must be notified – refer to **TABLE 11**.

Hazards (fire) associated with these lithium ion batteries are covered by a separate Fire Safety Strategy Report, prepared by Innova Fire Safety Specialists, and contained within **Appendix 19** of this EIS. The scope and findings of the Fire Risk Strategy Report are included within **Section 6.1.8** below.

4.3.8.2 Preliminary screening

Preliminary risk screening of the proposed development is required under SEPP 33 to determine the need for a PHA. The preliminary screening assesses the storage of specific DGs classes that have the potential for significant, off-site effects. Specifically, the assessment involves the identification of classes and quantities of all DGs to be used, stored or produced on site with respect to storage depot locations as well as transported to and from the site.

There are no DGs to be used or stored at the facility and there will be no transport of DGs associated with the facility, therefore the facility is not considered potentially hazardous with regards to DGs in accordance with the thresholds pertaining to SEPP 33.

Diesel fuel:

Diesel fuel to be stored on site, is not classed as a DGs, but is classed as a C1 Combustible Liquid provided no flammable liquids are stored with the diesel.

Note that C1 combustible liquids are not a DGs under UN classification. However, they are defined as DGs under NSW workplace legislation. Where DGs are used or stored in volumes greater than the manifest quantities specified in schedule 11 of the *Work Health and Safety Regulation 2017*, SafeWork NSW must be notified, which will include manifests and lodgement an emergency plan to Fire and Rescue NSW.

Lithium-ion batteries:

Lithium-ion batteries are Class 9 Miscellaneous dangerous substances and articles, which are excluded from the SEPP 33 screening process. Hazards associated with these lithium-ion batteries relate to fires and therefore are covered in the Fire Risk Study Report for the development, as detailed above.

In the proposed development, lithium-ion batteries will be contained in Vision Revo Le TP200 Battery cabinets. Estimates of total quantity of lithium-ion batteries are based on the weight of cabinets (900 kg) and 304 cabinets in IC3w. This gives an estimate of total quantity of lithium-ion batteries as 273,600 kg for IC3w. The existing IC2 and IC3e do not have lithium-ion batteries. Note this is likely to be an overestimate as the supplier details do not specify weight of lithium and therefore the total weight may include non-lithium components, such as wire, frames, etc.

The estimated quantity of lithium-ion batteries exceeds the SafeWork NSW manifest quantity, as such SafeWork NSW must be notified.

Hazards associated with these lithium ion batteries related to fires were to be covered in a separate Fire Safety Strategy Report for the development; refer to **Appendix 19** and **Section 6.1.8** of this EIS for further detail.

4.3.9 State Environmental Planning Policy No. 55 – Remediation of Land

Under the provisions of *State Environmental Planning Policy No. 55 – Remediation of Land* (SEPP 55), where a development application is made concerning land that is contaminated, the consent authority must not grant consent unless:

(a) it has considered whether the land is contaminated, and
(b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or would be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and
(c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land would be remediated before the land is used for that purpose.

A Detailed Site Investigation (DSI) Addendum has been prepared by ERM Services (**Appendix 22**) to supplement the findings of a previous DSI issued by DLA Environmental Services in April 2018 (DLA, 2018). The DSI Addendum investigates and documents the potential contamination of the subject site, assesses the suitability of the site for the proposed use (or make recommendations to enable such a use to occur).

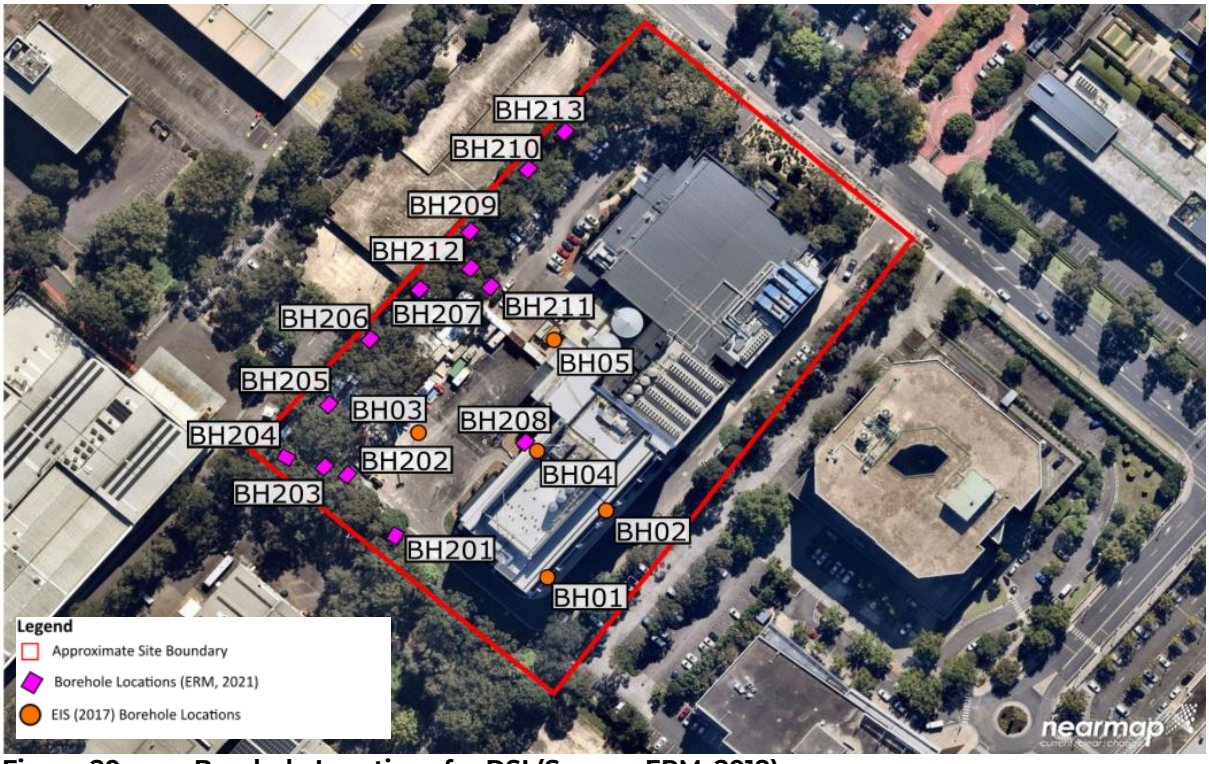


Figure 20 Borehole Locations for DSI (Source: ERM, 2018)

Based on the findings of their investigations, ERM Services have concluded the following:

- The site can be made suitable for the intended land use, consistent with 'Commercial / Industrial' as defined in the National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1) ('NEPM', NEPC, 2013), following the excavation, classification and disposal of asbestos impacted fill materials from location BH207_0.3 (refer below).
- If any unexpected finds of potentially contaminated material is uncovered during excavation, or material observed to be different to the material described in the DSI Addendum report is encountered, then these materials should be excavated separately and assessed by a contaminated land professional.

4.4 STRATEGIC PLANNING CONTEXT

4.4.1 Greater Sydney Region Plan – A Metropolis of Three Cities

The *Greater Sydney Region Plan – A Metropolis of Three Cities* divides the Sydney Region into three (3) Cities, with a vision of growth until 2056. The Plan aims to anticipate the housing and employment needs of a growing and vastly changing population. The overall vision pursues an objective of transforming 'Greater Sydney' into a Metropolis of Three Cities, including:

- The Western Parkland City;
- The Central River City; and
- The Eastern Harbour City.

The division into three cities puts workers and the wider community closer to an array of characteristics such as, intensive jobs, 'city-scale' infrastructure and services, entertainment and cultural facilities. By managing and retaining industrial land close to city centres and transport, this will ensure critical and essential services are readily available to support local businesses and community members and residents. Once constructed and operational, the subject site would achieve economic growth and prosperity, as well as encourage employment-generating opportunities within an area zoned for such permissible purposes, that is considered relatively close in conjunction to residential communities, providing an ease of commute. The proposed development across the site considers the employment-generating outcomes that can be achieved for the immediate and wider localities.

The proposed development also contributes to the four (4) standardised elements communicated across for all three (3) cities, including:

- Infrastructure and collaboration – the proposed development of the site for the purposes of a data centre, would facilitate the provision of services to support the wider locality and region;
- Liveability – the proposed development encourages employment-generating opportunities and economic prosperity, which has positive influences on the wider locality;
- Productivity – the proposed development is situated within the *Northern City District Plan* (refer to **Section 5.3** below); and,
- Sustainability – the proposed development would not exhibit or emit any detrimental impacts to its wider ecological surroundings.

In summary, the subject site and proposed development contributes to the objectives set out in the *Greater Sydney Region Plan – A Metropolis of Three Cities* by promoting minor environmental impacts and the further promotion of technological advancements and employment-generating opportunities to the wider locality and community, positioned within the City of Ryde LGA.

4.4.2 North District Plan

The subject site forms part of the Northern City District, as identified in **Figure 21** below and is subject to the provisions of the North District Plan.

Figure 21 Structure Plan for the North District Plan (Source: Greater Sydney Commission, 2018)

The strategic importance of the subject site, Macquarie Park and the Eastern Economic Corridor to the regional and national economy is outlined in the North District Plan. Macquarie Park is identified as a strategic centre and health and innovation precinct, anticipated to support between 73,000 (baseline target) and 79,000 (higher target) jobs by 2036 (an additional 15,000-19,000 jobs on 2016 estimates). Outcomes supported by this proposal are consistent with the strategic direction of A Metropolis of Three Cities and the North District Plan. The proposed development aligns with the following planning priorities of the North District Plan:

- N8: Eastern Economic Corridor is better connected and more competitive: The Eastern Economic Corridor extends from Macquarie Park to Sydney Airport, containing close to a third of Greater Sydney's jobs. The proposal would contribute to further job creation in this respect.
- N9: Growing and investing in health and education precincts: The proposed data centre expansion at the subject site supports the growth of the Macquarie Park Corridor, which is intended as a hospital and high-tech industrial employment hub.
- N10: Growing investment, business opportunities and jobs in strategic centres: The proposed data centre expansion supports improved access to jobs, goods and services in the Macquarie Park strategic centre.
- N13: Supporting growth of targeted industry sectors: Increased data storage capacity would enable economic opportunities created by changing technologies, embracing opportunities to expand start-up and digital innovation that can allow people to work closer to home.

Importantly, the proposed development would provide data storage solutions for both public and private cloud, not just public cloud. This enables the proposal to support services for multinational corporations that require their own private hosting solutions, as well as Tier 1 Government agencies. Emerging digital technology (including cybersecurity, AI and quantum computing) is a priority industry to achieve Global NSW's vision for a globally connected, smart and vibrant economy.

Further, the NSW Government has states that 'each data centre development directly contributes as much as $1 billion in construction and fit-out costs to the NSW economy and forms critical infrastructure for the IT sector', emphasising the importance of these investments towards economic stimulus.

The need for data centres was given a burning platform by changes to business as usual catalysed by COVID-19. The NSW DPIE recognises data centres as a type of development 'well-placed' to support short-term economic recovery from COVID-19. Data centres were included as one infrastructure asset

encouraging investment and job-generating development in DPIE's Productivity Acceleration Package. This relative importance is reflected in amendments to the SRD SEPP, which temporarily allows greater scope for warehouses and data centres to be assessed as SSD.

4.4.3 Future Transport Strategy 2056

The Future Transport Strategy 2056 is a 40 year strategy, supported by plans for regional NSW and for Greater Sydney. The strategy and plans focus on the role of transport in delivering movement and place outcomes that support the character of the places and communities we want for the future.

The proposed development aligns with the strategies of Future Transport on the following basis:

- the site has access to regular public transport services;
- the site is accessible by active transport;
- a travel demand management approach is proposed through implementation of a work place travel plan;
- parking provision is appropriate;
- access, servicing and internal layout will be provided in accordance with Australian Standards AS2890.1-2004 and AS2890.2-2018;
- the surrounding road network and intersections will be able to cater for the proposed development traffic.

4.5 LOCAL PLANNING CONTEXT

4.5.1 Ryde Local Environmental Plan 2014

RLEP2014 is the principal EPI that applies to the subject site, within which the subject site is zoned B7 Business Park (**Figure 22**).

Whilst the permissibility of the proposal, being development for the purposes of storage premises used for the storage of data and related information technology hardware, can be achieved under the ISEPP, the development standards of the RLEP2014 continue to apply.

4.5.1.1 Zone objectives

The subject site is zoned B7 Business Park under the RLEP2014 (as shown in **Figure 22** below), which adopts the following objectives:

- *To provide a range of office and light industrial uses*
- *To encourage employment opportunities*
- *To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area*
- *To encourage industries involved in research and development.*

Whilst it has been established that the proposal is permissible with consent in the B7 Business Park zone, pursuant to the Clause 27 of the ISEPP, the proposal should also be considered against the objectives of the B7 Business Park zone.

The proposal is considered consistent with the zoning, based on the following:

- It would provide additional employment opportunities during both and construction and operation of the data centre;
- It would provide a complimentary service offering to Macquarie Business Park, including the wider IT sector;
- It would support research and development through the secure storage of IT data for both private and public organisations.

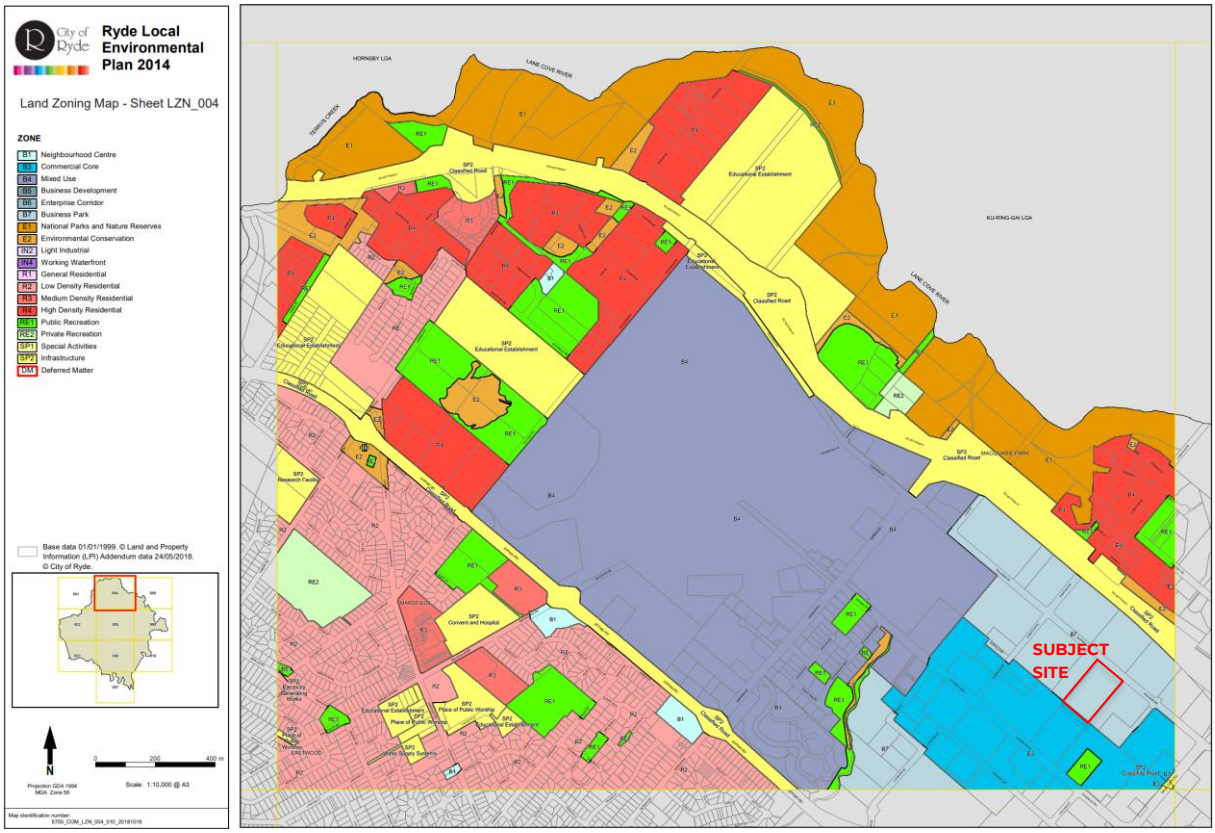


Figure 22 Land Zoning Map (Source: NSW Legislation, 2021)

4.5.1.2 Development standards

TABLE 17 outlines the consistency and compliance of the proposal with the relevant development standards and controls under RLEP2014.

TABLE 17: DEVELOPMENT STANDARDS – RLEP2014	
Clause	**Comment**
Principal development standards	
Clause 4.1 – Minimum subdivision lot size	Not applicable to the proposed development.
Clause 4.3 – Height of buildings	The subject site is mapped (pursuant to map sheet HOB_004) to have a maximum building height of 9m in the southern (rear) portion of the site and 30m in remaining portion of the site – refer to **Figure 23**. However, pursuant to Clause 6.9 of the RLEP2014, the subject site is afforded bonus incentives pertaining to building height and FSR – refer to Clause 6.9 within **TABLE 17**.
Clause 4.4 – Floor space ratio	The subject site is mapped (pursuant to map sheet FSR_004) to have a maximum FSR of 1:1 across the whole site – refer to **Figure 24**. However, pursuant to Clause 6.9 of the RLEP2014, the subject site is afforded bonus incentives pertaining to building height and FSR – refer to Clause 6.9 within **TABLE 17**.
Clause 4.5B – Macquarie Park Corridor	The objectives for development on land in Zone B7 Business Park within the Macquarie Park Corridor are as follows— *(a) to provide for the daily convenience needs of employees and visitors,* *(b) to ensure that development supports the needs of businesses and organisations in the area.*

TABLE 17: DEVELOPMENT STANDARDS – RLEP2014	
Clause	**Comment**
	It is noted that the proposal does not seek consent for any use listed under Clause 4.5B(4) or 4.5B(5).
Clause 4.6 – Exceptions to development standards	Where variations to development standards are sought, Clause 4.6 offers a mechanism to vary such development standards. However, pursuant to Subclause 4.6(8)(cc), a Clause 4.6 Variation Request cannot be pursued for development that invokes the bonus incentives under Clause 6.9 of RLEP2014. As such, the proposed development does not exceed 45m in height, or an FSR of 2:1 – refer Clause 6.9 within **TABLE 17**.
Miscellaneous provisions	
Clause 5.21 – Flood planning	Pursuant to Clause 5.21 of the RLEP2014, the consent authority must be satisfied that the development — *(a) is compatible with the flood function and behaviour on the land, and* *(b) will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties, and* *(c) will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood, and* *(d) incorporates appropriate measures to manage risk to life in the event of a flood, and* *(e) will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.* A detailed flood study has been prepared and is presented herein. The study has been prepared, by Northrop Consulting Engineers, based on a previous approved development assessment using Council's adopted flood study – namely the Macquarie Catchment Flood Risk Management Study and Plan (Bewsher, 2011). The results presented in **Section 6.1.11** of this EIS suggest the proposed development is not expected to have a significant adverse impact on the subject site or in adjacent properties.
Additional local provisions	
Clause 6.2 – Earthworks	The proposal involves minor earthworks to be undertaken at the site. The proposed earthworks are considered to comply with the requirements of Clause 6.2 – refer to **Appendix 24** of this EIS.
Clause 6.4 – Stormwater management	Clause 6.4 of the RLEP2014 applies to all land in residential, business and industrial zones, requiring the consent authority to be satisfied that the development — *(a) is designed to maximise the use of water permeable surfaces on the land having regard to the soil characteristics affecting on-site infiltration of water, and* *(b) includes, if practicable, on-site stormwater retention for use as an alternative supply to mains water, groundwater or river water, and* *(c) avoids any significant adverse impacts of stormwater runoff on adjoining properties, native bushland and receiving waters, or if that impact*

<table>
<tr><th colspan="2">TABLE 17: DEVELOPMENT STANDARDS – RLEP2014</th></tr>
<tr><th>Clause</th><th>Comment</th></tr>
<tr><td></td><td>cannot be reasonably avoided, minimises and mitigates the impact.
A detailed assessment of site stormwater arrangements is included within Section 6.1.9 of this EIS.</td></tr>
<tr><td>Clause 6.6 – Environmental sustainability</td><td>Proposed development, for the purposes of a data centre, incorporates a number of ESD initiatives to reduce the consumption of potable water and greenhouse gas emissions of the future operations. Initiatives relate to:
Indoor environmental quality;
Potable water reduction;
Heat island effect;
Energy and greenhouse gas emissions reduction;
Minimising waste to landfill;
Land use and ecology;
Environmental and building management.
Refer to Section 6.1.13 of this EIS for further detail.</td></tr>
<tr><td>Clause 6.9 – Development in the Macquarie Park Corridor</td><td>The subject site is mapped (pursuant to map sheet MPC_004) as within Precinct 01 – Macquarie Park – refer to Figure 25.
The objective of Clause 6.9 is to encourage additional commercial development in the Macquarie Park Corridor. By application of Clause 6.9, the subject site is afforded bonus incentives for building height and FSR – refer to Figure 26 and Figure 27.
A summary of the incentives and how they have been applied includes:
<table>
<tr><th>Development control</th><th>Development standard</th><th>Incentive provision</th><th>Proposal</th></tr>
<tr><td>Height</td><td>9m – rear of site
30m – front of site</td><td>45m</td><td>45m</td></tr>
<tr><td>FSR</td><td>1:1</td><td>2:1</td><td>1.02:1</td></tr>
</table>
To achieve such parameters, the proponent intends to enter into a Voluntary Planning Agreement (VPA) with the City of Ryde Council.
Discussion have been ongoing with the City of Ryde Council regarding the provision of a VPA under the subject SSD Application.
To invoke the provisions under Clause 6.9 of RLEP 2014 and achieve a 45m height limit, MDC propose to enter into a VPA with the City of Ryde Council.
It is noted that a VPA was executed under LDA2018/0322 between the abovementioned parties, and any new VPA for the subject SSD would seek to obtain a credit where there have already been monies paid relevant to the proposal. The monetary rate would be in the order of $275 per square metre and MDC may also seek to pay Section 7.11 contributions as part of any new VPA.
The terms of the VPA and the draft offer are yet to be finalised. Any future arrangement regarding this matter will be documented and reported to NSW DPIE as part of the SSD assessment process.</td></tr>
</table>

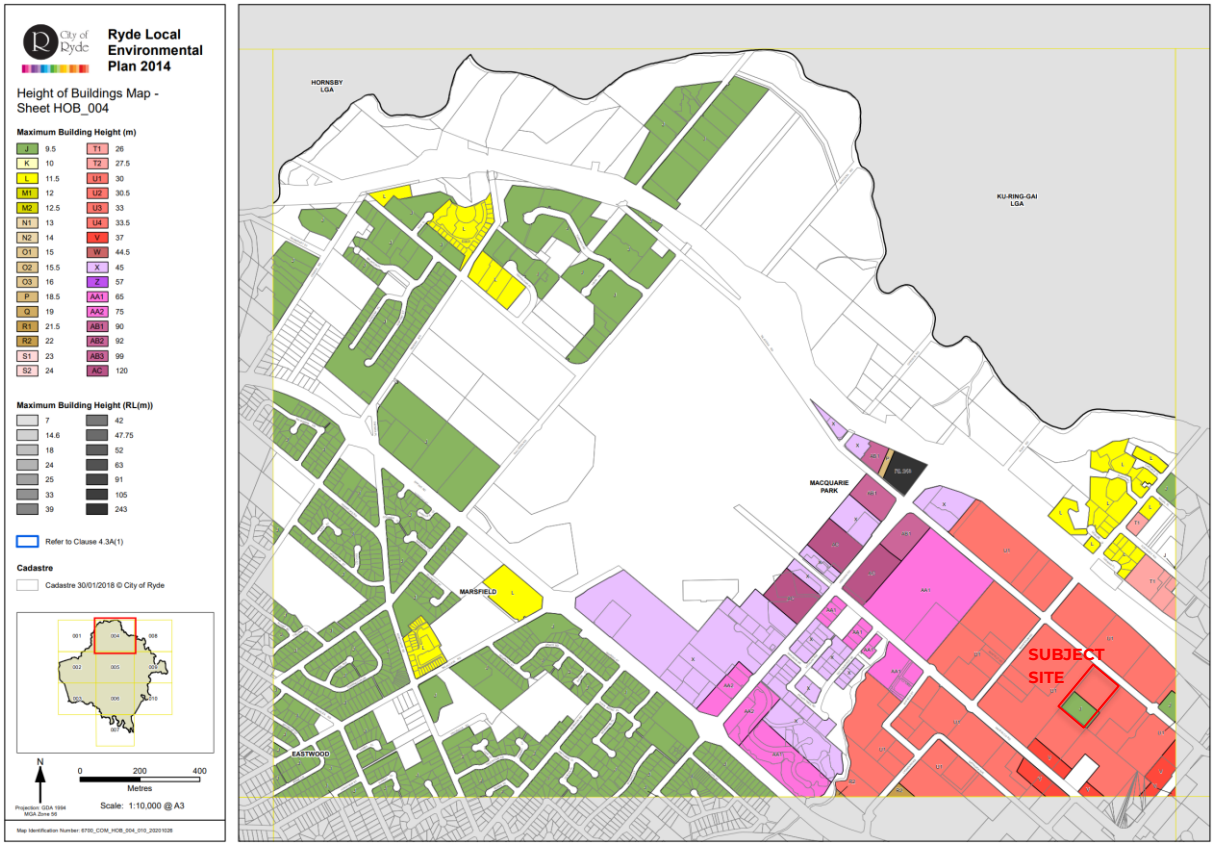


Figure 23 **Height of Buildings Map (Source: NSW Legislation, 2021)**

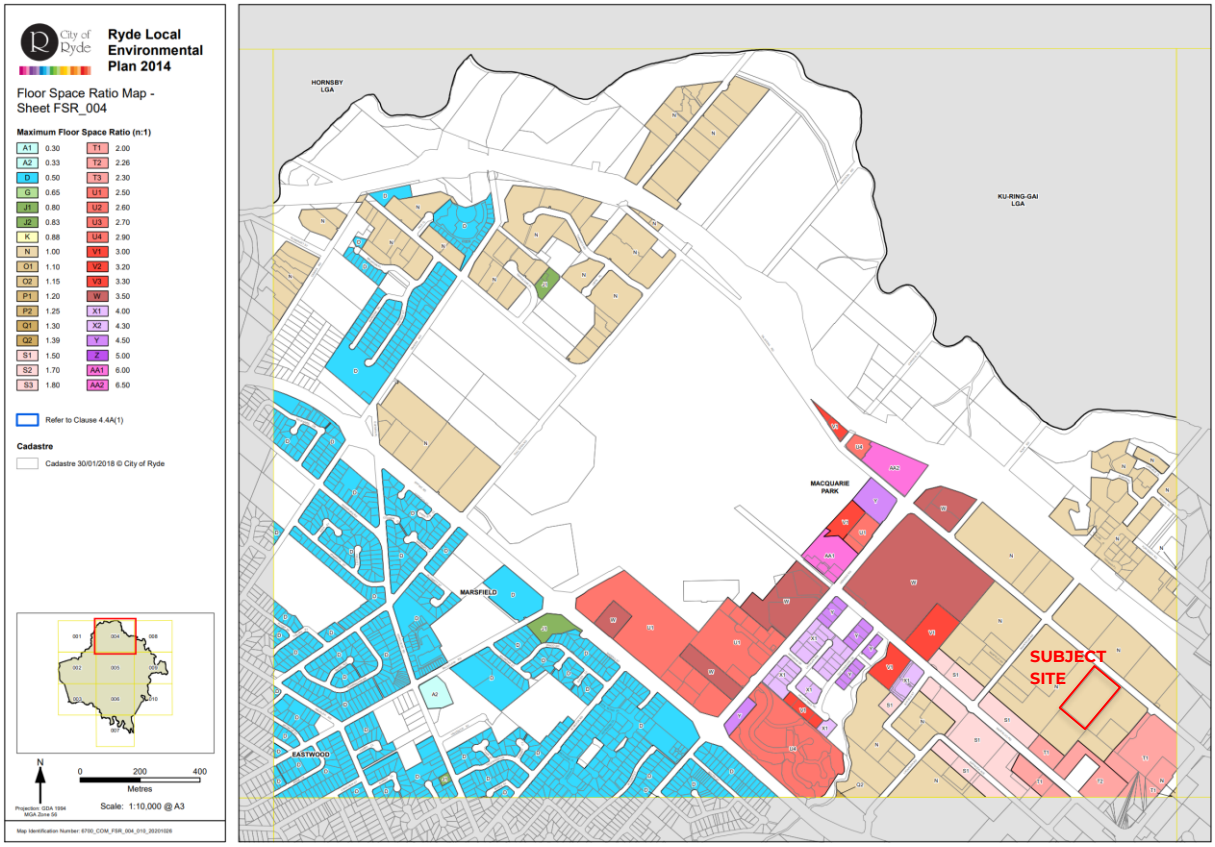


Figure 24 **Floor Space Ratio Map (Source: NSW Legislation, 2021)**

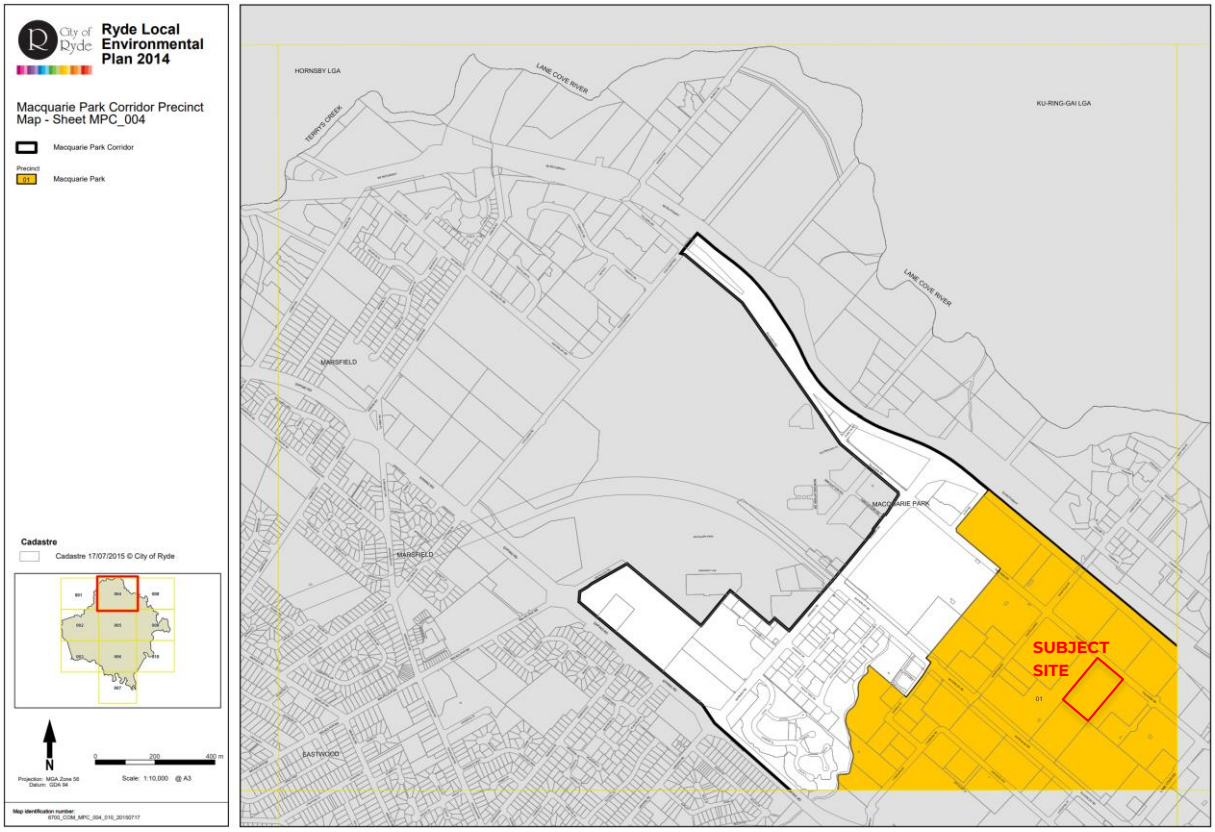


Figure 25 Macquarie Park Corridor Precinct Map (Source: NSW Legislation, 2021

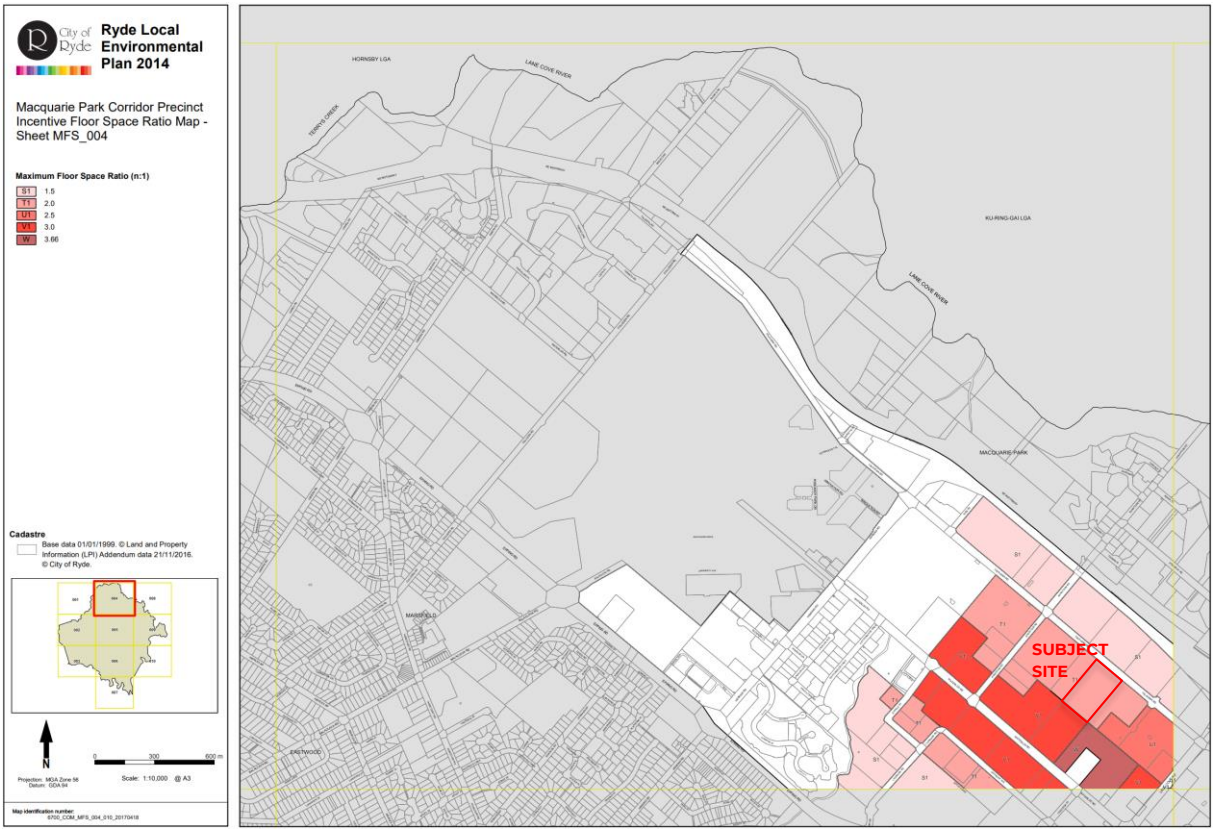


Figure 26 Macquarie Park Corridor Precinct Incentive FSR Map (Source: NSW Legislation, 2021

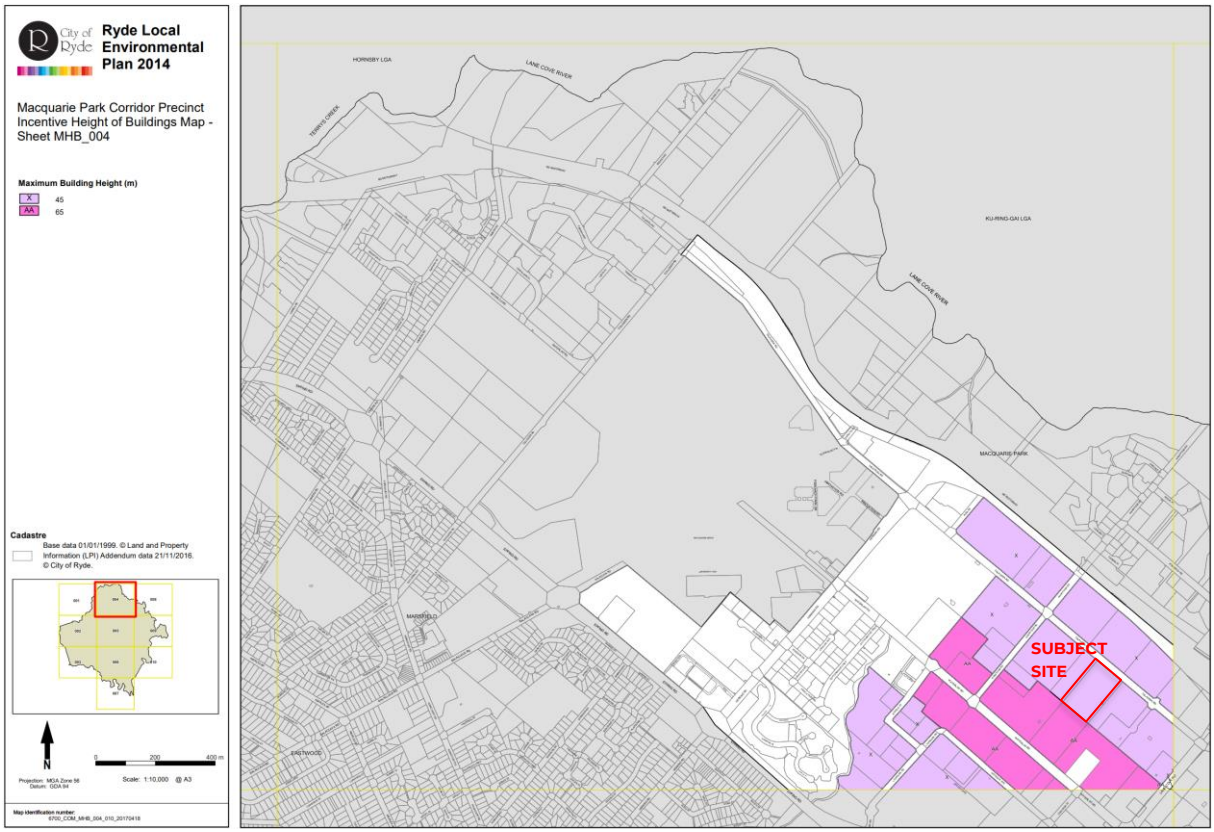


Figure 27 Macquarie Park Corridor Precinct Incentive Height of Buildings Map (Source: NSW Legislation, 2021

4.5.2 Ryde Development Control Plan 2014

The *Ryde Development Control Plan 2014* (RDCP2014) provides a non-statutory instrument to guide development in the City of Ryde LGA.

The aims and objectives of the RDCP2014 are as follows:

- *To achieve a responsible development control system that has sustainable environmental outcomes;*
- *To enhance the existing amenity and character of the City of Ryde;*
- *To create vibrant, viable and economically sound employment and living centres;*
- *To ensure new development is appropriate for its site and context;*
- *To ensure that urban centres and special areas are identified and their special qualities protected and enhanced;*
- *To provide guidelines for specific development types and development sites to ensure appropriate high quality development.*

The proposed development has considered the RDCP2014, which contains controls relevant to the subject site. Such controls, as they relate to the proposed development are outlined within **TABLE 18** below, which have been considered for consistency and completeness, despite DCP's not applying to SSD, pursuant to Clause 11 of SRD SEPP.

TABLE 18: DEVELOPMENT CONTROLS – RDCP2014	
Control	**Comment**
Macquarie Park Corridor	
Streets:	The subject site adjoins two (2) proposed new roads, as shown on Figure 4.1.1 of the RDCP2014: ▪ Proposed new 14m road to the south-east of the subject site (outside it's boundary)

<table>
<tr><th colspan="2">TABLE 18: DEVELOPMENT CONTROLS – RDCP2014</th></tr>
<tr><th>Control</th><th>Comment</th></tr>
<tr><td></td><td>▪ Proposed new 20m road to the south (rear) of the subject site (outside it's boundary)
In accordance with the RDCP2014, the proposed buildings are suitably setback from the proposed roads.</td></tr>
<tr><td>Parking:</td><td>The RDCP2014 states that for a new floor space in non-residential land uses, a maximum of 1 space per 60m^2 can be applied. For an additional floor space of 9,097m^2, a <u>maximum</u> of 151 additional spaces is permitted.
The previous development was approved with 71 on-site car parking spaces. It proposed to maintain the previously approved 71 car parking spaces. Hence, no additional car parking spaces will be proposed on site as part of the proposed expansion.
It is noted that RDCP2014 car parking requirement is set at maximum rates, hence the proposed car parking provision complies with the RDCP2014.</td></tr>
<tr><td>Planning incentives:</td><td>Discussion have been ongoing with the City of Ryde Council regarding the provision of a VPA under the subject SSD Application.
To invoke the provisions under Clause 6.9 of RLEP 2014 and achieve a 45m height limit, MDC propose to enter into a VPA with the City of Ryde Council.
It is noted that a VPA was executed under LDA2018/0322 between the abovementioned parties, and any new VPA for the subject SSD would seek to obtain a credit where there have already been monies paid relevant to the proposal. The monetary rate would be in the order of $275 per square metre and MDC may also seek to pay Section 7.11 contributions as part of any new VPA.
The terms of the VPA and the draft offer are yet to be finalised. Any future arrangement regarding this matter will be documented and reported to NSW DPIE as part of the SSD assessment process.</td></tr>
<tr><td>Built form:</td><td>The proposed development, being an extension of the existing built form, has been designed in accordance with the RDCP2014 setbacks, and seeks to employ incentive provisions under Clause 6.9 of the RLEP2014, to achieve a height 45 m.
The RDCP2014 building setbacks for the subject site are as follows:
<table>
<tr><th>Setback</th><th>Requirement</th><th>Proposal</th></tr>
<tr><td>Front – Talavera Road</td><td>10 m</td><td>10 m</td></tr>
<tr><td>Rear</td><td>10 m</td><td>16.5 m</td></tr>
<tr><td>Side – east</td><td>5 m</td><td>14 m</td></tr>
<tr><td>Side – west</td><td>5 m</td><td>6.5 m</td></tr>
</table>
The design of the proposal, whilst differing in scale from the existing built form, will achieve an overall cohesive visual outcome. A sympathetic and considered palate of forms, articulation and materials will result in an overall "one building" outcome, with each building element respecting the other.</td></tr>
<tr><td>Landscaping:</td><td>The proposal seeks to retain (where possible) and enhance landscaping at the subject site, offering 13 % of the subject site as landscaped area.
Proposed landscaping for the IC3w expansion aims to offset loss of vegetation by replanting 47 endemic/native trees, approximately 170 shrubs and 5600 groundcovers. This will enhance existing areas of landscaping within the site especially those to the east and adjacent to the street. By adding additional tree planting to Talavera Road, not only will the canopy cover be increased within the public</td></tr>
</table>

TABLE 18: DEVELOPMENT CONTROLS – RDCP2014	
Control	**Comment**
	domain, but also views from the street will be further screened providing visual mitigation. Presentation to the building main entry will also be enhanced with a proposal to remove the existing monoculture and replace it with a more varied visually inviting landscape. While this does not meet the minimum 20% deep soil percentage requirement, this is still a high percentage when comparing to other recently approved developments including the Athena Data Centre to the northwest within the Stockland site. On an individual lot area basis, the Athena Data Centre also does not meet this It is considered that the proposed areas for deep soil are sufficient to support endemic canopy trees of significant size and therefore adding to the urban tree canopy objectives.

PART E CONSULTATION

5.1 SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

An application to receive SEARs was submitted to DPIE, with the SEARs (reference: SSD-24299707) subsequently issued on 12 August 2021.

A copy of the issued SEARs is included in **Appendix 1**.

During the preparation of the SEARs, the NSW DPIE also consulted with key stakeholders, and in the process obtained a list of their Key Issues for the proponent(s) to assess throughout this EIS. These Key Issues for assessment are contained in the subsequent sections.

5.1.1 City of Ryde Council – Key Issues

TABLE 19: CITY OF RYDE COUNCIL – KEY ISSUES	
Requirements	**Satisfied by**
Key Issues	
1.1. The site benefits from an existing Development Consent which addresses and overcame a number of issues with respect to impact on trees and on Council's drainage infrastructure. The Consent requires retention and protection of 67 trees (Conditions No.21 & 22 of LDA2018/322) and also to ensure that the building and structures are clear of the drainage easement, the easement was realigned for future relocation of the trunk drainage (Condition A2). It seems now that the proponent is using the SSD pathway to get rid of the constraints imposed by the L&E Court issued Development Consent. The same problems that were overcome through the previous assessment process are now being brought back. It is highly unlikely that Council will support the building over the relocated easement and the removal of trees.	A review of the key and relevant existing conditions of consent is included within **Section 2.6.6** of this EIS.
1.2. The development seeks to construct over a public drainage easement. It would be required to confirm if the Department of Planning has the authority to consent to such works, without owners consent from Council.	The proposal is consistent with the terms of the easement, and it is considered that owners consent is not required.
1.3. Despite the applicants insistence that the development will maintain clearance from the services, the concept plans depict a new column in the existing easement.	The proposal does not include any columns within the existing easement(s).

TABLE 19: CITY OF RYDE COUNCIL – KEY ISSUES	
Requirements	**Satisfied by**
1.4. The proposed construction over the agreed realignment of the easement associated with the Stage 1 development presents considerable implications in terms of construction logistics and additional costs associated with the exercise, which Council are burdened with following development. This issue led to the realignment of the easement, the proposal simply reintroduces the issue.	Considerable engagement has taken place with Council on this item, with a number of options presented. Further consultation with Council is required as both planning and commercial matters in addition to engineering matters need to be considered before final agreement can be reached – refer to **Section 5.2.1** of this EIS for further detail.
1.5. The applicants proposed flood and overland flow strategy nominates floodwaters to disperse over and through the parking area in the undercroft so as to reduce the concentration of flow through the site. This does not comply with Council's DCP Part 8.2 (Stormwater and Floodplain Management) Section 4.4.2 which stipulates open parking areas are to be no less than the 100yr ARI event. Notably vehicles are able to float in floodwaters of some 200mm and allowing flow through a carpark would present a significant concern in relation to not only private property damage but potential flood debris (floating vehicles) blocking the flowpath downstream.	It is recognised that the existing and proposed carpark is located below the 1% AEP design storm event. As this is an existing issue, a merits-based assessment is sought with an aim to improve these existing conditions where possible by widening the flow path, therefore reducing the extent of the unfavourable hazard conditions where possible. **Figure 50** presents the developed case flood hazard through the under-croft car park during the 1% AEP. The results demonstrate H1 hazard across the majority of the carpark, with a small patch of H2 adjacent to the existing loading dock & entrance. **Figure 44** suggests H1 hazard flow behaviour is safe for both pedestrians and vehicles and H2 is safe for pedestrians and large vehicles. It is also noted that the H2 hazard observed in the carpark, is surrounded by H1 flow conditions with any small vehicles that may become buoyant in this area, unlikely to continue downstream. During the PMF design storm event, a large proportion of the flood hazard conditions, in the undercroft area have been reduced from up to H4 to a maximum of H2 when compared to the existing case. As a result, hazard conditions during this event are considered an improvement when compared to the existing case with lower potential for vehicles to become unstable and float downstream. The development also proposes to reduce the number of available parking spaces from 110 to 71 therefore reducing the risk across the subject site. In addition, a steel palisade fence is located around the subject site which has the potential to prevent vehicles that may become buoyant on the subject site from floating further downstream during a major or significant event.

TABLE 19: CITY OF RYDE COUNCIL – KEY ISSUES	
Requirements	**Satisfied by**
1.6. The additional constraints through SSD expansion to the future stormwater pipe are considered unacceptable and the replacement of the future stormwater pipe within these restrictions will present real practical challenges which will then increase in cost, time and a significant safety risks.	Considerable engagement has taken place with Council on this item, with a number of options presented. Further consultation with Council is required as both planning and commercial matters in addition to engineering matters need to be considered before final agreement can be reached – refer to **Section 5.2.1** of this EIS for further detail.
1.7. The proposed expansion is considered to conflict with a number of requirements of the DCP and Council's Technical Manual.	The requirements of the DCP and Council's Technical Manual have been suitably addressed by Northrop, through their respective technical reports.
1.8. In order to remove the future constraints and improve the life of the building operations and structures, the best approach is to divert the existing 1.8m stormwater away from the existing and future buildings at no cost to Council.	The below ground network and overland flow path through the subject site have been assessed herein. The below ground network is based on the data presented in Council's adopted flood study namely the Macquarie Park Flood Risk Management Study and Plan (Bewsher, 2011) while, the overland flow path has been designed using 12D software. No changes to the existing below ground infrastructure are proposed as part of the development . The results presented herein suggests the proposed development is not expected to result in a significant adverse impact on the subject site or in adjacent properties.
1.9. There is a 2.0m wide stormwater easement traversing the rear of the site which contains an active 675mm pipeline. This pipeline comes from the rear property. No new future building footprints should be encroached into this easement or the proposed drainage easement.	The proposal remains clear of the 2.0 m wide stormwater easement at the rear of the site.
1.10. The existing pipeline reduces the diameter from 1800mm to 1200mm. It is expected that the new development will possibly divert flows to adjacent properties and increase the flood levels and runoff as well. The existing pipeline in Talavera Road may not have the capacity to convey additional flows. The subject property is located in the 1 in100 year overland flowpath therefore the detailed flood study must assess the pipe system and overland flowpath for the existing and post-developed situations. The developer must consider providing on site underground flood storage and release a little volume of water into the trunk drainage system.	Refer to **Section 6.1.11** of this EIS.
General requirements	

TABLE 19: CITY OF RYDE COUNCIL – KEY ISSUES	
Requirements	**Satisfied by**
2.1 Planning Compliance Report: The development will be subject to the RLEP2014 and the standards and requirements of the City of Ryde Development Control Plan DCP 2014 Part 4.5 Macquarie Park Corridor, Macquarie Park, and the Public Domain Technical Manual City of Ryde (PDTM) Section 6 - Macquarie Park.	RLEP2014 has been addressed in **Section 4.5.1** of this EIS.
2.2 Pavement Plan: The pavements of the footway and driveway crossings are to be designed and constructed according to the requirements of the Public Domain Technical Manual (PDTM), Section 6 - Macquarie Park.	The footway and driveway crossing to the Talavera Road frontage form part of the public domain works condition in LDA2018/322.
2.3 The Local Bicycle Network is to be maintained along the frontage of the development site as per requirement of the DCP 2014 in the form of an Off-Road shared way and in accordance with the Macquarie Park Public Domain Technical Manual.	An off-road shared way in accordance with the Macquarie Park Public Domain Technical Manual has been provided to the Talavera Road frontage, as conditioned in LDA2018/322.
2.4 Design concept plan for Road 1: A future Road 1 which will be on the southern side of the proposed development , there will be difference in the design levels between Road 1 and future internal driveway. As such, a design concept plan for Road 1 must be submitted to Council for further assessment and comments.	The property directly to the south of the site, being 63-71 Waterloo Road, Macquarie Park, has submitted a development application (LDA 2021/0184) for a mixed use development comprising of two commercial towers and extension of Road 1 along the northern boundary of the lot (adjoin the south boundary of the data centre site). As the matter has been referred to the Land and Environment Court, design documentation of the proposed road is unavailable. However, we understand that engineering drawings for Road 1 did not form part of the application. Further discussions with Council and adjacent landholders have provided an indication of the proposed Road 1 levels with the lot which are as follows. Assumed road level – western boundary = RL 54.10 Assumed road level – eastern boundary = RL 53.33

TABLE 19: CITY OF RYDE COUNCIL – KEY ISSUES	
Requirements	**Satisfied by**
	A low height retaining wall is proposed along the southern boundary of the site to allow formation of the circulation driveway. This wall ranges in height from 0.5m to 0.65m in height to match the existing boundary. The proposed design levels of 63-71 Waterloo will place the future Road 1 approximately 1.2m above the existing boundary level. Considering, the retaining required for the data centre development it would result in a retaining wall of up 1.8m high to be constructed along the boundary. It is highly likely the Road 1 construction will occur after completion of the data centre works. Thus we envisage that the smaller 0.5m to 0.65m high wall as part of the data centre site will be demolished to make way for the larger 1.8m high retaining wall supporting future Road 1 to be constructed at some point in the future. Several typical retaining wall construction type options (as block work retaining wall, or cantilevered piles with concrete infill panels) could be utilized to construct the wall.
2.5 *Retaining Wall details: Due to possible future major excavation for the new Road 1, all the retaining wall on the southern side of this property must be designed to support the neighbouring properties, all the new retaining walls must be within the private land and the depth of these retaining walls must be designed as part of the concept plan for road number 1 layout.*	The proposed design levels of 63-71 Waterloo will place the future Road 1 approximately 1.2m above the existing boundary level. Considering, the retaining required for the data centre development it would result in a retaining wall of up 1.8m high to be constructed along the boundary. It is highly likely the Road 1 construction will occur after completion of the data centre works. Thus we envisage that the smaller 0.5m to 0.65m high wall as part of the data centre site will be demolished to make way for the larger 1.8m high retaining wall supporting future Road 1 to be constructed at some point in the future. Several typical retaining wall construction type options (as block work retaining wall, or cantilevered piles with concrete infill panels) could be utilized to construct the wall. The retaining walls to the southern boundary will retain fill as the proposed Road 1 level is approximately 1.2 above the existing southern boundary level. As this retaining wall will be supporting future Council infrastructure we envisage the wall will be constructed as part of Road 1 works and located wholly within the future Road 1 corridor
2.6 *Engineering Design Plans: All new/existing Councils drainage components, stormwater pipes, kerb inlet pits, overland flow paths for the new development and discharge points shall be shown on the engineering design plans.*	The proposed development does not require the adjustment of any of Council's drainage assets. All works are to be performed within the site and utilise existing connections to Council's drainage infrastructure within the site.

TABLE 19: CITY OF RYDE COUNCIL – KEY ISSUES	
Requirements	**Satisfied by**
The applicant is to provide suitably prepared engineering plans providing details that demonstrate the smooth connection of the proposed works with the remaining street scape. This will include relevant existing and design surface levels, drainage pit configurations, kerb returns and s-kerbs that would enable street sweepers to properly manoeuvre the indented section of the road pavement.	The site has been designed so that overland flow can safely pass through the site. The work will involve modification of the surface levels on the western side of the site to accommodate over land flow. Modifications to Council's drainage system are not proposed as part of these works.
2.7 *Services and Utilities Report/Plan: Any relocation/adjustment of all public utility services affected by the proposed works shall be clearly indicated in proposed design. All of the requirements of the Public Authority shall be complied with underground Utility Services: All telecommunication and utility services are to be adjusted to match the new finished footpath/nature strip levels.* *All public utility services affected by the proposed development shall be clearly indicated in proposed design plans and all the existing/ future easements burdening the site must be show on the revised civil plans including the location of the services, depth, type and numbers.*	Adjustments of utility services were performed as part of the public domain works conditioned in LDA2018/322. This work is now complete and no further works are required in the verge due to the proposed data centre expansion. Refer to **Appendix 20** of this EIS.
2.8 *Road details: The full reconstruction of half road width for the Talavera Road frontage of the development site will be required in accordance with the City of Ryde DCP 2014 Part 8.5 - Public Civil Works, Clause 1.1.4 – Constructing Half Road and the re-alignment and adjustments to Council's infrastructure, where required, in order to ensure a smooth transition is achieved between the new and existing infrastructure.*	Refurbishment of the road pavement is not required as resurfacing works have been performed by Council in the last two years. Furthermore, the integration of the public domain works (being replacement of the kerb and gutter) under LDA 2018/322 and completed by Macquarie Data consider the long-term performance of the road pavement, based on a strategy agreed with Council. The to protect the integrity of Council's asset we suggest that a dilapidation report be prepared for the existing road pavement and verge to the frontage prior to the commencement of construction. Any damaged that occurs to the road as a result of construction activities shall be repaired by the applicant.
Flooding	
3.1 *New detailed flood study with data files: The subject site is subject to flooding, therefore the applicant must submit a new detailed flood study as part of this planning proposal. The revised flood study shall be prepared in accordance with Council's stormwater and Floodplain Technical Manual, and shall demonstrate that the proposed works will not worsen the flooding situation in the area.*	Refer to **Appendix 26** of this EIS. A detailed flood study has been prepared and is presented herein. The study has been prepared based on a previous approved development assessment using Council's adopted flood study – namely the Macquarie Catchment Flood Risk Management Study and Plan (Bewsher, 2011). The results presented herein suggests the proposed development is not expected to have a significant adverse impact on the subject site or in adjacent properties.

TABLE 19: CITY OF RYDE COUNCIL – KEY ISSUES	
Requirements	**Satisfied by**
3.2 Pipe Replacement Strategy: For the SSD to be supported, that deviates from the approved DA, the existing 1800mm Council's Stormwater Pipe traversing the site diagonally will have to be replaced by a new pipe clear of the building /closer to the side boundaries within the property, in order to avoid any current and future obstructions. These works will have to occur prior to the construction of SSD and at no cost to Council. The preferred location of the new pipe will have to be determined in agreement with Council upon the final civil design.	Refer to **Section 6.1.9** of this EIS.
Stormwater	
4.1 A Stormwater Management Plan for the proposed works must be submitted. Plans design documentation must show the proposed finished surface levels, surface drainage system and drainage components – all of which are to demonstrate compliance with the DCP. In regards to the provision for OSD, the scale of development will warrant the system designed utilising DRAINS modelling software. These data input files should be provided for review.	Refer to **Appendix 25** of this EIS.
4.2 Flood Impact: The site is noted to be impacted by flooding and over land flow and therefore will warrant a flood impact assessment to be provided. The flood impact statement must address the requirements in Section 4 of councils DCP part 8.2 (stormwater and floodplain management) and any modelling required by this study must be submitted for review.	Refer to **Appendix 26** of this EIS. A review of the proposed development with respect to Council's DCP Part 8.2 – Stormwater and Floodplain Management - Section 4 has been performed as presented within **Section 6.1.11** of this EIS. The modelling methodology and results are presented within **Appendix 26** and **Section 6.1.11** of this EIS.
4.3 Service Investigation Report: The proposed work seek to construct over councils drainage easement and public services. To guage the impact on this infrastructure, all plans must portray the exact location of councils of the public drainage service through the site and any details necessary to demonstrate that the propose works will not impose on this infrastructure or service.	Refer to **Appendix 7** and **Appendix 20** of this EIS.
Traffic and parking	
5.1 Traffic Report & Swept Path Analysis: The development proposes modification to parking and service areas on the lot. Accordingly a Traffic report will be required with the application to ensure the design of these areas are in accordance with the requirements of AS2890 and Council's DCP. Notably the report will need to perform a swept path analysis of the service area utilising the largest anticipated service vehicles so as to ensure they can safely access and exit the site.	Refer to **Appendix 16** of this EIS.

TABLE 19: CITY OF RYDE COUNCIL – KEY ISSUES	
Requirements	**Satisfied by**
5.2 The traffic and parking impact assessment report is to, at minimum, address the following: *a) The additional traffic that is likely to be generated by the proposed development during peak hour periods. As the Guide to Traffic Generating Developments does not provide traffic generation rates specific to data centres, it is advised that the traffic generation rates adopted for the proposed development be estimated based on traffic surveys of the existing data centre on site. In this regard, the following factors are to be considered in determining an appropriate traffic generation rate:* ▪ *Mode of transport adopted by staff and visitors; and* ▪ *Maximum number of people that is expected to be on-site at any point in time* *b) The future 10-year (2031) traffic conditions along Talavera Road during peak hour periods and the impact of the development traffic on Talavera Road with respect to the mid-block capacity and the operational performance of nearby intersections.* *c) Provide appropriate recommendations on potential mitigation strategies/road/intersection/active transport (pedestrian and cyclist) infrastructure improvements to alleviate any adverse traffic impacts contributed by the proposed development on the adjoining public road network.* *d) The vehicular access, off-street parking and heavy vehicle servicing arrangements shall be designed to comply with the following:* ▪ *The Australian Standard for Parking Facilities Part 1: Off-Street Parking (AS 2890.1);* ▪ *The Australian Standard for Parking Facilities Part 2: Off-Street Commercial Vehicle Facilities (AS2890.2);* ▪ *The Australian Standard for Parking Facilities Part 3: Bicycle Parking Facilities (AS2890.3);* ▪ *The Australian Standard for Parking Facilities Part 6: Off-Street Parking for People with Disabilities (AS2890.6); and* ▪ *Ryde City Council's Development Control Plan*	Refer to **Appendix 16** of this EIS.

TABLE 19: CITY OF RYDE COUNCIL – KEY ISSUES	
Requirements	**Satisfied by**
e) There should be effective separation between the loading dock areas and the off-street car parking areas to minimise conflict between passenger and heavy vehicle traffic within the site. Further, the applicant is to advise on the largest vehicle that is required to be serviced on site. A swept path assessment shall be undertaken to demonstrate that the largest/longest vehicle to be serviced on site is capable of entering, turning around and exiting the loading dock area in a safe and efficient manner.	
Trees and landscaping	
6.1 Arboricultural Impact Assessment. Given the proposed impact to existing protected trees, an Arboricultural Impact Assessment should be prepared by a suitably qualified AQF Level 5 Arborist. An Arboricultural Impact Assessment (AIA) is required of all trees on site, trees on adjoining sites where any part of the development will encroach into the Tree Protection Zone of those trees and any street trees. This Assessment is to be carried out as per the requirements of Australian Standard AS4970-2009 Protection of trees on development sites and in accordance with the City of Ryde Tree Management Technical Manual and is to provide an assessment of all trees within and adjoining the subject site which are likely to be impacted by the proposal. In the AIA must consider the impacts of the development including: ▪ *Stormwater or drainage works.* ▪ *Cut and fill.* ▪ *Fence and or Retaining Walls that will be required.* ▪ *Car parking and driveway.* ▪ *Any encroachment on the Tree Protection Zone and Structural Root Zone of trees on site or on adjoining sites.*	Refer to **Appendix 10** of this EIS.
6.2 The Report must also include a tree protection plan (drawing) showing the TPZs for the trees as required by Australian Standard AS4970-2009. Protection of trees on development sites. It is best if this plan also shows the Structural Root Zones and is superimposed on the Site Plan showing the development and the assessed trees.	Refer to **Appendix 10** of this EIS.

TABLE 19: CITY OF RYDE COUNCIL – KEY ISSUES	
Requirements	**Satisfied by**
6.3 Impact to Existing Trees. Design changes should be undertaken to reduce the level of impact to existing protected trees to a sustainable level. This includes, but is not limited to; Trees 1, 1a, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 56, 81, 84, 89 & 94 within the subject site and Trees 14, 83 & 95 within the neighbouring allotments – each of which were prescribed for retention under Condition 21 of the approval handed down by the Land and Environment Court of NSW ([2019] NSWLEC 1470).	The impact to existing trees cannot be reduced, however the proposed landscaping for the IC3W expansion aims to offset loss of vegetation by replanting 47 endemic/native trees, approximately 170 shrubs and 5600 groundcovers. This will enhance existing areas of landscaping within the site especially those to the east and adjacent to the street. By adding additional tree planting to Talavera Road, not only will the canopy cover be increased within the public domain, but also views from the street will be further screened providing visual mitigation. Presentation to the building main entry will also be enhanced with a proposal to remove the existing monoculture and replace it with a more varied visually inviting landscape.
6.4 A Landscape Plan is required prepared by a Landscape Architect.	Refer to **Appendix 9** of this EIS.
6.5 A Biodiversity Development Assessment Report (BDAR) as required for the site under the proposed SSD.	N/A – A BDAR Wavier has been granted, refer to **Appendix 29** of this EIS.
Voluntary Planning Agreement (VPA)	
Council advises that the proposed SSD cannot rely on the previous VPA applicable under the DA. The requirements of the existing VPA negotiated with the LDA approval has been completed. The VPA did not require any land or road dedication, works in kind or offsets. The contribution required under the VPA was paid on execution, hence the VPA was not registered on title. As the VPA's obligation has been met, it is considered concluded. *As such a new VPA will be required reflective of the proposed expansion and increase floor space as part of the proposed SSD. The applicant is advised to refer to Clause 6.9 of the RLEP2014.*	Discussion have been ongoing with the City of Ryde Council regarding the provision of a VPA under the subject SSD Application. To invoke the provisions under Clause 6.9 of RLEP 2014 and achieve a 45m height limit, MDC propose to enter into a VPA with the City of Ryde Council. It is noted that a VPA was executed under LDA2018/0322 between the abovementioned parties, and any new VPA for the subject SSD would seek to obtain a credit where there have already been monies paid relevant to the proposal. The monetary rate would be in the order of $275 per square metre and MDC may also seek to pay Section 7.11 contributions as part of any new VPA. The terms of the VPA and the draft offer are yet to be finalised. Any future arrangement regarding this matter will be documented and reported to NSW DPIE as part of the SSD assessment process.
Planning report	
Planning report should indicate clear details of FSR and height and compliance with the relevant planning control.	Refer to **Section 4.5.1** of this EIS.

5.1.2 EPA – Key Issues

TABLE 20: EPA – KEY ISSUES	
Requirements	**Satisfied by**
Key Issues	
Scheduled activity	

TABLE 20: EPA – KEY ISSUES	
Requirements	**Satisfied by**
Based on review of the information provided, it is unclear whether the proposal will require an environment protection licence (EPL) under the Protection of the Environment Operations Act 1997 ('the POEO Act'). The EPA recommends the proponent consider whether an EPL will be required under the following: *I. Clause 9 of Schedule 1 of the POEO Act for chemical storage, petroleum products storage. If the proposal has a capacity for more than 2000 tonnes of diesel storage, an EPL would be required.* *II. Clause 17 of Schedule 1 of the POEO Act for electricity generation for metropolitan electricity works (internal combustion engines). This does not apply for stand-by plant that is operated for less than 200[1] hours per year.* *[1] noting that multiple generators being operated concurrently for an hour would count as one hour, rather than cumulatively adding the testing time of each generator*	The proposal does not trigger an EPL under the POEO Act, refer to **Section 4.3.3** of this EIS.
Chemical storage	
Accurate capacities of diesel storage capacity must be provided in the Environmental Impact Statement (EIS). *Information on the location and design of chemical bunding and containments should also be included in the EIS. Bunding requirements for above ground storage tanks are set out in AS 1940:2017 The storage and handling of flammable and combustible liquids.*	Refer to **Section 3.2.3** and **Section 6.1.8** of this EIS.
Electricity generation	
The EIS should definitively state whether scheduled testing will exceed the 200-hour annual limit. If the testing time could exceed 200 hours per year, then the proposed activity may meet the trigger for Clause 17, Schedule 1 of the POEO Act. Please note that the EPA would consider 'operating' to include testing, if testing involves starting the generator. In addition, the definition of 'plant' in this scheduled activity includes all generators on the premises, not each individual generator. *The EPA requests further information be provided in the EIS about the back-up generators, including:* *a) number of back-up generators proposed;* *b) individual capacity (in terms of megawatts and megajoules per second);* *c) maximum operating time in an emergency situation;*	Refer to **Section 4.3.3** and **Section 6.1.4** of this EIS.

TABLE 20: EPA – KEY ISSUES	
Requirements	**Satisfied by**
d) testing procedure, frequency and duration; *e) confirmation that testing will be carried out individually or in clusters; and* *f) justification of the need to test during the evening or at night (if applicable).*	
Noise and vibration	
The EPA notes that that the site is close to a number of sensitive receivers including: ▪ *100m to the north of Excelsia College;* ▪ *200m to the south-east of WiSE Specialist Emergency Clinic;* ▪ *300m to the south of high density residential zoned and;* ▪ *300m to the south-east of Meriton Suites North Ryde; and* ▪ *Between 150m - 300m to the south-east, west, and north-west of several childcare centres.* *The EPA recommends that a noise and vibration assessment be prepared in accordance with the Noise Policy for Industry (2017) and include an assessment of all potential noise and vibration generating activities occurring at the premises, including the operation and testing of specific generators that will be used for backup electricity generation. The noise and vibration assessment must consider all sensitive receptors that will potentially be impacted during construction and operational stages of the proposal.*	A Noise and Vibration Assessment has been prepared by Renzo Tonin, which forms **Appendix 14** of this EIS.
Air quality	
The EPA notes that an air quality assessment will be undertaken within the EIS for the proposal to assess air quality impacts from back-up generator emissions. *The EPA recommends that the assessment should include, but not be limited to:* ▪ *Generator specifications, electrical generation capacity and generator fuel rate to assess against the criteria for a scheduled activity;* ▪ *Assessment of emissions from the generators against the POEO (Clean Air) Regulation standards of concentration;* ▪ *Assessment of offsite impacts from the operation of the proposed generators in strict accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (2016); and*	An AQIA has been prepared by SLR Consulting, and forms **Appendix 15** of this EIS.

TABLE 20: EPA – KEY ISSUES	
Requirements	**Satisfied by**
▪ *A description of any proposed mitigation, monitoring and management measures the proponent intends to implement to reduce air quality impacts associated with the proposal.*	
Plans and Documents	
N/A	**N/A**
Consultation	
The EPA requests further consultation on the proposal following submission of the EIS.	Refer to **Section 5.2.1** of this EIS.

5.1.3 TfNSW – Key Issues

TABLE 21: TFNSW – KEY ISSUES	
Requirements	**Satisfied by**
Key Issues	
Transport and accessibility	
1. Details of all traffic types and volumes likely to be generated by the proposed development during construction and operation, including a description of haul route origins and destinations, including:	A Transport Impact Assessment has been prepared by The Transport Planning Partnership and forms part of **Appendix 16** of this EIS.
a. Daily inbound and outbound vehicle traffic profile by time of day and day of week (if travel patterns differ across the week);	The proposed development is expected to generate at most, 23 vehicle trips per hour in the AM and PM peak period. This equates to one vehicle movement every two to three minutes, which is considered negligible.
b. Site and traffic management plan on how to manage number of vehicles likely to be generated during construction and operation and awaiting loading, unloading or servicing can be accommodated on the site to avoid queuing in the surrounding road network	Site operational vehicle movements are considered negligible, therefore an operational traffic management plan is not warranted. Notwithstanding, a preliminary Construction Traffic Management Plan has been prepared by The Transport Planning Partnership and forms part of **Appendix 17** of this EIS.
c. Detailed plan of proposed layout of internal road network to demonstrate that the site will be able to accommodate the most productive vehicle types and parking on site in accordance with the relevant Australian Standard and Council's Development Control Plan;	Swept path diagrams form part of the Transport Impact Assessment, contained within **Appendix 16** of this EIS.
d. Plans detailing how the proposed development connects to adjoining sites to facilitate their future development for their intended purposes;	Reference should be made to the Architectural Plans within **Appendix 7** of this EIS.
e. Swept path diagrams to demonstrate vehicles entering, exiting and manoeuvring throughout the site;	Refer to **Section 6.1.7** of this EIS.

TABLE 21: TFNSW – KEY ISSUES	
Requirements	**Satisfied by**
f. An assessment of the forecast impacts on traffic volume generated on road safety and capacity of road network including consideration of cumulative traffic impacts at key intersections using SIDRA or similar traffic model as prescribed by TfNSW (former Roads and Maritime). The traffic modelling should consider the scenarios of year 2026, 2031, 2036. These should include, but not be limited to: *i. Lane Cove Road / Talavera Road* *ii. Talavera Road / Khartoum Road*	Refer to **Section 6.1.7** of this EIS.
g. To ensure that the above requirements are fully addressed, an assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including consideration of cumulative traffic impacts at key intersections using SIDRA or similar traffic model. This is to include the identification and consideration of approved and proposed developments/planning proposals/road upgrades in the vicinity.	Refer to **Section 6.1.7** of this EIS.
h. details of road upgrades, infrastructure works, or new roads or access points required for the development;	A plan detailing the extent of road reconstruction work prepared by Northrop is provided in **Appendix 24** of this EIS. The plan shows the extent of pavement reconstruction, and final levels and grading of the new pavement. The new pavement will extend from the existing road centre line for the full extent of the Talavera Road frontage.
i. details of travel demand management measures to minimise the impact on general traffic and bus operations, including details of a location-specific sustainable travel plan (Green Travel Plan and specific Workplace Travel Plan) and the provision of facilities to increase the non-car mode share for travel to and from the site;	A detailed Workplace Travel Plan (WTP) can be prepared in response to a suitable condition of consent for this SSD.
j. details of the adequacy of existing public transport or any future public transport infrastructure within the vicinity of the site, pedestrian and bicycle networks and associated infrastructure to meet the likely future demand for the proposed development; and	Refer to **Section 6.1.7** of this EIS.
k. measures to integrate the development with the existing/future public transport network.	Refer to **Section 6.1.7** of this EIS.

TABLE 21: TFNSW – KEY ISSUES	
Requirements	**Satisfied by**
l. The preparation of a preliminary Construction Pedestrian and Traffic Management Plan (CPTMP) to demonstrate the proposed management of the impact in relation to construction traffic addressing the following: *i. assessment of cumulative impacts associated with other construction activities (if any);* *ii. an assessment of road safety at key intersection and locations subject to heavy vehicle construction traffic movements and high pedestrian activity;* *iii. details of construction program detailing the anticipated construction duration and highlighting significant and milestone stages and events during the construction process;* *iv. details of anticipated peak hour and daily construction vehicle movements to and from the site;* *v. details of on-site car parking and access arrangements of construction vehicles, construction workers to and from the site, emergency vehicles and service vehicle;* *vi. details of temporary cycling and pedestrian access during construction.*	Refer to **Appendix 17** of this EIS.
2. Traffic Counts: *TfNSW requests that any counts undertaken are not within close proximity to the school holidays/long weekend. Counts undertaken within close proximity to these events may not indicate normal traffic conditions. Ideally vehicle counts should be undertaken during a typical day, to include Thursday (or Wednesday) and Friday for the study (not near school/public holidays). This will provide the departments with an accurate understanding of the existing traffic conditions and the actual impact of this development application to the surrounding network.* *Should the date of the counts be within a week either side of the above events, it will be recommended that new counts are undertaken at more appropriate dates and are to include a breakdown of light and heavy vehicles.*	Noted.
Plans and Documents	
N/A	**N/A**
Consultation	

TABLE 21: TFNSW – KEY ISSUES	
Requirements	**Satisfied by**
During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners.	Refer to **Section 5.2.1** of this EIS.

5.1.4 EES – Key Issues

TABLE 22: EES – KEY ISSUES	
Requirements	**Satisfied by**
Key Issues	
Biodiversity	
1. *Biodiversity impacts related to the proposed development are to be assessed in accordance with Section 7.9 of the Biodiversity Conservation Act 2017 the Biodiversity Assessment Method and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must include information in the form detailed in the Biodiversity Conservation Act 2016 (s6.12), Biodiversity Conservation Regulation 2017 (s6.8) and Biodiversity Assessment Method, including an assessment of the impacts of the proposal (including an assessment of impacts prescribed by the regulations).*	N/A – A BDAR wavier under section 7.9 of the BC Act has been granted, refer to **Appendix 29** of this EIS.
2. *The BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the Biodiversity Assessment Method.*	N/A – A BDAR wavier under section 7.9 of the BC Act has been granted, refer to **Appendix 29** of this EIS.
3. *The BDAR must include details of the measures proposed to address the offset obligation as follows:* ▪ *The total number and classes of biodiversity credits required to be retired for the development/project;* ▪ *The number and classes of like-for-like biodiversity credits proposed to be retired;* ▪ *The number and classes of biodiversity credits proposed to be retired in accordance with the variation rules;* ▪ *Any proposal to fund a biodiversity conservation action;* ▪ *Any proposal to conduct ecological rehabilitation (if a mining project);* ▪ *Any proposal to make a payment to the Biodiversity Conservation Fund.* *If seeking approval to use the variation rules, the BDAR must contain details of the reasonable steps that have been taken to obtain requisite like-for-like biodiversity credits.*	N/A – A BDAR wavier under section 7.9 of the BC Act has been granted, refer to **Appendix 29** of this EIS.
4. *The BDAR must be submitted with all spatial data associated with the survey and assessment as per the BAM.*	N/A – A BDAR wavier under section 7.9 of the BC Act has been granted, refer to **Appendix 29** of this EIS.

TABLE 22: EES – KEY ISSUES	
Requirements	**Satisfied by**
5. *The BDAR must be prepared by a person accredited in accordance with the Accreditation Scheme for the Application of the Biodiversity Assessment Method Order 2017 under s6.10 of the Biodiversity Conservation Act 2016.*	N/A – A BDAR wavier under section 7.9 of the BC Act has been granted, refer to **Appendix 29** of this EIS.
Water and soils	
6. *The EIS must map the following features relevant to water and soils including:* *a. Acid sulfate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Planning Map).* *b. Rivers, streams, wetlands, estuaries (as described in s4.2 of the Biodiversity Assessment Method)* *c. Wetlands as described in s4.2 of the Biodiversity Assessment Method* *d. Groundwater* *e. Groundwater dependent ecosystems* *f. Proposed intake and discharge locations.*	Refer to **Section 6.1.10** of this EIS.
7. *The EIS must describe background conditions for any water resource likely to be affected by the development, including:* ▪ *Existing surface and groundwater* ▪ *Hydrology, including volume, frequency and quality of discharges at proposed intake and discharge locations* ▪ *Water Quality Objectives (as endorsed by the NSW Government http://www.environment.nsw.gov.au/ieo/index.htm) including groundwater as appropriate that represent the community's uses and values for the receiving waters* ▪ *Indicators and trigger values/criteria for the environmental values identified at (c) in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or local objectives, criteria or targets endorsed by the NSW Government* ▪ *Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions http://www.environment.nsw.gov.au/research-andpublications/publications-search/risk-based-framework-for-considering-waterwayhealth-outcomes-in-strategic-land-use-planning.*	Refer to **Section 6.1.10** of this EIS.
8. *The EIS must assess the impact of the development on hydrology, including:* *a. Water balance including quantity, quality and source.* *b. Effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas.* *c. Effects to downstream water-dependent fauna and flora including groundwater dependent ecosystems.*	Refer to **Section 6.1.10** of this EIS.

TABLE 22: EES – KEY ISSUES	
Requirements	**Satisfied by**
d. Impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains that affect river system and landscape health such as nutrient flow, aquatic connectivity and access to habitat for spawning and refuge (e.g. river benches). *e. Changes to environmental water availability, both regulated/licensed and unregulated/rules-based sources of such water.* *f. Mitigating effects of proposed stormwater and wastewater management during and after construction on hydrological attributes such as volumes, flow rates, management methods and re-use options.* *g. Identification of proposed monitoring of hydrological attributes.*	
Flooding and coastal hazards	
9. The EIS must map the following features relevant to flooding as described in the Floodplain Development Manual 2005 (NSW Government 2005) including: *a. Flood prone land.* *b. Flood planning area, the area below the flood planning level.* *c. Hydraulic categorisation (floodways and flood storage areas)* *d. Flood Hazard.*	Refer to **Section 6.1.11** of this EIS.
10. The EIS must describe flood assessment and modelling undertaken in determining the design flood levels for events, including a minimum of the 5% Annual Exceedance Probability (AEP), 1% AEP, flood levels and the probable maximum flood, or an equivalent extreme event.	Refer to **Section 6.1.11** of this EIS.
11. The EIS must model the effect of the proposed development (including fill) on the flood behaviour under the following scenarios: *a. Current flood behaviour for a range of design events as identified above. This includes the 0.5% and 0.2% AEP year flood events as proxies for assessing sensitivity to an increase in rainfall intensity of flood producing rainfall events due to climate change.*	Refer to **Section 6.1.11** of this EIS.
12. Modelling in the EIS must consider and document: *a. Existing council flood studies in the area and examine consistency to the flood behaviour documented in these studies.* *b. The impact on existing flood behaviour for a full range of flood events including up to the probable maximum flood, or an equivalent extreme flood.* *c. Impacts of the development on flood behaviour resulting in detrimental changes in potential flood affection of other developments or land. This may include redirection of flow, flow velocities, flood levels, hazard categories and hydraulic categories* *d. Relevant provisions of the NSW Floodplain Development Manual 2005.*	Refer to **Section 6.1.11** of this EIS.

TABLE 22: EES – KEY ISSUES	
Requirements	**Satisfied by**
13. The EIS must assess the impacts on the proposed development on flood behaviour, including: *a. Whether there will be detrimental increases in the potential flood affectation of other properties, assets and infrastructure.* *b. Consistency with Council floodplain risk management plans.* *c. Consistency with any Rural Floodplain Management Plans.* *d. Compatibility with the flood hazard of the land.* *e. Compatibility with the hydraulic functions of flow conveyance in floodways and storage in flood storage areas of the land.* *f. Whether there will be adverse effect to beneficial inundation of the floodplain environment, on, adjacent to or downstream of the site.* *g. Whether there will be direct or indirect increase in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of riverbanks or watercourses.* *h. Any impacts the development may have upon existing community emergency management arrangements for flooding. These matters are to be discussed with the NSW SES and Council.* *i. Whether the proposal incorporates specific measures to manage risk to life from flood. These matters are to be discussed with the NSW SES and Council.* *j. Emergency management, evacuation and access, and contingency measures for the development considering the full range or flood risk (based upon the probable maximum flood or an equivalent extreme flood event). These matters are to be discussed with and have the support of Council and the NSW SES.* *k. Any impacts the development may have on the social and economic costs to the community as consequence of flooding.*	Refer to **Section 6.1.11** of this EIS.
Plans and Documents	
N/A	**N/A**
Consultation	
N/A	**N/A**

5.1.5 Heritage NSW – Key Issues

TABLE 23: HERITAGE NSW – KEY ISSUES	
Requirements	**Satisfied by**
Key Issues	

TABLE 23: HERITAGE NSW – KEY ISSUES	
Requirements	**Satisfied by**
1. *The EIS must identify and describe the Aboriginal cultural heritage values that exist across the whole area that will be affected by the development and document these in an Aboriginal Cultural Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation. The identification of cultural heritage values must be conducted in accordance with the Code of Practice for Archaeological Investigation in NSW (DECCW 2010), and be guided by the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales (OEH 2011).*	Refer to **Section 6.1.16** of this EIS.
2. *Consultation with Aboriginal people must be undertaken and documented in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the ACHAR.*	Refer to **Section 6.1.16** of this EIS.
3. *Impacts on Aboriginal cultural heritage values are to be assessed and documented in the ACHAR. The ACHAR must demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the EIS must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to Heritage NSW.*	Refer to **Section 6.1.16** of this EIS.
4. *The assessment of Aboriginal cultural heritage values must include a surface survey undertaken by a qualified archaeologist. The result of the surface survey is to inform the need for targeted test excavation to better assess the integrity, extent, distribution, nature and overall significance of the archaeological record. The results of surface surveys and test excavations are to be documented in the ACHAR.*	Refer to **Section 6.1.16** of this EIS.
5. *The assessment of Aboriginal cultural heritage values must include a surface survey undertaken by a qualified archaeologist. The result of the surface survey is to inform the need for targeted test excavation to better assess the integrity, extent, distribution, nature and overall significance of the archaeological record. The results of surface surveys and test excavations are to be documented in the ACHAR.*	Refer to **Section 6.1.16** of this EIS.
6. *The ACHAR must outline procedures to be followed in the event Aboriginal burials or skeletal material is uncovered during construction to formulate appropriate measures to manage the impacts to this material.*	Refer to **Section 6.1.16** of this EIS.
NOTE: The process described in the Due Diligence Code of Practice for the protection of Aboriginal objects in NSW (DECCW 2010) is not sufficient to assess the impacts on Aboriginal cultural heritage of Major Projects.	Noted.
Plans and Documents	
N/A	**N/A**
Consultation	
Consultation with Aboriginal people must be undertaken and documented in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW 2010).	Refer to **Section 6.1.16** of this EIS.

5.1.6 Fire and Rescue NSW

TABLE 24: FIRE AND RESCUE NSW – KEY ISSUES	
Requirements	**Satisfied by**
Key Issues	
1. *To ensure that the fire prevention, detection, protection and firefighting measures are appropriate to the specific fire hazards and adequate to meet the extent of potential fires, a comprehensive Fire Safety Study (FSS) is recommended to be undertaken.*	It is understood that a Fire Safety Study will be required as a condition of consent. Notwithstanding, Innova Fire Safety Specialists have prepared a Fire Safety Strategy to inform the proposed development; refer to **Appendix 19** of this EIS.
2. *That the FSS is developed in accordance with the requirements of Hazardous Industry Planning Advisory Paper No.2 (HIPAP No.2).*	Noted – a FSS can be provided as a condition of consent.
3. *That the FSS is required to be developed in consultation with FRNSW and to the satisfaction of the operational requirements of FRNSW. The development of a FSS should be a condition of consent.*	Noted – a FSS can be provided as a condition of consent.
4. *That the development of the FSS considers the operational capability of local fire agencies and the need for the facility to achieve an adequate level of on-site fire and life safety independence.*	Noted – a FSS can be provided as a condition of consent.
5. *FRNSW preference is to review the Preliminary Hazards Analysis (PHA) report as this will determine the approach and design of the recommended fire safety study.*	It is understood that a Fire Safety Study will be required as a condition of consent. Notwithstanding, Innova Fire Safety Specialists have prepared a Fire Safety Strategy to inform the proposed development; refer to **Appendix 19** of this EIS.
Plans and Documents	
N/A	**N/A**
Consultation	
N/A	A consultation request was sent via email on 16 September 2021 and a response is yet to be received.

5.1.7 Sydney Water

TABLE 25: SYDNEY WATER – KEY ISSUES	
Requirements	**Satisfied by**
Key Issues	
Water-related infrastructure requirements	
1. *The proponent of development should determine service demands following servicing investigations and demonstrate that satisfactory arrangements for drinking water, wastewater, and recycled water (if required) services have been made.*	Refer to **Section 6.1.9** of this EIS.

TABLE 25: SYDNEY WATER – KEY ISSUES	
Requirements	**Satisfied by**
2. *The proponent must obtain endorsement and/or approval from Sydney Water to ensure that the proposed development does not adversely impact on any existing water, wastewater or stormwater main, or other Sydney Water asset, including any easement or property. When determining landscaping options, the proponent should take into account that certain tree species can cause cracking or blockage of Sydney Water pipes and therefore should be avoided.*	Refer to **Section 6.1.9** of this EIS.
3. *Strict requirements for Sydney Water's stormwater assets (for certain types of development) may apply to this site. The proponent should ensure that satisfactory steps/measures been taken to protect existing stormwater assets, such as avoiding building over and/or adjacent to stormwater assets and building bridges over stormwater assets. The proponent should consider taking measures to minimise or eliminate potential flooding, degradation of water quality, and avoid adverse impacts on any heritage items, and create pipeline easements where required.*	Refer to **Section 6.1.9** of this EIS.
4. *As this development may create trade wastewater, Sydney Water may have trade wastewater requirements which need to be met. By law, the property owner must submit an application requesting permission to discharge trade wastewater to Sydney Water's sewerage system. The proponent must obtain Sydney Water approval for this permit before any business activities can commence. Given this development may comprise waste operations, wastewater may discharge into a sewerage area that is subject to wastewater reuse. Please contact Sydney Water's Business Customer Services to assess what is required, send your permit application or to find out more information. They can be contacted at the following email address: businesscustomers@sydneywater.com.au.*	Refer to **Section 6.1.9** of this EIS.
Integrated water cycle management	
5. *The proponent should outline any sustainability initiatives that will minimise/reduce the demand for drinking water, including any alternative water supply and end uses of drinking and non-drinking water that may be proposed, and demonstrate water sensitive urban design (principles are used), and any water conservation measures that are likely to be proposed. This will allow Sydney Water to determine the impact of the proposed development on our existing services and required system capacity to service the development.*	Refer to **Section 6.1.13** of this EIS.
Plans and Documents	
N/A	**N/A**
Consultation	
It is recommended that the proponent engage a Water Servicing Coordinator as soon as possible, and a feasibility application is lodged with Sydney Water prior to a Section 73 application being made.	Refer to **Section 6.1.16** of this EIS.
It is recommended that an inception meeting is held with the relevant Sydney Water account manager after the proponent has prepared a detailed concept servicing proposal for potable water wastewater services and potentially recycled water services.	Refer to **Section 6.1.16** of this EIS.

5.2 STAKEHOLDER CONSULTATION

As recommended by the SEARs, the following stakeholder consultation has been undertaken. Stakeholders that have been consulted include:

- City of Ryde Council
- Environment Protection Authority
- the Department's Environment, Energy and Science Group
- the Department's Water Group
- Transport for NSW
- Ausgrid
- Sydney Water
- Heritage NSW
- Metropolitan Local Aboriginal Land Council
- surrounding local landowners,
- businesses and stakeholders
- any other public transport, utilities or community service providers

A comprehensive level of community and stakeholder engagement has been undertaken for the proposed development. This has included numerous meetings and notification letters to both agencies and all potentially-impacted stakeholders.

A comprehensive Community and Stakeholder Participation Strategy (located in **Appendix 5** of this EIS) has been prepared by Astrolabe Group, in support of this SSD Application, offering a summary and analysis of all community and stakeholder consultations, distilling into themes, and those items identified in the consultation process, as significant.

The information provided herein, demonstrates that genuine consultation has already taken place with stakeholders, seeking feedback on the proposed development.

5.2.1 Agency Consultation

In preparation of this EIS relevant agencies were consulted with to inform the proposed development. Agency consultation undertaken to date includes, but is not limited to, those detailed in **TABLE 26**.

TABLE 26: AGENCY CONSULTATION RECORDS

Stakeholder	Consultation Notes
City of Ryde Council	Session One An engagement session was held with City of Ryde Council on 7 October 2021. The key items for discussion during this session were as follows: ▪ Construction over existing stormwater line and future easement ▪ Overland flow and flooding ▪ 'Road Number 1' ▪ Public domain works ▪ Other minor civil items Following the session, MDC agreed to update the existing stormwater line and future easement to align with the boundary of the proposed building. Meeting minutes form part of the Community and Stakeholder Engagement Report contained within **Appendix 5** of this EIS.
	Session Two A follow up engagement session was held with City of Ryde Council on 21 October2021. The key items for discussion during this session were: ▪ Recap of previous engagement session ▪ Stormwater pipeline and easement alignment options Following the session, MDC noted that the stormwater easement alignment would be updated in response to Council's comments.

TABLE 26: AGENCY CONSULTATION RECORDS	
Stakeholder	**Consultation Notes**
	Meeting minutes form part of the Community and Stakeholder Engagement Report contained within **Appendix 5** of this EIS.
Sydney Water	A Feasibility Application was submitted to Sydney water on 24 September 2021 to confirm that Sydney Water's infrastructure will be able to cater to the proposal's potable water and waste water demands.
John Holland Group	MDC met with representatives from John Holland Group (JHG) on 14 October 2021. Prior to the meeting, MDC shared the SEARs application and architectural plans with JHG for additional information. During the engagement session, MDC provided a brief summary of the proposal, followed by discussion of: ▪ Connectivity - namely the potential for enhanced connectivity between the proposal and the future park on the adjacent site being built by JHG, providing greater amenity to workers ▪ Data Centre Operation - including expected number of employees, commercial space and parking ▪ Application process and expected timing Following the meeting, MDC received a note from JHG stating that they have no issues with the works proposed and are supportive of the development.
Other stakeholders responses	Responses were received from the following key stakeholders noting that they had sufficient information, or had been consulted previously, and did not require further engagement: ▪ Goodman (adjacent landowner) ▪ Stockland (adjacent landowner) ▪ NSW Environment Protection Authority

5.2.2 Community Stakeholder Consultation

As part of the engagement and communication process, the following consultation was undertaken by Astrolabe Group:

- Website
- Community and stakeholder letterbox drop and email notification
- Online community information session
- Key stakeholder letters

The description and reach of each of the above are summarised as follows.

TABLE 27: CONSULTATION OVERVIEW		
Tool	**Description**	**Reach**
Website	Website set up to provide details regarding the project to the public, also linking to the NSW DPIE's Major Projects site for the SSDA. The website also provides a feedback form to allow those interested to submit feedback to ask questions. https://macquariedatacentres.com/ic3superwest_community/	0 feedback forms received
Community and stakeholder letterbox drop and email notification	A postcard providing information about the proposal and an Online Community Information Session was distributed locally. The extent of the distribution is shown in **Figure 28** below. In addition, Macquarie University, Macquarie Centre and Macquarie Park Ryde Business Chamber were notified via	1,500 dwellings and businesses via letterbox drop

TABLE 27: CONSULTATION OVERVIEW		
Tool	**Description**	**Reach**
	email, and asked to distribute to their departments, tenants and member network respectively.	
Online Community Information session	An online Community Information Session was held on 8 September 2021 to ensure community and stakeholders had an opportunity to hear about relevant proposal details, meet the project team, as well as table any questions or provide feedback. Community and stakeholders were informed about the session via the postcard letterbox drop.	One attendee
Key stakeholder letters	Letters were sent via email to key stakeholders listed in the SEARs. The letters provided details of the proposal, timeline and offered the opportunity for engagement to discuss any concerns or relevant matters. A follow up letter was sent to the community information session attendee, offering another opportunity to meet with the project team.	12 letters – refer to **Appendix 5** of this EIS

Figure 28 Consutlation postcard distribution area (Source: Astrolabe, 2021)

5.2.2.1 Community engagement outcomes

Online community information session:

One local industry representative attended the online community information session held on 8 September 2021. The project team presented a summary of the proposal's plans and provided the attendee with an opportunity to ask a panel of technical advisors any questions.

The attendee noted that they had no concerns or comments in relation to the proposal, although did engage in discussion with the panel.

Some key points from the discussion included the attendee noting:

- interest in the proposed Sovereign Cyber Security Centre of Excellence, asking whether its operations would attract additional knowledge intensive workers (as data centres are traditionally 'technology heavy, people light'). The project team responded noting that whilst the Cyber Security Centre would not necessarily employ a significant number of workers, the data centre is proposing commercial office space as part of its plans to attract more skilled workers
- previous involvement with MDC via its existing data centre, commenting that they are a good local contributor, namely through Uniting Way
- ongoing collaboration between MDC and the broader innovation district and ecosystem would be welcome, particularly to explore opportunities for knowledge sharing and expertise building when in operation
- curiosity regarding the incorporation of sustainability in the proposal's plans. The project team responded noting its commitment to ecologically sustainable development principles throughout the design, construction, and operation phases.

5.2.3 Next Engagement Steps

MDC is committed to continued engagement with the local resident community, businesses, and key stakeholders to insure they remain informed about the proposals plans.

Engagement will continue to be undertaken in line with any requirements as part of the planning approvals process.

In particular, and as mentioned within **Section 3.2.1.3** of this EIS, the proponent is continuing the consult with Council during the assessment process. The remaining matters for discussion revolve around the possible realignment of future stormwater easement, as per **Section 6.1.9.2** of this EIS.

At the time of writing this EIS, it is expected that another meeting will be held with Council officers towards the end of November 2021, to discuss the planning and commercial aspects of the proposed stormwater easement realignment, which should then be resolved to present to NSW DPIE.

Matters to be closed out with Council prior to the determination of this application include:

- The arrangement of VPAs, as necessary; and
- The provision of future stormwater easement alignment, as documented in **Section 6.1.9.2** of this EIS.

MDC is committed to working with Council to reach an equitable arrangement for the above matters.

PART F ENVIRONMENTAL RISK ASSESSMENT

6.1 SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

The SEARs (reference: SSD-24299707) issued by the NSW DPIE on 12 August 2021 identify the following key issues:

1. Statutory and strategic context
2. Suitability of the site
3. Community and stakeholder engagement
4. Back-up power system
5. Noise and vibration
6. Air quality
7. Traffic and transport
8. Hazard and risk
9. Infrastructure requirements
10. Soil and water
11. Flood risk
12. Urban design and visual
13. Ecologically sustainable development
14. Greenhouse gas and energy efficiency
15. Biodiversity
16. Aboriginal cultural heritage
17. Non-Aboriginal cultural heritage
18. Socio-economic
19. Waste
20. Planning agreement/development contributions

The abovementioned matter(s), and other necessary matters, are addressed in the following section(s).

6.1.1 Statutory and strategic context

This section of the EIS evaluates the statutory and strategic context of the proposed development, in relation to the SEARs and addresses its specific matters.

In response to item 1. Statutory and strategic context of the SEARs, **TABLE 28** specifies the location of each assessment of the relevant statutory and strategic documents.

TABLE 28: STATUTORY AND STRATEGIC CONTEXT DOCUMENTS

Document	Response / Location of Assessment
justification for the proposal and the suitability of the site	Refer to **Section 6.1.2** of this EIS.
detailed justification that the proposed land use is permissible with consent	Refer to **Section 4.3.7** and **Section 6.1.2** of this EIS.
detailed description of the history of the site, including the relationship between the proposed development and LDA2018/0322, LDA2010/0671, and all other development consents and approved plans previously and/or currently applicable to the site	Refer to **PART B** of this EIS.
demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, adopted precinct plans, draft district plan(s) and adopted management plans and justification for any inconsistencies. This includes, but is not limited to:	Refer to **PART D** of this EIS.

TABLE 28: STATUTORY AND STRATEGIC CONTEXT DOCUMENTS	
Document	**Response / Location of Assessment**
▪ *State Environmental Planning Policy (Infrastructure) 2008*	Refer to **Section 4.3.7** of this EIS.
▪ *State Environmental Planning Policy (State and Regional Development) 2011*	Refer to **Section 4.3.6** of this EIS.
▪ *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development*	Refer to **Section 4.3.8** of this EIS.
▪ *State Environmental Planning Policy No. 55 – Remediation of Land*	Refer to **Section 4.3.9** of this EIS.
▪ *The Greater Sydney Region Plan: A Metropolis of Three Cities*	Refer to **Section 4.4.1** of this EIS.
▪ *Our Greater Sydney 2056: North District Plan*	Refer to **Section 4.4.2** of this EIS.
▪ *Future Transport Strategy 2056*	Refer to **Section 4.4.3** of this EIS.

6.1.2 Suitability for the site

This section of the EIS evaluates the suitability of the site for the proposed development, in relation to the SEARs and addresses its specific matters:

- ***detailed justification that the site can accommodate the proposed development, having regard to the scope of the operations of the existing facility and its environmental impacts and relevant mitigation measures.***
- ***an analysis of site constraints.***

In response to item 2. of the SEARs, a detailed analysis of the site's suitability is included in **Section 2.6** of this EIS.

The subject site is located within an established commercial area and is zoned B7 Business Park under RLEP2014. The proposed development will facilitate the use of the subject site for data storage, which is consistent with the zoning, pursuant to the ISEPP, and the surrounding context. The subject site, within Macquarie Park Corridor and in proximity to major arterial roads, serves as being ideal for growth of digital economy services.

Accordingly, the subject site is considered to be suitable for the proposed development and is consistent with the aims and objectives of the B7 Business Park zone, in that it seeks to facilitate employment generating development that responds to the characteristics of the land and is compatible with surrounding land uses.

The subject site is suitable for the size and scale of the development proposed and represents a quality outcome for the Macquarie Park Corridor.

In summary, the subject site is highly-suited to accommodate the intended development based on the following factors:

- ISEPP allows for the proposed development as a permissible use;
- The site is readily accessible via the regional road network;
- The proposed development is compatible with surrounding development and local context;
- The subject site can be serviced and at no cost to Government;
- The proposed development causes minimal impact on the environment;
- The site will complement functions of the wider Macquarie Park Corridor; and
- The proposed built form is designed to mitigate any impacts on surrounding properties.

Accordingly, the EIS prescribes recommendations and mitigation measures (where necessary), to account for all identified potential impacts, by the proposed development. The suitability of the subject site to cater for the proposed development, can be attributed to:

- its ability to provide employment,
- its excellent access arrangements,

- its suitable contextual setting, and
- its minimal impact on the environment.

The subject site's consistency with applicable regional and local strategies is demonstrated in the comprehensive environmental assessment, provided in **PART F** of this EIS, including an analysis of all potential impacts, which has been informed by the relevant consultant reports. Accordingly, the environmental assessment prescribes recommendations and mitigation measures (where necessary), to account for all identified potential impacts, by the proposed development. The suitability of the subject site with regard to the proposed development, can be attributed to its ready ability to provide much needed services to the digital economy, its excellent access arrangements, its suitable contextual setting, and its minimal impact on the environment.

6.1.3 Community and stakeholder engagement

This section of the EIS evaluates the community and stakeholder engagement for the proposed development, in relation to the SEARs and addresses the following specific matters.

- ***a community and stakeholder participation strategy identifying key community members and other stakeholders;***
- ***details and justification for the proposed consultation approach(s);***
- ***clear evidence of how each stakeholder identified in the community and stakeholder participation strategy has been consulted;***
- ***issues raised by the community and surrounding landowners and occupiers;***
- ***clear details of how issues raised during consultation have been addressed and whether they have resulted in changes to the development;***
- ***details of consultation regarding the design of the development and its relationship to existing on-site stormwater infrastructure and easements, including evidence of consultation with City of Ryde Council (Council); and***
- ***details of the proposed approach to future community and stakeholder engagement based on the results of consultation.***

Astrolabe Group has prepared a Community and Stakeholder Engagement Report to demonstrate the consultation outcomes that support the proposed SSD, which is included in **Appendix 5** of this EIS.

Section 5.2 of this EIS should be consulted for the strategies and findings of the community and stakeholder engagement undertaken to date.

6.1.4 Back-up power system

This section of the EIS provides further details relating to the proposed back-up power system, as requested by the SEARs, addressing the following specific matters.

- ***a detailed justification for the chosen back-up power system, including:***
  - ***a comprehensive assessment of alternative, commercially available technologies (solar power/large-scale batteries, hydrogen cells, etc);***
  - ***demonstration of a commitment to continual improvement with respect to the design of the back-up power system and its associated emissions;***
- ***a detailed overview of the proposed back-up generator system (if chosen), including:***
  - ***number and individual capacity of each generator (in terms of megawatts and megajoules per second);***
  - ***maximum operating time during a power outage event; and***
  - ***testing procedure (including whether testing will be carried out individually or in clusters), frequency and duration (including confirmation and, if necessary, justification of the need to test during the evening or night-time period).***

The following summary on Best Available Technology (BAT) aims to outline the technical background, basis and justification for the selection and operation of equipment that forms the backup installation at the MDC IC3w development.

IC3w will be designed, constructed and operated to 'meet the needs of corporate, government and multi-national customers and enhance NSW cybersecurity infrastructure and capabilities'.

In order to operate successfully the data centre will be required to demonstrate it can provide sufficient operational resilience such that in the event of a failure, crisis or catastrophic event IC3w can continue to operate and maintain normal business operation in accordance with agreed business arrangements.

The IC3w data centre is therefore considered to be a Critical Site. The data centre will be designed to meet an Uptime Institute Tier III resilience standard. The Tier III standard specifically details the resilience levels required in such Critical Sites.

6.1.4.1 Summary

The design intention is to supply the development with redundant utility feeds, each rated at 45MW, each diversely routed and connected to Ausgrid electricity grid points, ultimately with each sharing a proportion of the overall load. Should one supply fail, or if there is a complete failure of power in the area, it is then expected that the on-site power generation would be used to provide whatever load is required by the building.

Internally in the building, there are Uninterruptible Power Supply (UPS) systems that are able to keep the IT systems running while the generators are started, which could be a few minutes. Clearly the choice of power generator system is critical to the end user's ability to demonstrate that they have mitigated as many of the risks of power supply failure as possible.

Having a high level of operational resilience is essential to be able to demonstrate that the operator has a robust power management system to maintain business as usual when experiencing external utility failures.

The design concluded that the most suitable option for the IC3w data centre power generation therefore was the use of reciprocating engines capable of running on diesel and in the future bio fuel when commercially available.

6.1.4.2 Alternate considerations

Across the globe alternative approaches have been trialled and reflect local environmental and operational features these include:

- Alternate Grid scale support through the use of a minimum of three (3) alternate grid level supplies to site. This approach is not viable for this project due to the limited availability of redundant grid scale network and the requirement to ensure reliability during maintenance and failure scenarios where one or more feeders are out of service for maintenance for prolonged periods.
- Solar Battery. Due to the energy density of the data centre, operational space for solar arrays at the required capacity of 45MW precludes the use of Photovoltaic battery storage as a commercially viable option. Site location and space constraint dictate the site will not be suitable to provide the area required to meet the space requirements for the solar array and battery. Grid scale batteries of this capacity are currently experimental and located in large flat and largely unpopulated areas.
- The design considered a number of sources of fuel for the generation of power, this was quickly reduced to looking at only diesel oil and natural gas as feasible sources of fuel for the installation. The impact of storing fuel on site has also been considered in terms of spatial fit, risk and fire impact.
- The design process concluded at an early stage that due to the inherent risks and special constraints, that the on-site storage of natural gas should not be considered and the volume of stored diesel fuel should be kept to a reasonable minimum.
- Natural gas turbines have been dismissed, primarily due to their poor start up times and their inability to accept dynamic load changes easily.
- Options having a mix of engine types were also rejected due to their complexity and concern over overall resilience.

6.1.4.3 Backup system description

The backup generators selected will provide a source of reliable backup power designed to meet the data centre capacity requirement, to ensure business critical systems continue to operate during loss of the Ausgrid network utility supply.

The proposed generator specifications are provided in **TABLE 29**.

TABLE 29: DIESEL GENERATOR SPECIFICATIONS

Parameter	Units	Proposed for IC3w
Model	-	20V4000G94F
Number	-	18
Electrical generation capacity: individual	kW	3,306
Electrical generation capacity: combined[a]	MW	59.5
Fuel rate: individual	L/h	ND
NO_x	g/kW	9.65
CO	g/kW	0.52
PM	g/kW	0.023
NO_x in-stack concentration	mg/Nm^3	2,402[b]
	mg/Nm^3 @ 5% O_2	3,430
CO in-stack concentration	mg/Nm^3	127
	mg/Nm^3 @ 5% O_2	181
PM in-stack concentration	mg/Nm^3	5.7
	mg/Nm^3 @ 5% O_2	8.2

Notes:
ND No data
a Greater than the POEO Act & Amendment Act 2011 criteria used to define a scheduled activity under Clause 17 Electricity Generation. However, as the emergency standby plant is anticipated to operate less than 200 hours per year, this clause does not apply.
b It is noted that the anticipated maximum in-stack NOX concentration exceeds the 450 mg/m3 Protection of the Environment Operations (Clean Air) Regulation 2010 Group 6 limit. However, as the emergency standby plant is anticipated to operate less than 200 hours per year, it is exempt from these limits under the Regulation.

The function of power generation is more complex than on first viewing, there are a number of factors that have to be taken into account such as:

- The start-up period has to be in the order of 1 or 2 minutes to ensure that the UPS and cooling systems are resupplied. Although batteries are provided to the UPS systems these are typically only sized for a short period otherwise space and Health and Safety risk both become significant. In addition, the loss of power to cooling systems causes equipment rooms and data halls to rise above temperature limits within a few minutes if power is not resupplied to the chillers within the building.
- Following a mains utility complete or partial failure, the generators have to deal with electrical loads that are not stable as plant and equipment are brought back onto the building.
- Chilling equipment and UPS systems represent the largest proportions of load, which could be in the order of multiple megawatts. The generator system therefore has to be able to deal with dynamic and changing loads particularly for the first 60 minutes following a mains failure.
- The variable load on the building over the annual season. The generators therefore have to be of a size that matches the load.

The IC3w diesel generators support the entire building load when the utility supply is not available. They are designed to meet the data centre continuous power rating and will be configured to work in parallel.

In final configuration there will be 18 generators each rated at 3.0MW / 3.75KVA and designed to support the final full IT load deployed within the data centre. Power transfers between the utility supply and the diesel generators will be a break before make transfer with transfer of load back from generators to utility using a 'closed transition' in compliance with Ausgrid requirements.

The generators will be served by a dedicated fuel system fed from 4 above-ground bulk fuel storage tanks to support 48 hours fuel storage. Bulk tanks will be 4 hour fire rated tanks. Each bulk tank will have a dedicated fill point and laundering system.

The fuel distribution from the bulk tanks to each diesel generator will be concurrently maintainable.

6.1.4.4 Testing and emergency backup use

The generators will be subject to scheduled maintenance activity and will be tested during business hours Monday to Friday. The maintenance testing schedule will be quarterly with runtime for each individual engine less than half an hour. In addition, generators are tested individually with one annual load bank test for each generator taking approximately 1 hour.

The generators are scheduled to operate on the loss of mains utility. The site is supported by two substations and power loss at the site is uncommon.

TABLE 30 provides the proposed testing regime for which this AQIA is based.

TABLE 30: PROPOSED GENERATOR TESTING REGIME

Parameter	Value
No. of generators	34 (inclusive of 16 existing and 18 proposed)
Test of frequency per generator	Quarterly
Run time per test	60 minutes
No. of generators per test	1 – 5
Number of tests per day	8
Testing schedule	Monday to Friday (9:00 am to 4:00 pm)
Total testing time for all generators	132 hours per annum (based on 1 generator per test)

As outlined in **TABLE 30**, testing of generators is proposed to be conducted for 60 minutes between 9:00 am to 4:00 pm, Monday to Friday. No more than five generators will be tested per day and the five generators will not necessarily be tested concurrently, noting that in previous discussions with the EPA on annual operating hours of diesel generators, they have indicated that time spent testing more than one generator concurrently will be counted once, i.e. not hours multiplied by number of generators running. The total test time for all generators (existing and proposed) is therefore estimated to be 132 hours or less per year.

Major power interruptions requiring the simultaneous operation of all standby generators would only occur very infrequently and for a limited time period.

6.1.5 Noise and vibration

This section of the EIS evaluates the noise and vibration aspects of the proposed development, in relation to the SEARs and addresses the following specific matters:

- ***a quantitative noise and vibration impact assessment undertaken by a suitably qualified acoustic consultant in accordance with the relevant Environment Protection Authority guidelines and Australian Standards which includes:***
  - ***the identification of impacts associated with construction, site emission and traffic generation at noise affected sensitive receivers (including consideration of cumulative impacts from the existing data centre and surrounding***

developments), including the provision of operational noise contours and a detailed sleep disturbance assessment.

- ***details of noise monitoring survey, background noise levels, noise source inventory and 'worst case' noise emission scenarios.***
- ***consideration of annoying characteristics of noise and prevailing meteorological conditions in the study area.***
- ***adequate modelling of site operational noise and vibration sources such as cooling system fans and motors in proposed locations, energy back-up systems such as generator engines, and vehicle access, traverse, and manoeuvring paths***
- ***details and analysis of the effectiveness of proposed management and mitigation measures to adequately manage identified impacts, including a clear identification of residual noise and vibration following application of mitigation these measures and details of any proposed compliance monitoring programs.***

In response to the SEARs items relating to noise and vibration, the following information is presented by Renzo Tonin & Associates in their Noise and Vibration Assessment, which forms part of **Appendix 14** of this EIS.

The Noise and Vibration Assessment objectives are to determine the potential levels of noise and vibration at sensitive receivers located near the subject site and determine the levels of mitigation that would be required to enable compliance with the current NSW requirements.

In undertaking the assessment, unattended noise monitoring was conducted to measure noise from the existing acoustic environment and potential noise sources. Three-dimensional (3D) noise modelling software was used to create a noise model of the proposal to predict noise levels and assess the need for noise mitigation. For operational noise, cumulative impacts from the existing data centres (IC2 and IC3e) were accounted for.

6.1.5.1 Nearest sensitive receivers

This site is surrounded by commercial premises to the north, east and west and an education premises to the south. The nearest residential receivers are located north of the M2 Motorway, approximately 310 m from the site.

The extent of receiver buildings that have been included in the assessment modelling for the operational and construction noise assessment are presented in **Figure 29**. For the purpose of reporting a set of representative receiver locations are presented in this assessment.

Additionally, as the existing acoustic environment varies at the nearby residential receivers, these residential receivers have been grouped into Noise Catchment Areas (NCAs) based upon areas with similar acoustic environments. This has been done to logically group the receivers to assist with the assessment and allocate the appropriate project noise trigger levels or management levels to each receiver.

The locations of the representative receiver points are presented in **TABLE 31** and **Figure 29**.

TABLE 31: REPRESENTATIVE RECEIVER LOCATIONS

Receiver No.	Address/Location	Type	Residential NCA	Distance to Subject Site (approx. m)
R1	1-15 Fontenoy Road, Macquarie Park	Residential	1	350
R2	25 Fontenoy Road, Macquarie Park	Residential	1	310
R3	7 Tasman Place, Macquarie Park	Residential	1	320
R4	101 Waterloo Road, Macquarie Park	Residential	2	470
R5	80 Waterloo Road, Macquarie Park	Residential	2	490
R6	384-386 Lane Cove Road, Macquarie Park	Residential	2	500

TABLE 31: REPRESENTATIVE RECEIVER LOCATIONS				
Receiver No.	**Address/Location**	**Type**	**Residential NCA**	**Distance to Subject Site (approx. m)**
R7	136 Epping Road, North Ryde	Residential	3	635
R8	34-41 Waterloo Road, Macquarie Park (Only About Children Macquarie Park Station)	Childcare	-	220
R9	Building B/11 Talavera Road, Macquarie Park (Macquarie Early Learning Centre)	Childcare	-	130
R10	24 Talavera Road, Macquarie Park (North Ryde Early Learning Centre)	Childcare	-	110
R11	40-52 Talavera Road, Macquarie Park (Guardian Childcare)	Childcare	-	160
R12	97 Waterloo Road, Macquarie Park (Greenwood North Ryde)	Childcare	-	390
R13	63-71 Waterloo Road, Macquarie Park (Excelsia College)	Education	-	Adjacent
R14	44 Waterloo Road, Macquarie Park (Macquarie University (School of Engineering)	Education	-	225
R15	17 Khartoum Road, Macquarie Park (WiSE Specialist Emergency Clinic)	Medical	-	140
R16	7/11 Talavera Road, Macquarie Park (Marriot Hotel)	Hotel/motel	-	270
R17	88 Talavera Road, North Ryde (Meriton Suites)	Hotel/motel	-	680
R18	10 Byfield St, Macquarie Park (Holiday Inn Express)	Hotel/motel	-	550
R19	15 Talavera Rd, North Ryde	Commercial	-	Adjacent
R20	11 Talavera Rd, Macquarie Park	Commercial	-	Adjacent
R21	11-17 & 39 Khartoum Road, Macquarie Park	Commercial	-	60
R22	1-5 Khartoum Road, Macquarie Park	Commercial	-	Adjacent

6.1.5.2 Noise monitoring

Noise measurements are ideally carried out at the nearest or most potentially affected locations surrounding a development. An alternative, representative location should be established in the case of access restrictions or if a safe and secure location cannot be identified. Furthermore, representative locations may be established in the case of multiple receivers as it is usually impractical to carry out.

At the time of preparing the Noise and Vibration Assessment, the current COVID-19 situation and the current lockdowns within Greater Sydney were both impacting the existing noise environment and were restricting the possibility of undertake noise monitoring for the purposes of establishing background noise levels. As the existing noise environment is often controlled by road traffic noise or urban activities (ie. M2 Motorway), these noise levels would not be representative of a typical situation and so not suitable for the purposes of establishing background noise levels in accordance with the NPfI.

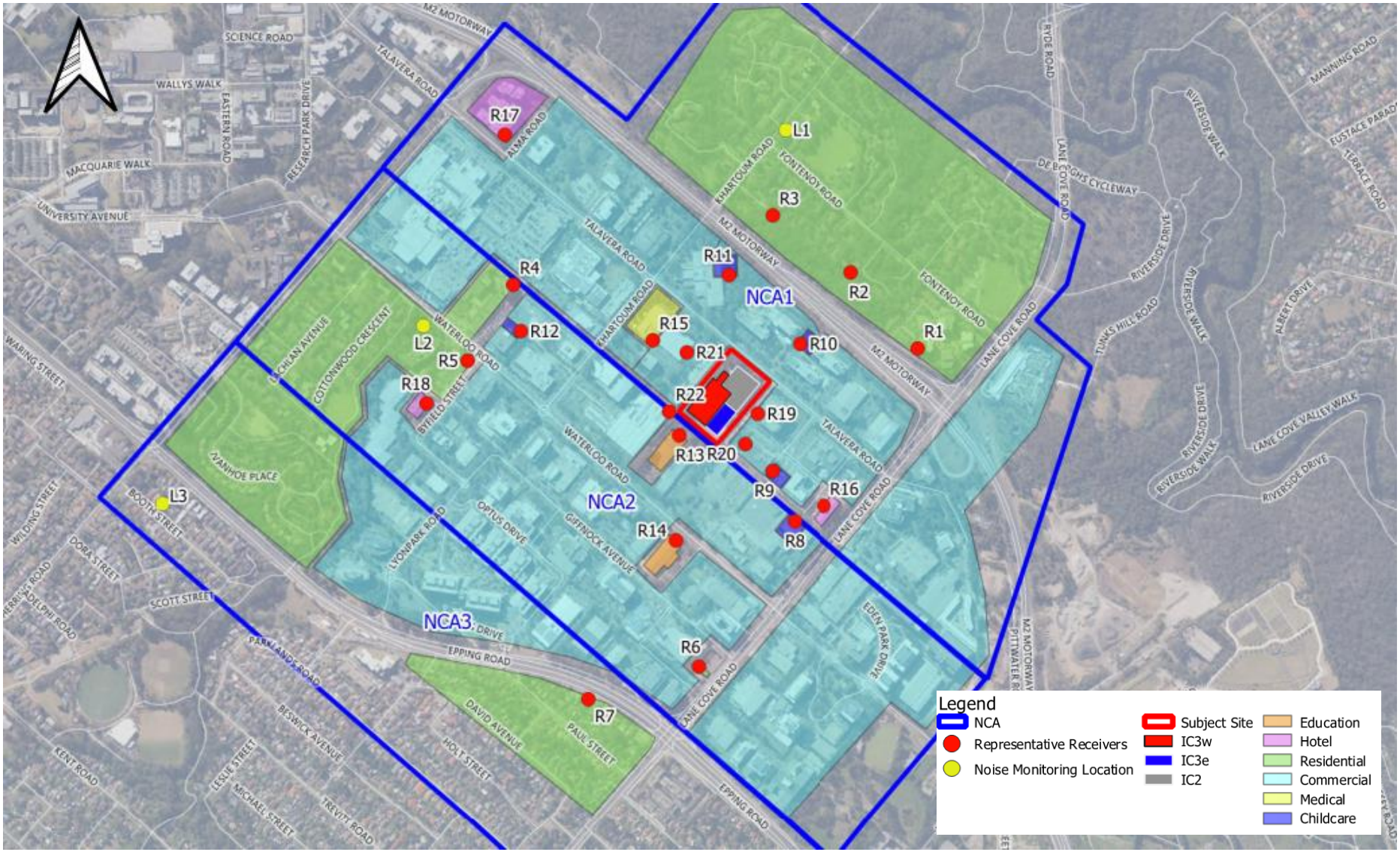


Figure 29 Representative receivers and noise monitoring locations (Source: Renzo Tonin, 2021)

As such, the noise assessment has relied on noise measurement data collected by Renzo Tonin in 2016 and noise data presented within the AECOM prepared *Macquarie Park Data Centre - Environmental Impact Statement – Appendix J Noise and Vibration Assessment'* (reference: 60628128-RPNV-02, Revision B, dated 9 November 2020) (EIS 2020). The EIS 2020 was sourced via the NSW DPIE Planning Portal and was prepared for 11-17 Khartoum Road and 33-39 Talavera Road, Macquarie Park, which is located in proximity to the subject site.

The long-term measurement locations are outlined in **TABLE 31** and **Figure 29** above.

TABLE 32: NOISE MONITORING LOCATIONS

ID	Source	Address	Monitoring Period	Description
L1	EIS 2020	Unit 6, 37 Khartoum Road, Macquarie Park	10/03/2020 - 20/03/2020	The monitor was located in the front garden of the property. The noise monitoring location is considered representative of receiver locations within NCA 1.
L2	Renzo Tonin	82 Waterloo Road, Macquarie Park	15/09/2016 - 22/09/2016	The monitor was located in the free field near the northern boundary facing Waterloo Road The noise monitoring location is considered representative of receiver locations within NCA 2.
L3	EIS 2020	7 Booth Street, Marsfield	10/03/2020 - 20/03/2020	The monitor was located in the front garden of the property. The noise monitoring location is considered representative of receiver locations within NCA 3.

TABLE 33 presents the overall single Rating Background Levels (RBL) and representative ambient L_{eq} noise levels for each assessment period.

TABLE 33: LONG-TERM NOISE MONITORING RESULTS

Monitoring Location	LA90 Rating Background Level (RBL)			LAeq Ambient noise levels		
	Day[1]	Evening[2]	Night[3]	Day[1]	Evening[2]	Night[3]
L1 - Unit 6, 37 Khartoum Road, Macquarie Park	45	45	38	57	59	51
L2 - 82 Waterloo Road, Macquarie Park[4]	52	48	40	61	60	54
L3 -7 Booth Street, Marsfield	42	42	33	55	56	47

Notes:
1. Day: 07:00-18:00 Monday to Saturday and 08:00-18:00 Sundays & Public Holidays
2. Evening: 18:00-22:00 Monday to Sunday & Public Holidays
3. Night: 22:00-07:00 Monday to Saturday and 22:00-08:00 Sundays & Public Holidays
4. As required by the NPfI, the external ambient noise levels presented are free-field noise levels. [ie. no façade reflection]

6.1.5.3 Construction noise levels

The *NSW Interim Construction Noise Guideline* (ICNG, 2009) provides guidelines for assessing noise generated during the construction phase of developments.

The key components of the guideline that are incorporated into this assessment include:

- Use of LA_{eq} as the descriptor for measuring and assessing construction noise.
- Application of reasonable and feasible noise mitigation measures.

- As stated in the ICNG, a noise mitigation measure is feasible if it is capable of being put into practice and is practical to build given the project constraints.
- Selecting reasonable mitigation measures from those that are feasible involves making a judgement to determine whether the overall noise benefit outweighs the overall social, economic and environmental effects.

The ICNG provides two methods described for the assessment of construction noise, being either a quantitative or a qualitative assessment. A quantitative assessment is recommended for major construction projects of significant duration and involves the measurement and prediction of noise levels and assessment against set criteria. A qualitative assessment is recommended for small projects
with duration of less than three weeks and focuses on minimising noise disturbance through the implementation of reasonable and feasible work practices, and community notification. Given the scale and duration of the construction works proposed, a quantitative assessment is carried out herein,
consistent with the ICNG requirements.

TABLE 34 reproduced from the ICNG, sets out the airborne noise management levels and how they are to be applied for residential receivers.

TABLE 34: NOISE MANAGEMENT LEVELS AT RESIDENTIAL RECEIVERS

Time of day	**Management Level L_{Aeq} (15 min) ***	**How to apply**
Recommended standard hours: Monday to Friday - 7am to 6pm Saturday - 8am to 1pm No work on Sundays or public holidays	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured LAeq (15 min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: - times identified by the community when they are less sensitive to noise (such as before/ after school for works near schools, or mid-morning or mid-afternoon for works near residences - if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

TABLE 34: NOISE MANAGEMENT LEVELS AT RESIDENTIAL RECEIVERS		
Time of day	**Management Level L_{Aeq} (15 min) ***	**How to apply**
Outside recommended standard hours	Noise affected RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5dB(A) above the noise affected level, the proponent should negotiate with the community. • For guidance on negotiating agreements see *ICNG* section 7.2.2.
* Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 metres above ground level. If the property boundary is more than 30 metres from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 metres of the residence. Noise levels may be higher at upper floors of the noise affected residence.		

TABLE 35 sets out the ICNG noise management levels for other noise sensitive receiver locations.

TABLE 35: NOISE MANAGEMENT LEVELS AT OTHER NOISE SENSITIVE LAND USES			
Land use	**Time of day**	**Where objective applies**	**Management Level L_{Aeq} (15 min)**
Classrooms at schools and other educational institutions	When in use	Indoor noise level Outdoor noise level[1]	45 dB(A) 65 dB(A)
Hospital wards and operating theatres	When in use	Indoor noise level Outdoor noise level[1]	45 dB(A) 65 dB(A)
Places of worship	When in use	Indoor noise level Outdoor noise level[1]	45 dB(A) 65 dB(A)
Active recreation areas	When in use	Outdoor noise level	65 dB(A)
Passive recreation areas	When in use	Outdoor noise level	60 dB(A)
Commercial premises	When in use	Outdoor noise level	70 dB(A)
Industrial premises	When in use	Outdoor noise level	75 dB(A)
Notes: 1. Outdoor noise level based on internal noise level in ICNG and assumes 20 dB loss through a closed window			

TABLE 36 presents the construction noise management levels established for the nearest noise sensitive residential receivers based upon the noise monitoring outlined in **Section 6.1.5.2** above.

TABLE 36: CONSTRUCTION NOISE MANAGEMENT LEVELS			
ID	**Location Description**	**Noise management level LAeq(15min)[1]**	
		ICNG Standard Hours	**ICNG Outside Standard Hours**
NCA1	Residential premises	55	50[4]

TABLE 36: CONSTRUCTION NOISE MANAGEMENT LEVELS			
ID	**Location Description**	**Noise management level LAeq(15min)[1]**	
		ICNG Standard Hours	**ICNG Outside Standard Hours**
NCA2	Residential premises	62	57[4]
NCA3	Residential premises	52	47[4]
R8 – R12	Childcare centre - classroom (external)	65[2,3]	-
R13 – R14	Childcare centre - playground	65[2]	-
R15	Education - classroom (external)	65[2,3]	-
R16 – R22	Medical - operating theatres (external)	65[2,3]	-

Notes:
1. Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5m above ground level. If the property boundary is more than 30m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30m of the residence. Noise levels may be higher at upper floors of the noise affected residence.
2. Noise management levels apply when receiver areas are in use only.
3. External noise management level. A conversion from internal to external assumes 20 dB(A) loss from outside to inside through a closed window.
4. Noise management levels based on daytime RBL. A visual review of the long-term noise monitoring data reveals LA90 levels from 6:00am to 7:00am and 6:00pm to 7:00pm Mondays to Friday; 6:00am to 7:00am Saturday; and 7:00am to 8:00am Sunday are typically louder than the quietest part of the day.

6.1.5.4 Construction vibration levels

Construction vibration is associated with three main types of impact:

- disturbance to building occupants
- potential damage to buildings, and
- potential damage to sensitive equipment in a building.

Generally, if disturbance to building occupants is controlled, there is limited potential for structural damage to buildings. Vibration amplitude may be measured as displacement, velocity, or acceleration.

The acceptable vibration values to assess the potential for human annoyance from vibration are set out in the NSW 'Environmental Noise Management Assessing Vibration: A Technical Guideline' (AVTG).

The initial screening test values and Vibration Dose Values (VDVs) recommended in BS 6472-1992 for which various levels of adverse comment from occupants may be expected, are presented in **TABLE 37**. The 'Low probability of adverse comment eVDV' represent the preferred and maximum value presented in the AVTG.

TABLE 37: VIBRATION MANAGEMENT LEVELS FOR DISTURBANCE TO BUILDING OCCUPANTS				
Place and Time	**Initial screening test Velocity, PEAK, mm/s (>8Hz)**	**Low probability of adverse comment eVDV m/s$^{1.75}$**	**Adverse comment possible eVDV m/s$^{1.75}$**	**Adverse comment probable eVDV m/s$^{1.75}$**
Critical areas (day or night)[1]	0.28	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8
Residential buildings 16 hr day[2]	0.56	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6

TABLE 37: VIBRATION MANAGEMENT LEVELS FOR DISTURBANCE TO BUILDING OCCUPANTS				
Place and Time	**Initial screening test Velocity, PEAK, mm/s (>8Hz)**	**Low probability of adverse comment eVDV m/s$^{1.75}$**	**Adverse comment possible eVDV m/s$^{1.75}$**	**Adverse comment probable eVDV m/s$^{1.75}$**
Residential buildings 8 hr night[2]	0.40	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8
Offices, schools, educational institutions and places of worship (day or night)	1.10	0.4 to 0.8	0.8 to 1.6	1.6 to 2.4
Workshops (day or night)	2.20	0.8 to 1.6	1.6 to 3.2	3.2 to 6.4
Notes: 1. Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. There may be cases where sensitive equipment or delicate tasks require more stringent criteria than the human comfort criteria specify above 2. Daytime is 7am to 10pm and night-time is 10pm to 7am				

Potential structural damage of buildings as a result of vibration is typically managed by ensuring vibration induced into the structure does not exceed certain limits and standards, such as British Standard 7385 Part 2 and German Standard DIN 4150-3. Currently there is no existing Australian Standard for assessment of structural building damage caused by vibration energy, as such British and German standards have been adopted.

6.1.5.5 Operational noise levels

This assessment aims to quantify the potential operational noise emissions from the Project in accordance with the NSW Noise Policy for Industry (NPfI) (EPA 2017). The assessment procedure has two components:

- Controlling intrusive noise impacts in the short-term for residences; and
- Maintaining noise level amenity for residences and other land uses.

Project noise trigger levels:

In accordance with the NPfI, noise impact should be assessed against the project noise trigger level which is the lower value of the project intrusiveness noise levels and project amenity noise levels.

Pursuant to the NPfI the project noise trigger levels, have been determined as shown in

TABLE 38: PROJECT NOISE TRIGGER LEVELS					
Receiver location		**Time of Day [1,2]**	**Intrusiveness noise level, $L_{Aeq,15min}$ dB(A)**	**Project amenity noise levels $L_{Aeq,\ 15min}$ dB(A)**	**$L_{Aeq,\ 15min}$ Project noise trigger levels, dB(A)**
Residential Receiver	NCA1	Day	50	58	50
		Evening	50	48	48
		Night	43	43	43
	NCA2	Day	57	58	57
		Evening	53	48	48
		Night	45	43	43

TABLE 38: PROJECT NOISE TRIGGER LEVELS					
Receiver location		**Time of Day** [1,2]	**Intrusiveness noise level, $L_{Aeq,15min}$ dB(A)**	**Project amenity noise levels $L_{Aeq,\ 15min}$ dB(A)**	**$L_{Aeq,\ 15min}$ Project noise trigger levels, dB(A)**
	NCA3	Day	47	53	47
		Evening	47	43	43
		Night	38	38	38
Hotels / motels		Day	-	63	63
		Evening	-	53	53
		Night	-	48	48
Childcare (external)[3]		Noisiest 1-hour period when in use	-	58	58
Childcare play area			-	53	53
School classroom (external)[3]		Noisiest 1-hour period when in use	-	58	58
School classroom (adjacent to site – R13) (external)[3]		Noisiest 1-hour period when in use	-	60	60
Hospital ward		Noisiest 1-hour	-	48	48
Commercial		When in use	-	63	63
Commercial Premises (adjacent to site - R19, R20 & R22)		When in use	-	65	65

Notes:
1. Daytime 7.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 7.00 am.
2. On Sundays and Public Holidays, Daytime 8.00 am - 6.00 pm; Evening 6.00 pm - 10.00 pm; Night-time 10.00 pm - 8.00 am
3. Conversion of trigger levels from internal to external for childcare and school classroom assumes 20 dB(A) loss from outside to inside through a closed window.
4. For a residence, the project noise trigger level and maximum noise levels are to be assessed at the reasonably most- affected point on or within the residential property boundary.
5. For commercial or industrial premises the noise level is to be assessed at the reasonably most-affected point on or within the property boundary.

Sleep disturbance noise levels:

The potential for sleep disturbance from maximum noise level events from premises during the night- time period needs to be considered. In accordance with NPfI, a detailed maximum noise level event assessment should be undertaken where the subject development night-time noise levels at a residential location exceed:

- LAeq,15min 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or
- LAFmax 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater.

Where there are noise events found to exceed the initial screening level, further analysis is undertaken to identify:

- The likely number of events that might occur during the night assessment period,
- The extent to which the maximum noise level exceeds the rating background noise level.

The sleep disturbance noise levels for the project are presented in **TABLE 39**.

TABLE 39: SLEEP DISTURBANCE ASSESSMENT LEVELS		
Receiver type	**Assessment Level $L_{Aeq,15min}$**	**Assessment Level L_{AFmax}**
NCA1	38 + 5 = 43	38 + 15 = 53
NCA2	40 + 5 = 45	40 + 15 = 55
NCA3	40	52

The night-time noise sources associated with the proposal are steady-state, and therefore there is unlikely to be significant variation between $L_{Aeq,15min}$ values and L_{AFmax} values, hence compliance with the more stringent project trigger noise level presented in Table 16 will result in compliance with the project's sleep disturbance criteria set out above.

Road traffic noise:

Noise impacts from the potential increases in traffic on the surrounding road network due to construction and operational activities from the proposalis assessed in accordance with the NSW Road Noise Policy (DECCW, 2011) (RNP). The RNP sets out criteria to be applied to particular types of road and land uses. These noise criteria are to be applied when assessing noise impact and determining mitigation measures for sensitive receivers that are potentially affected by road traffic noise associated with the construction and operation of the subject site, with the aim of preserving the amenity appropriate to the land use.

The proposalwill be using sub-arterial / arterial roads and not local roads. Therefore, for existing residences affected by additional traffic on existing sub-arterial / arterial roads generated by land use developments, the following RNP road traffic noise criteria would apply.

TABLE 40: RNP ROAD TRAFFIC NOISE CRITERIA			
Road Category	**Type of Project/Land Use**	**Assessment Criteria, dB(A)**	
		Day: 7am – 10pm	**Night: 10pm – 7am**
Freeway/arterial/sub-arterial roads	3. Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	LAeq,(15 hour) 60 (external)	LAeq,(9 hour) 55 (external)

Further to the above, the RNP states the following for land use developments generating additional traffic:

"For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use development, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding 'no build option'."

The RNP states that in assessing feasible and reasonable mitigation measures, an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person.

6.1.5.6 Construction and vibration assessment

Construction activities associated with the proposed development will result in increased noise levels during construction hours. The works undertaken in the various stages consist of a mixture of both high and low noise activities. This assessment identifies potentially noisy activities, their impacts on surrounding receivers and outlines management strategies to control the impacts of noise and vibration during the construction stages of the project.

Construction hours:

Construction works for the project are proposed to take place during and outside the ICNG standard construction hours, as summarised in **TABLE 12** of this EIS.

Receiver locations:

As detailed in **Section 6.1.5.1** above.

Construction assumptions:

Construction works and activities

An assessment of the potential level of construction noise and vibration impact has been carried out to determine whether mitigation would be required, and to determine appropriate management controls. Specific construction equipment requirements are not yet known. The type and number of plant and equipment associated with the proposed works was assumed based upon experience with similar noise assessments.

Prior to the commencement of construction, the final construction details should be reviewed against the assumptions in this report to ensure that the mitigation and management measures that will be implemented remain consistent with these assumptions, and appropriate for the project.

The approximate phases and duration of works are as follows:

4. Stage 1 – minor earthworks and civil works, including piling = 6 months
5. Stage 2 – construction of main building = 6 months
6. Stage 3 – deliveries and initial fitout of the data centre, including operational plant and equipment = 9 months

Construction traffic

The worksite will generate additional traffic movements in the form of:

- Light vehicle movements generated by construction personnel travelling to and from work
- Heavy vehicle movements generated by:
  - Delivery vehicles bringing raw materials, plant, and equipment to the site
  - Concrete trucks

Construction traffic on the site is included as part of the construction noise assessment of the work activities identified above. When construction-related traffic moves on the public road network, a different noise assessment methodology is appropriate as vehicle movements would be regarded as additional road traffic on public roads rather than as part of the construction site's activities.

Access to the site will be from Talavera Road. The estimated daily number of heavy vehicles accessing the site will be up to 20 trucks per day during peak periods or an average of two (2) per hour, over a standard 10 hour work day. This volume of truck traffic is not expected to significantly alter existing traffic noise. Furthermore, there are no residential receivers located along Talavera Road.

Construction traffic from the site on public roads is predicted not to be a significant noise impact and is not further addressed in this report.

Construction noise sources

The schedule of items of plant and equipment likely to be used during the construction phases of the proposal is presented in **TABLE 41**.

TABLE 41: TYPICAL CONSTRUCTION EQUIPMENT & SOUND POWER LEVELS

Plant item	Plant description	Estimated number of items	Sound power levels $L_{Aeq(15min)}$
Stage 1 - Minor earthworks and civil works			
1	Vibratory Roller	1	113[1]

2	Grader	1	109
3	Pilling Rig – Bored	1-2	108
4	Dump Trucks	1-2	108
5	Watercart	1	104
6	Excavator (35T)	1	103
7	Franna Crane	1-2	99
Stage 2 - Building construction			
8	Concrete trucks	2	108
9	Delivery trucks	2	108
10	Hand tools	Various	107
11	Mobile crane	1	105
12	Concrete pump	2	102
13	Concrete vibrator	4	99
14	Non-powered hand tools	Various	98
Stage 3 - Building fit-out			
15	Delivery trucks	2	108
16	Hand tools	Various	107
17	Bobcat	1	102
18	Scissor lift	2	99
19	Non-powered hand tools	Various	98
Note: 1. A 5 dB(A) penalty has been factored into the sound power level to allow for particularly annoying activities			

The sound power levels for the majority of construction plant and equipment presented in the above table are based on maximum noise levels given in Table A1 of Australian Standard 2436 - 2010 'Guide to Noise Control on Construction, Demolition and Maintenance Sites', the Interim Construction Noise Guideline (ICNG), information from past projects and/or information held in our library files.

Assessment of construction noise:

Noise levels at any receiver location resulting from construction works would depend on the location of the receiver with respect to the area of construction, shielding from intervening topography and structures, and the type and duration of construction being undertaken. Furthermore, noise levels at receivers would vary significantly over the total construction program due to the transient nature and large range of plant and equipment that could be used.

Noise emissions were determined by modelling the noise sources, receiver locations, and operating activities, based on the information presented in the above subsections.

Noise assessment

TABLE 42: PREDICTED LAeq(15min) NOISE LEVELS FOR TYPICAL CONSTRUCTION PLANT

Item	Plant description	Predicted $L_{Aeq(15min)}$ construction noise levels																	
		NCA1	**NCA 2**	**NCA3**	**R8**	**R9**	**R10**	**R11**	**R12**	**R13**	**R14**	**R15**	**R16**	**R17**	**R18**	**R19**	**R20**	**R21**	**R22**
NML (external) – Standard hours Mon-Fri – 7:00am to 6:00pm Sat – 8:00am to 1:00pm		55	62	52	65- classroom 65- playground					65		65	70						
NML (external) – Outside Standard hours Mon-Fri – 6:00am to 7:00am & 6:00pm to 7:00pm Sat – 6:00am to 8:00am & 1:00pm to 5:00pm Sun – 7:00am to 3:00pm		50	57	47															
Stage 1 - Minor earthworks and civil works																			
1	Vibratory Roller (6T)	29-50	46-50	32-43	27-47	31-38	31-56	39-58	42-45	55-69	25-45	52-56	27-35	37-41	38-42	38-56	36-53	62-67	59-71
2	Grader	25-46	42-46	28-39	23-43	27-34	27-52	35-54	38-41	51-65	21-41	48-52	23-31	33-37	34-38	34-52	32-49	58-63	55-67
3	Pilling Rig – Bored	24-45	41-45	27-38	22-42	26-33	26-51	34-53	37-40	50-64	20-40	47-51	22-30	32-36	33-37	33-51	31-48	57-62	54-66
4	Dump Trucks	24-45	41-45	27-38	22-42	26-33	26-51	34-53	37-40	50-64	20-40	47-51	22-30	32-36	33-37	33-51	31-48	57-62	54-66
5	Watercart	20-41	37-41	23-34	18-38	22-29	22-47	30-49	33-36	46-60	16-36	43-47	18-26	28-32	29-33	29-47	27-44	53-58	50-62
6	Excavator (35T)	19-40	36-40	22-33	17-37	21-28	21-46	29-48	32-35	45-59	15-35	42-46	17-25	27-31	28-32	28-46	26-43	52-57	49-61
7	Franna Crane	15-36	32-36	18-29	13-33	17-24	17-42	25-44	28-31	41-55	11-31	38-42	13-21	23-27	24-28	24-42	22-39	48-53	45-57
Three (3) noisiest plant operating concurrently		**31-53**	**49-53**	**35-45**	**29-49**	**34-40**	**33-59**	**41-60**	**44-48**	**57-71**	**27-47**	**54-59**	**29-38**	**40-43**	**41-45**	**41-58**	**38-56**	**65-70**	**61-73**
Stage 2 -Building construction																			
8	Concrete trucks	24-45	41-45	27-38	22-42	26-33	26-51	34-53	37-40	50-64	20-40	47-51	22-30	32-36	33-37	33-51	31-48	57-62	54-66
9	Delivery trucks	24-45	41-45	27-38	22-42	26-33	26-51	34-53	37-40	50-64	20-40	47-51	22-30	32-36	33-37	33-51	31-48	57-62	54-66

10	Hand tools	23-44	40-44	26-37	21-41	25-32	25-50	33-52	36-39	49-63	19-39	46-50	21-29	31-35	32-36	32-50	30-47	56-61	53-65
11	Mobile crane	21-42	38-42	24-35	19-39	23-30	23-48	31-50	34-37	47-61	17-37	44-48	19-27	29-33	30-34	30-48	28-45	54-59	51-63
12	Concrete pump	18-39	35-39	21-32	16-36	20-27	20-45	28-47	31-34	44-58	14-34	41-45	16-24	26-30	27-31	27-45	25-42	51-56	48-60
13	Concrete vibrator	15-36	32-36	18-29	13-33	17-24	17-42	25-44	28-31	41-55	11-31	38-42	13-21	23-27	24-28	24-42	22-39	48-53	45-57
14	Non-powered hand tools	14-35	31-35	17-28	12-32	16-23	16-41	24-43	27-30	40-54	10-30	37-41	12-20	22-26	23-27	23-41	21-38	47-52	44-56
Three (3) noisiest plant operating concurrently		**28-50**	**46-50**	**32-42**	**26-46**	**31-37**	**30-56**	**38-57**	**41-45**	**54-69**	**24-44**	**51-56**	**26-35**	**37-40**	**38-42**	**38-55**	**35-53**	**62-67**	**58-70**
Stage 3 - Building fit-out – External works or works prior to building fabric completion																			
15	Delivery trucks	24-45	41-45	27-38	22-42	26-33	26-51	34-53	37-40	50-64	20-40	47-51	22-30	32-36	33-37	33-51	31-48	57-62	54-66
16	Hand tools	23-44	40-44	26-37	21-41	25-32	25-50	33-52	36-39	49-63	19-39	46-50	21-29	31-35	32-36	32-50	30-47	56-61	53-65

TABLE 42 presents noise levels likely to be experienced at the nearby affected receivers based on the construction activities and plant and equipment associated with the proposed site. The noise level range presented represents the plant item operating at a location furthest from the receiver and a location closest to the receiver. Noise levels were calculated taking into consideration attenuation due to distance between the construction works and the receiver locations and any intervening structures. The noise predictions are conservative and do not incorporate acoustic shielding provided by hoarding. For the internal building Fit-out works, the predictions include a modest 20 dB(A) loss from outside to inside through the completed building fabric.

The worst affected receivers for are typically in the first row of houses/apartments back from the subject site, with direct line-of-sight to the construction work area. Receivers in the next row of houses/apartments back from the Project, or receivers without direct line-of-sight to the construction area would typically be exposed to construction noise levels 5 to 10 dB(A) lower than the levels predicted for the worst affected receivers.

Standard construction hours

The predicted noise levels presented above indicate that the noise levels during the three stages of construction are likely to achieve the NML at most of the nearby sensitive receivers and at all residential locations. At two receivers adjacent to the site R13 (Excelsia College - 63-71 Waterloo Road) and R22 (1- 5 Khartoum Road, Macquarie Park), there may be times when loud equipment or a number of concurrent construction activities may result in construction noise levels being over the NML, particularly when these activities are operating near to the corresponding receiver location.

In addition, no residential receivers are predicted to be highly noise affected (i.e., exposed to noise levels greater than 75 dB(A)).

In light of the predicted noise levels above, it is recommended that a feasible and reasonable approach towards noise mitigation measures be applied to reduce noise levels as much as possible to mitigate the impact from construction noise. Further details on construction noise mitigation and management measures are provided in **Section 6.1.5.7** below.

Outside standard construction hours - Period 1

Once Stage 1 (Minor Earthworks and Civil Works) is complete, Stage 2 (Building Construction) and Stage 3 (Building fit-out) are proposed to be undertaken during the defined Outside Standard Construction Hours Period 1 (OSH Period 1).

The predicted noise levels presented above indicate that the noise levels during these two stages of construction are likely to achieve the NML at all of the nearby sensitive receivers, including the residential locations. Predictions show that construction noise levels might be slightly above the noise management levels at R13 (Excelsia College - 63-71 Waterloo Road) but this receiver is not operational during this period.

It is recommended that a feasible and reasonable approach towards noise mitigation measures be applied to reduce noise levels as much as possible to mitigate the impact from construction noise. Further details on construction noise mitigation and management measures, including noise monitoring recommendations, are provided in **Section 6.1.5.7** below.

Outside standard construction hours - Period 2

Once Stage 1 (Minor Earthworks and Civil Works) and Stage 2 (Building Construction) is complete, certain Stage 3 (Building fit-out) works are proposed to be undertaken during the defined Outside Standard Construction Hours Period 2 (OSH Period 2).

During this period, the internal fit-out works will be restricted to hand tools only and only occur when the building fabric has been completed. In addition, there will be no external activities other than construction workers in light vehicles arriving/departing the site.

The predicted noise levels presented above indicate that the noise levels during these works are likely to be inaudible at the nearby sensitive receivers and/or the receivers will not be in use. The highest external prediction at each receiver type is outlined below. In addition, once losses from outside to inside are accounted for through open and closed windows, the predicted noise levels are minimal.

- Residential: 24dB(A)
- Childcare: 32dB(A)
- Education: 43dB(A)
- Medical: 30dB(A)
- Commercial: 45dB(A)

In regard to sleep disturbance from the light vehicles on site, based on a L_{Amax} sound power level of 97dB for engine starting/door closing, the maximum noise level prediction at the nearest residential receivers is less than 10dB(A). As such, the potential for sleep disturbance impacts is negligible.

It is recommended that a feasible and reasonable approach towards noise mitigation measures be applied to reduce noise levels as much as possible to mitigate the impact from construction noise. Further details on construction noise mitigation and management measures, including noise monitoring recommendations, are provided in **Section 6.1.5.7** below.

Assessment of construction vibration:

Minimum working distances

The pattern of vibration radiation is very different to the pattern of airborne noise radiation and is very site specific as final vibration levels are dependent on many factors including the actual plant used, its operation and the intervening geology between the activity and the receiver. Potential vibration generated at receivers for this project will be dependent on separation distances, the intervening soil and rock strata, dominant frequencies of vibration and the receiver building's construction and structure.

The recommended minimum working distances for vibration intensive plant are presented in **TABLE 43**.

TABLE 43: RECOMMENDED MIN. WORKING DISTANCES FOR VIBRATION INTENSIVE EQUIPMENT

Plant item	**Minimum working distance (m)**				
	Cosmetic damage		**Sensitive structures (e.g. heritage)[1]**	**Human disturbance**	
	Commercial and industrial buildings[1]	**Dwellings and similar structures[1]**		**Residences Day[2]**	**Offices**
Truck traffic (over irregular surfaces)	5	5	10	15	10
Excavator 35T (travelling / digging)	5	5	10	20	10
Piling Rig (bored)	5	5	10	15	10
Grader	5	5	10	20	10
Vibratory Roller 6T	5	15	20	40	20

Notes:
1. Vibration limits referenced from DIN 4150 Structural Damage - Safe Limits for Short-term Building Vibration.
2. Daytime is 7 am to 10 pm;

Site specific buffer distances for vibration significant plant items must be measured on site where plant and equipment is likely to operate close to or within the minimum working distances for cosmetic damage.

As previously identified, unlike noise, vibration cannot be 'predicted' due to many variables from site to site, for example soil type and conditions; sub surface rock; building types and foundations; and actual plant on site. The data relied upon in this assessment (tabulated above) is taken from a database of vibration levels measured at various sites or obtained from other sources (eg. BS 5228-2:2009). They are not specific to this project as final vibration levels are dependent on many factors including the actual plant used, its operation and the intervening geology between the activity and the receiver.

Potential vibration impacts

Based on the proposed plant items presented, vibration generated by construction plant was estimated and potential vibration impacts are summarised in **TABLE 44** below.

The assessment is relevant to the identified residential buildings and other similar type structures in the project area and has been assessed against the vibration limits DIN 4150-3:2016. Receivers R1 to R12 and R14 to R18 are located greater than 100m from the works and considered to have a low to negligible risk of vibration impact.

TABLE 44: POTENTIAL VIBRATION FOR RESIDENTIAL AND COMMERCIAL PROPERTIES					
Receiver location[1]	**Approx. distance to nearest buildings from works (m)**	**Group classification**	**Assessment on potential vibration impacts**		
			Structural damage risk	**Human disturbance**	**Vibration monitoring**
R13	50 m	Group 1 (commercial / industrial)	Very low risk of structural damage from construction works	Low risk of adverse comment as a result of construction works	Vibration monitoring not required
R19	65 m	Group 1 (commercial / industrial)	Very low risk of structural damage from construction works	Low risk of adverse comment as a result of construction works	Vibration monitoring not required
R20	90 m	Group 1 (commercial / industrial)	Very low risk of structural damage from construction works	Low risk of adverse comment as a result of construction works	Vibration monitoring not required
R21	80 m	Group 1 (commercial / industrial)	Very low risk of structural damage from construction works	Low risk of adverse comment as a result of construction works	Vibration monitoring not required
R22	35 m	Group 1 (commercial / industrial)	Very low risk of structural damage from construction works	Low risk of adverse comment as a result of construction works	Vibration monitoring not required
Note: 1. The sources of vibration levels is the vibratory roller 6T. If alternative equipment with higher vibration levels are used, there is an additional risk.					

Based on the above assessment for the receivers surrounding the site, there is a low risk of vibration impact. Nevertheless, potential vibration impacts should be reviewed during construction considering site specific buffer distances for vibration significant plant items where plant and equipment is likely to operate close to or within the minimum working distances for cosmetic damage at nearby vibration sensitive receivers, and recommendations for reducing or managing potential vibration impacts are provided in the following section.

6.1.5.7 Construction mitigation and management measures

The following recommendations provide feasible and reasonable noise control solutions to reduce noise impacts to sensitive receivers. A strong justification must be provided for not implementing the proposed measures if they are later determined on-site not to be feasible or reasonable.

The advice provided here is in respect of acoustics only. Supplementary professional advice may need to be sought in respect of fire ratings, structural design, buildability, fitness for purpose and the like.

General noise management measures:

The following general noise management measures are recommended for all receiver locations:

- Use less noisy plant and equipment, where feasible and reasonable.
- Plant and equipment must be properly maintained.

- Provide special attention to the use and maintenance of 'noise control' or 'silencing' kits fitted to machines to ensure they perform as intended.
- Strategically position plant on site to reduce the emission of noise to the surrounding neighbourhood and to site personnel.
- Avoid any unnecessary noise when carrying out manual operations and when operating plant.
- Any equipment not in use for extended periods during construction work must be switched off.
- Simultaneous operation of noisy plant within discernible range of a sensitive receiver is to be limited/avoided where possible.
- The offset distance between noisy plant and adjacent sensitive receivers is to be maximised where practicable.
- Plant used intermittently to be throttled down or shut down when not in use where practicable.
- Noise-emitting plant to be directed away from sensitive receivers where possible.
- Staging of construction works so as to erect solid external walls first and utilising them to provide noise shielding to the noise sensitive receivers. However, the structural integrity of the external walls should be investigated prior to implementing this measure and should be prioritised over the noise benefits.
- In addition to the noise mitigation measures outlined above, a management procedure will need to be put in place to deal with noise complaints that may arise from construction activities. Each complaint will need to be investigated and appropriate noise amelioration measures put in place to mitigate future occurrences, where the noise in question is in excess of allowable limits.
- Good relations with people living and working in the vicinity of a construction site should be established at the beginning of a project and be maintained throughout the project, as this is of paramount importance. Keeping people informed of progress and taking complaints seriously and dealing with them expeditiously is critical. The person selected to liaise with the community must be adequately trained and experienced in such matters.

Additional measures to be considered:

Other potential mitigation measures include:

- Use of broadband "quacker" type of reverse/movement alarms instead of the tonal 'beeping" type.
- All employees, contractors and subcontractors are to receive site induction and toolbox talks and ongoing training so that the above noise management measures are implemented accordingly. Content within toolboxes will include, location of nearest sensitive receivers; relevant project specific and standard noise and vibration mitigation measures; permissible hours of work, truck route and truck loading restrictions and construction employee parking areas.
- Consultation with Excelsia College (R13) (63-71 Waterloo Road, Macquarie Park), to inform consideration of appropriate feasible and reasonable noise management measures during noise intensive periods of construction.

Noise monitoring:

The following approach should be adopted with regard to noise monitoring procedures during the construction works.

- Where potential noise impacts are predicted to be 10dB(A) above the noise criteria during standard construction hours, the potential construction noise nuisance is considered to be moderate. Noise monitoring should be carried out to confirm predicted noise impacts within two weeks of commencement of construction. Reasonable and feasible noise reduction measures must be investigated, where necessary.
- Where potential noise impacts are predicted to be 5dB(A) above the noise criteria during outside of standard construction hours, noise monitoring should be carried out to confirm predicted noise impacts within two weeks of commencement of construction. Reasonable and feasible noise reduction measures must be investigated, where necessary.
- In the event of noise complaints, noise reduction measures (where reasonable and feasible) must be implemented and noise monitoring should undertaken to assist in managing noise levels.

Vibration mitigation measures:

The following vibration management measures are provided to minimise vibration impact from construction activities to the nearest affected receivers and to meet the relevant human comfort and building damage vibration limits:

1. A management procedure should be implemented to deal with vibration complaints. Each complaint should be investigated and where vibration levels are established as exceeding the set limits, appropriate amelioration measures should be put in place to mitigate future occurrences.
2. Where vibration is found to be excessive, management measures should be implemented to ensure vibration compliance is achieved. Management measures may include modification of construction methods such as using smaller equipment, establishment of safe buffer zones as mentioned above, and if necessary, time restrictions for the most excessive vibration activities. Time restrictions are to be negotiated with affected receivers.
3. Where construction activity occurs in close proximity to sensitive receivers, vibration testing of actual equipment on site should be carried out prior to their commencement of site operation to determine site- specific acceptable buffer distances to the nearest affected receiver locations.

Complaints management:

Noise and vibration levels generated by construction activities associated with the construction of the development must aim to comply with the noise and vibration goals set by the relevant regulations and guidelines.

Owners and occupants of nearby affected properties are to be informed by direct mail of a direct telephone line and contact person, where any noise and/or vibration complaints related to the operation of the construction activities are to be reported.

6.1.5.8 Operational noise assessment

Operational noise sources:

The noise sources associated with the operation of the Project are as follows:

- fixed mechanical plant, including emergency equipment (i.e. generators)
- staff vehicle movements and car parking
- loading dock activities

Mechanical equipment

Existing IC2 and IC3e:

In order to address cumulative impacts, equipment from the existing IC2 and IC3e data centres has been considered. Currently, IC2 is operating at full capacity and IC3e is operating partial capacity, which will increase over the next years.

TABLE 45 below summarises the plant and equipment for IC2 and IC3e that will be in place when these datacentres operate at full capacity. The location of the main items of plant is shown in **Figure 15** of this EIS. The sound level data for the equipment and operational quantities were provided by the client based upon information for the existing facility or measurements undertaken on site at the existing facility.

TABLE 45: IC2 AND IC3E NOISE LEVEL DATA

Plant / equip and no.	Location	Descr.	Overall dB(A)	Octave Band Centre Frequency - Hz dB								Notes[1]
				63	125	250	500	1k	2k	4k	8k	
IC2 data centre												
DRUPS x 5	Level 1	L_p L_{eq}	105	82	94	97	96	98	99	99	98	-

		@1m										
Chillers x 5	Roof	L_W	95	93	96	98	93	89	84	77	74	-
Chiller x 1	Roof	L_W	97	93	99	96	95	93	86	82	74	-
Transformers x 6	Ground	L_W	81	68	86	84	83	70	60	54	57	-
AHU x 1	Roof	L_W	86	64	69	69	86	80	78	74	64	-
FCU Condenser x 1	Roof	L_W	94	106	102	100	91	84	73	63	57	-
Condenser x 4	Roof	L_W	75	76	80	76	74	69	63	57	55	-
Condenser x 2	Roof	L_W	80	82	82	80	80	74	68	65	60	-
Generators within acoustic enclosure and attenuators x 4	Roof – eastern side	L_p L_{eq} @1m	73	88	86	74	64	61	57	57	66	Note 1(a)
IC3e data centre												
Cooling Towers x 6	Roof	L_W	95	99	97	98	93	89	81	77	74	-
Transformers x 7	Level 1&5	L_p L_{eq} @1m	70	56	74	72	71	58	48	42	45	-
Chillers x 6	Level 5	L_W	104	90	95	95	93	92	96	101	90	-
Pumps x 6	Level 5	L_W	92	87	85	85	84	83	83	89	74	-
Pumps x 4	Level 5	L_W	90	85	83	83	82	81	81	87	72	-
Pumps x 6	Level 5	L_W	88	83	81	81	80	79	79	85	70	-
Pumps x 2	Level 5	L_W	81	76	74	74	73	72	72	78	63	-
AHU x 2	Roof	L_W	82	97	85	83	81	75	73	68	62	-
Condenser x 5	Roof	L_W	82	82	82	80	80	74	68	65	60	-
Condenser	Ground	L_W	82	82	82	80	80	74	68	65	60	-
Supply fan x 2	Roof	L_W	90	83	85	87	90	86	79	72	65	-
Exhaust fan x 3	Roof	L_W	77	64	75	76	74	72	69	63	49	-
Exhaust fan x 2	Roof	L_W	86	71	77	81	85	81	77	70	63	-
Generators with attenuators x 8[2]	Ground – eastern side	Outlet (atmosphere side) L_p L_{eq} @1m	60	77	67	65	53	49	46	47	33	Note 1(b)

Notes:
1. All noise levels, except for generators are based on unmitigated equipment
   (a) Based on measurements conducted on site on 02/05/2019
   (b) Based on measurements conducted on site on 04/03/2021
2. Generator engine is located within the data centre building (inlet located within the semi-enclosed ground level)

Proposed IC3w:

TABLE 46 below summarises new mechanical services plant and equipment associated with IC3w. The location of the main items of plant is shown in **Figure 15** of this EIS. The sound level data for the equipment and proposed quantities were provided by the client. Further detailed information about the main noise generating equipment items is outlined in the following subsections.

TABLE 46: IC3w NOISE LEVEL DATA

Plant / equip and no.	Location	Descriptor[1]	Overall dB(A)	Octave Band Centre Frequency - Hz dB							
				63	125	250	500	1k	2k	4k	8k
Chillers x 8	Level 1	L_W	105	91	96	96	94	93	97	102	91
Chilled water pump x 8	Level 1	L_p L_{eq} @1m	77	-	-	-	-	-	-	-	-
AHU x 8	Level 1	L_W	83	95	95	87	78	72	67	60	54
CRAC x 84	Levels 2-5	L_W	82	97	91	87	77	72	68	59	48
Cooling Towers x 8	Roof	L_W	93	99	96	90	88	87	85	84	84
Carpark Exhaust fan x 1	Outlet on roof	L_W	90	90	92	86	86	86	82	78	75
Condenser water Pumps x 8	Roof	L_p L_{eq} @1m	77	-	-	-	-	-	-	-	-
Generators within acoustic enclosure x 18	Roof	Inlet with attenuator L_p L_{eq} @1m[2]	75	-	-	-	-	-	-	-	-
		Outlet with attenuator L_p L_{eq} @1m[3]	77	-	-	-	-	-	-	-	-
		Side of enclosure L_p L_{eq} @1m[4]	74	-	-	-	-	-	-	-	-

Notes:
1. All noise levels, except for generators are based on unmitigated equipment, that is no mitigation additional to that adopted by the manufacturer.
2. Inlet area = 6.8m^2
3. Outlet area = 12.8m^2
4. Side of enclosure = 37.7m^2

Staff vehicle movements and car parking

A carpark of 71 spaces will be provided on the ground level of the subject site. In accordance with The Transport Planning Partnership prepared, Transport Impact Assessment, the carpark will service the 30 staff associated with the entire site (IC2, IC3e and IC3w) and the number of staff expected to arrive by car would be 23.

Noise generated by car park activities includes vehicle doors closing, vehicle engines starting, vehicles accelerating and vehicles moving. To assess this noise, the $LA_{eq\ 15\text{-}minute}$ noise level at the nearest affected receivers was determined for each relevant period based on the number of vehicle movements expected to occur during that period. For this assessment, the proposed staff requirements for the project has been reviewed to determine the maximum number of car movements within the carpark during each assessment period. This distribution has considered the following:

- The data centres operate on a 24-hour, 7-days a week basis, so staff operate in shifts. For each shift change, staff will arrive/depart 30mins either side of this time.
- The highest number of vehicle trips per hour during day, evening and night period is 23.

- In accordance with the Traffic Impact Assessment, 77% of staff and visitors will arrive via car which will generate a parking demand of 58 spaces (or 116 vehicle trips) per 24hr period. The potential worst-case number of car movements is 72 during the daytime (7am to 10pm) and 44 during the night-time (10pm to 7am).
- Staff are expected to travel either direction on Talavera Road and so the numbers were evenly distributed in both directions.

The sound power levels generated by carpark activities on site are presented in the following table sourced from the Renzo Tonin & Associates database. The majority of the noise will remain within the carpark structure, with the main source of breakout being at the carpark entrance/exit located on the western side of the building.

TABLE 47: CARPARK ACTIVITY SOUND POWER LEVELS		
Activity	**Metric**	**Individual noise source sound power level, $L_{Aeq,t}$ dB(A) re. 1pW**
Vehicle moving (10km/h)	Passby LW	79
Door slam	LW+10log(t)	86
Engine start	LW+10log(t)	92

Loading dock

The loading dock is located on the eastern side of the site. In accordance with the Traffic Report, waste collection (the most common usage) is undertaken by an 9m Medium Ridge Vehicle. On very rare occasions (1-2 times a year) a larger truck (19m length) maybe required to accommodate pant upgrades.

Trucks would enter and exist via the Talavera Road eastern entry. Modelling of loading dock operations were based upon sound power levels presented in **TABLE 48**, which have sourced from the Renzo Tonin & Associates database of previous measured levels.

TABLE 48: LOADING DOCK AREA ACTIVITIES SOUND POWER LEVELS		
Equipment / Plant	**Noise source / noise generating operation**	**Individual source/activity sound power level (SWL, re. 1pW), $L_{Aeq,t,}$ dB(A)**
9 metre rigid	Moving onsite (20km/h)	106
	Idling	96
Prime mover	Moving onsite (20km/h)	107
	Idling	96

Operational noise prediction methodology:

Modelling and assessment of airborne noise impacts from the Project were determined by modelling the noise sources, receiver locations and topographical features, and possible noise mitigation measures using a 3D noise modelling package, CadnaA (Version 2021 MR 1). Noise modelling algorithms were used to calculate the contribution of each noise source at each identified sensitive receiver location and to predict the total noise from the site.

Internal spaces within the facility such as the semi-enclosed ground floor, were modelled using CadnaR (Version 2021) to determine the noise levels at the openings to these spaces.

The noise prediction model considers:

- Location of noise sources and sensitive receiver locations (including multi-storey buildings).
- Heights of sources and receivers referenced to digital ground contours with a 1 m contour interval, or relative to the project.
- Noise source levels of individual plant and equipment.
- Separation distances between sources and receivers.

- Ground type and reflections between sources and receivers (ground absorption value of 0 for the site, and 0.5 for remaining areas).
- Attenuation from barriers, buildings and structures (natural terrain and purpose built).
- Atmospheric losses and meteorological conditions.
- The noise mitigation/treatments, that have been determined for the project

The CONCAWE noise propagation algorithm was implemented for assessing potential noise impacts because:

- CONCAWE allows for the standard and noise-enhancing meteorological conditions presented in NPfI Fact Sheet D to be directly considered.
- The CONCAWE algorithm at the receiver distances relevant to this assessment provides for a conservative assessment.

Meteorological conditions:

In accordance with the NPfI, the noise assessment considers the effects of adverse meteorological conditions such as wind and temperature inversions. The following noise-enhancing meteorological conditions have been considered in the noise assessment scenarios.

TABLE 49: PREVAILING NOISE-ENHANCING ASSESSMENT METEOROLOGICAL CONDITIONS

Assessment period	**Assessment meteorological condition**	
	Standard meteorological conditions	**Noise-enhancing meteorological conditions**
Day (7am – 6pm)	Class D with 0.5 m/s winds[1]	Class D with 3 m/s[1]
Evening (6pm – 10pm)		
Night (10pm – 7am)		Class F with 2 m/s winds[1]

Note: 1. All directions considered

Noise predictions:

Predictions have been undertaken for the following reasonable worst case 15-minute scenarios:

- Scenario 1 (normal operations):
  - All of the IC2, IC3e and IC3w identified mechanical equipment operating at full capacity, except for the emergency backup generators.
  - Operating during daytime, evening and night-time.
  - Standard and noise-enhancing meteorological conditions applied.

- Scenario 2 (generator maintenance testing):
  - All of the IC2, IC3e and IC3w identified mechanical equipment operating at full capacity.
  - One IC3w emergency backup generator operating at full capacity (worst case generator selected i.e. nearest).
  - Operating during daytime only.
  - Standard and noise-enhancing meteorological conditions applied.

Predicted noise levels have been assessed to all the nearby representative receivers, and a summary of these results are presented in **TABLE 50**. From **TABLE 50**, it can be seen that the project is predicted to comply for both scenarios at all the identified receiver locations.

Noise contour maps at 1.5 metres above the local ground level for each of the scenarios assessed are presented in **Figure 30** and **Figure 31**.

TABLE 50: PREVAILING NOISE-ENHANCING ASSESSMENT METEOROLOGICAL CONDITIONS												
ID	**Assessment Location [7]**	**Type**	**Scenario 1 (normal operations)**					**Scenario 2 (generator maintenance testing)**				
			Std Cond[1]	**Enhancing Cond**		**Criteria[4]**	**Comply**	**Std Cond[1]**	**Enhancing Cond**		**Criteria[4]**	**Comply**
				Wind 3m/s[2]	**Inver[3]**				**Wind 3m/s[2]**	**Inver[3]**		
R1	Level 7 (top floor)	Residential	42	43	43	**43**	**Yes**	46	47	47	**50**	**Yes**
R2	Level 2 (top floor)		40	41	41	**43**	**Yes**	42	43	43	**50**	**Yes**
R3	Level 3 (top floor)		39	40	40	**43**	**Yes**	40	41	41	**50**	**Yes**
R4	Level 19 (top floor)		40	41	41	**43**	**Yes**	42	43	43	**57**	**Yes**
R5	Level 18 (top floor)		37	39	39	**43**	**Yes**	40	42	42	**57**	**Yes**
R6	Ground floor at boundary		30	31	31	**43**	**Yes**	36	37	37	**57**	**Yes**
R7	Level 1 (top floor)		34	35	35	**38**	**Yes**	37	38	38	**47**	**Yes**
R8	Ground floor of tenancy	Childcare[6]	39	40	40	**53**	**Yes**	42	43	43	**53**	**Yes**
R9	Ground floor of tenancy		33	34	34	**53**	**Yes**	36	37	37	**53**	**Yes**
R10	Ground floor of tenancy		44	44	44	**53**	**Yes**	47	47	47	**53**	**Yes**
R11	Ground floor of tenancy		40	41	41	**53**	**Yes**	42	43	43	**53**	**Yes**
R12	Level 1 of tenancy		35	36	36	**53**	**Yes**	38	40	40	**53**	**Yes**
R13	Level 1 of building	Education	52	52	52	**60**	**Yes**	54	55	55	**60**	**Yes**
R14	Ground floor of building		39	40	40	**58**	**Yes**	40	41	41	**58**	**Yes**
R15	Ground floor of building	Medical	44	44	44	**48**	**Yes**	45	46	46	**48**	**Yes**
R16	Level 7 (top floor)	Hotel/motel	46	47	47	**48**	**Yes**	48	49	49	**63**	**Yes**
R17	Level 8 (top floor)		34	35	35	**48**	**Yes**	36	37	37	**63**	**Yes**
R18	Level 7 (top floor)		34	35	35	**48**	**Yes**	39	40	40	**63**	**Yes**
R19	Level 7 (top floor)	Commercial	61	61	61	**65**	**Yes**	61	61	61	**65**	**Yes**
R20	Level 9 (top floor)		57	57	57	**65**	**Yes**	58	58	58	**65**	**Yes**
R21	Level 6 (top floor) [8]		49	49	49	**63**	**Yes**	50	50	50	**63**	**Yes**
R22	Level 3 (top floor)		52	52	52	**65**	**Yes**	55	55	55	**65**	**Yes**

	Notes:	1. Class D with 0.5 m/s winds (all wind directions considered) 2. Class D with 3 m/s (all wind directions considered) 3. Class F with 2 m/s winds (all wind directions considered) 4. For residential and hotel receivers the night-time criterion is presented to represent worst case assessment situation 5. Daytime criterion as emergency generators only tested during the daytime 6. The criteria for childcare play area rather than external classroom criteria is presented 7. Most affected apartment / hotel room / room / play area 8. To represent new building associated with SSD-10467

Annoying noise characteristics adjustments:

Where the character of the industrial noise is assessed as particularly annoying at a receiver location (ie. if the resulting noise level at a receiver location is tonal, low frequency or is intermittent at night), then an adjustment would be added to penalise the predicted noise for its potential increase in annoyance. The Fact Sheet C of the NPfI provides definitive procedures for determining whether a modifying factor should be applied which will be assessed as part of the Project. The corrections are to be added to the predicted noise levels at the receiver before comparison with the project noise trigger levels.

Measurements of the noise source levels from the key noise generating plant/equipment were undertaken at with the existing facility with a sufficient duration to capture typical total activity noise levels along with all relevant statistical measurement parameters (L_{Amax}, $L_{A1,T}$, $L_{A10,T}$, $L_{A90,T}$, L_{Amin}) in accordance with AS1055:2018.

Tonality

One noise source was identified as having the potential to be tonal at the nearby receivers, this being the tonal reversing alarms on heavy vehicles.

Reviewing the contribution from this individual noise source, and that the overall noise levels are generally controlled but the steady-state or quasi-steady-state mechanical and electrical plant/equipment and building services the resulting noise levels at nearby receivers are unlikely to have tonal characteristics.

Intermittent noise

The NPfI details that the test for intermittent noise that applies during the night period to be *"The source noise heard at the receiver varies by more than 5 dB(A) and the intermittent nature of the noise is clearly audible."* and *"...where the level suddenly drops/increases several times during the assessment period..."*. During the environmental assessment phase it is not possible to listen and subjectively assess the noise at the receiver as required by the guideline. However, only where all of the following tests are met shall a penalty be applicable to the predicted noise level at the relevant receiver:

- the noise level fluctuates / cycles by more than 5 dB(A);
- this difference relates to a 'sudden' drop/increase in the activity noise level;
- this activity may occur multiple times during a 15-minute assessment period; and
- the predicted noise level from the subject source at a receiver is clearly audible over the ambient noise environment.

The only noise source which potentially exhibits intermittent characteristic, such as cycling on and off, would be the reversing alarms fitted to the heavy vehicles that access the loading bay. However, the loading bay would not be utilised at night-time.

As such, the noise emissions during the night-time period are unlikely to require an intermittent penalty as identified in the NPfI.

Impulsiveness noise

The *Draft Industrial Noise Guidelines Technical Background Paper* (EPA, 2015), proposed to seek the views of acoustical practitioners as part of the review/consultation process, and impulsiveness had not been included in the NSW EPA draft Industrial Noise Guideline (draft ING). Subsequently, impulsiveness was not included in the NPfI released by the EPA in 2017.

AS1055-2018 describes how potentially annoying characteristics, such as impulsiveness, should be assessed. Section 6.7.4 Impulse adjustment (K2) of AS1055-2018 states:

> *"If impulsiveness is a significant characteristic of the sound within a measurement time interval, an adjustment shall be made over this time interval.'*

Also, Appendix E of AS1055-2018 provides an objective method for application of an impulse adjustment to measured receiver noise at receivers where deemed necessary. Impulsive noise is defined in this standard as a sound with a sudden onset. The definition includes only the onset of a sound, not the sound as a whole. Onset is defined in the standard as a sound having a positive slope time history where the gradient exceeds 10 dB/s.

Section E9 'Care in the use of methods' of AS1055-2018 also states that:

> *"It is recommended that the impulse method only be applied where the occurrence of impulsive sounds caused by a subject source are identified audibly to occur at the receiver locations by attended monitoring."*

Given that the noise sources associated with the proposal are steady-state or quasi-steady-state, no impulsive noises with a sudden onset of significant level at the receiver areas are anticipated from the proposed development. Therefore, the procedure for objective determination of an impulse adjustment to measured noise at receiver locations provided in Appendix E of the Australian Standard, does not apply here and no adjustment for impulsiveness is necessary.

Sleep disturbance assessment

The night-time noise sources associated with the project are steady-state or quasi-steady-state, and therefore there is unlikely to be significant variation between $L_{Aeq,15min}$ values and L_{AFmax} values, hence compliance with the more stringent project trigger noise level will result in compliance with the project's sleep disturbance criteria.

Traffic assessment

The site is expected to generate a worst-case 68 movements during the daytime (7am to 10pm) and 34 movements during the night-time (10pm to 7am). This amount of traffic is not expected to significantly alter existing traffic noise and any increases are expected to be insignificant, well below the 2 dB increase threshold within the RNP and have minor impact. Furthermore, there are no residential receivers located along Talavera Road and any other sensitive land uses (i.e. childcare centres) are set back from Talavera road will a significant amount of intervening shielding from neighbouring buildings.

6.1.5.9 Operational mitigation and management measures

As per the above assessment, as the majority of noise generator items are mechanical and electrical plant/equipment and building services, final selection of specific plant/equipment and associated acoustic mitigation measures would be undertaken during the detailed design phase. During the detailed design phase of the development, it is important that an acoustic assessment of mechanical services equipment be undertaken to ensure that the cumulative noise emissions of all equipment is consistent with this report, and does not exceed the applicable noise criteria in the Noise and Vibration Assessment.

Following the commencement of operation, and at a point in time that normal full capacity operations are being undertaken, noise measurements should be undertaken to confirm the noise emissions from the facility are consistent with this assessment. The method for measuring the performance of the facility should be undertaken in accordance with Section 7 'Monitoring performance' of the NPfI.

As part of the site's Operational Noise Management Plan, not only should reviewing the site noise emissions against the predicted noise levels in this assessment be incorporated, there should also be regular reviews of on-site noise mitigation and management practices to incorporate and capture opportunities for reductions of site noise emissions with considerations of at minimum the following:

- Review of noise reduction opportunities during changes or refinements of site noise generating activities.
- Reviewing noise levels of plant, equipment and activities, during both ongoing compliance checks and in response to complaints.
- Improvements in Best Management Practice (BMP), as defined in the NPfI.
- Improvements in Best Available Technology Economically Achievable (BATEA), as defined in the NPfI.

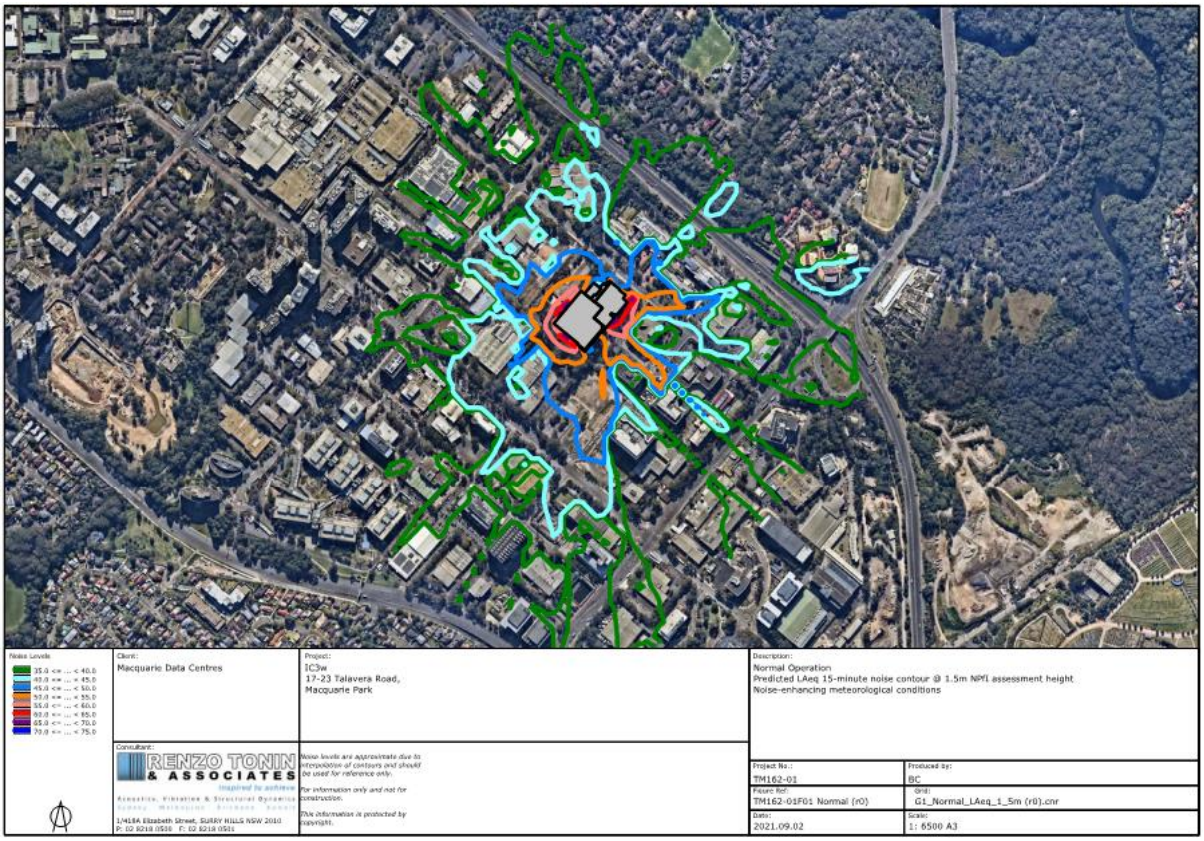


Figure 30 Normal Operation – Predicted LAeq 15-minute noise contour @ 1.5m NPfI assessment height Noise-enhancing meteorological conditions (Source: Renzo Tonin, 2021)

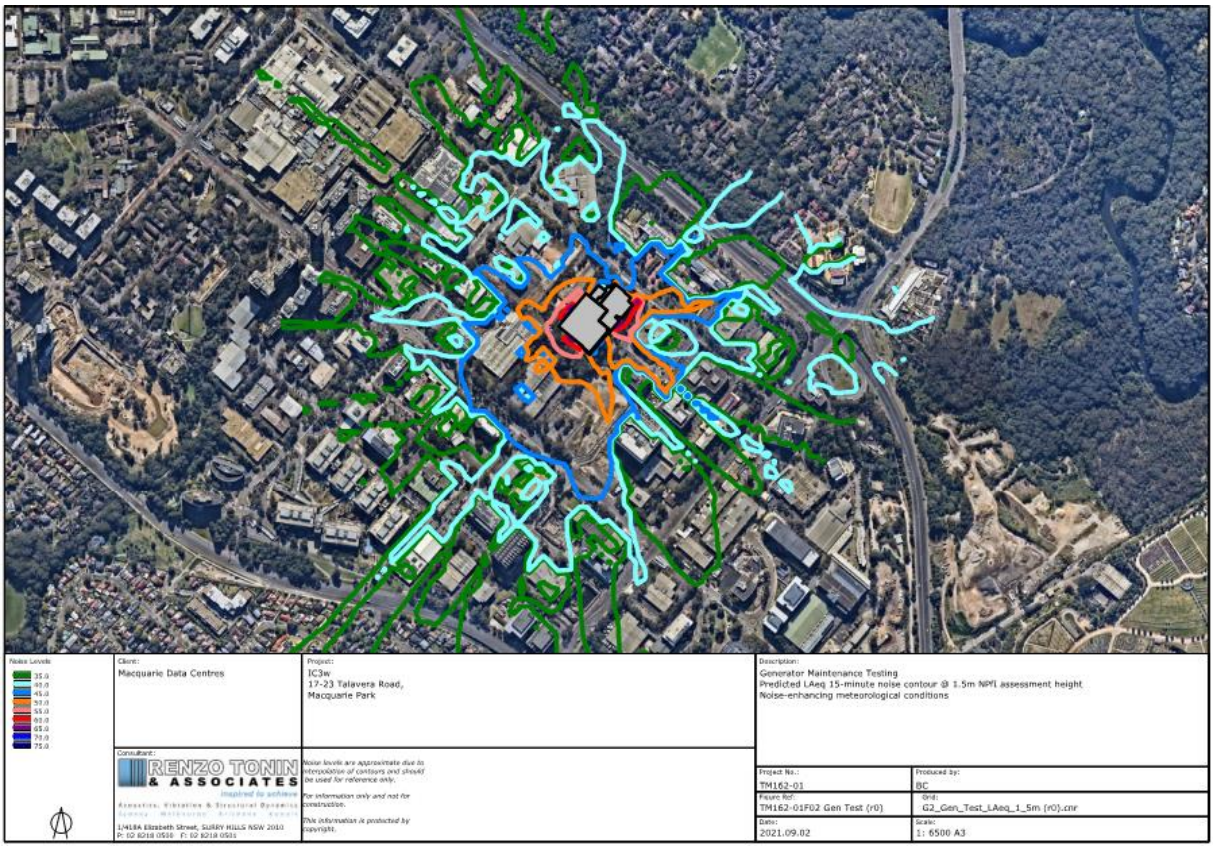


Figure 31 Generator Maintenance Testing – Predicted LAeq 15-minute noise contour @ 1.5m NPfI assessment height Noise-enhancing meteorological conditions (Source: Renzo Tonin, 2021)

6.1.6 Air quality and odour

This section of the EIS evaluates the air quality aspects of the proposed development, in relation to the SEARs and addresses the following specific matters:

- ***a quantitative assessment of the potential air quality, dust and odour impacts of the development, during construction and operation, in accordance with relevant Environment Protection Authority guidelines***
- ***The assessment must include:***
  - ***scenarios for construction works, operations, and testing of the back-up power system or its considered alternatives and a justified worst-case scenario***
  - ***assessment of emissions from the back-up power system against the standards of concentration outlined in the Protection of the Environment Operations (Clean Air) Regulation 2010 (including, but not limited to, polycyclic aromatic hydrocarbons (PAHs) and oxides of nitrogen (NOx) impacts)***
  - ***assessment of criteria pollutants in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA, 2016)***
- ***details of proposed mitigation, management and monitoring measures (including for the back-up power system) required to ensure compliance with section 128 of the Protection of the Environment Operations Act 1997.***

In response to the SEARs items relating to air quality, we note the following information presented by SLR Consulting in their AQIA, which forms part of **Appendix 15** of this EIS.

6.1.6.1 Air emission sources

Construction phase emission sources:

During the construction works, fugitive dust emissions are considered to be the primary emission type, which could give rise to nuisance and/or health impacts for the surrounding sensitive areas.

The main emissions to air during the construction phase are likely to be emissions of suspended particulate matter and nuisance dust from the movement of vehicles and construction equipment, excavation and rehabilitation, demolition, clearing and grading, truck loading and unloading and wind erosion.

Operational phase emission sources:

Generators are required to ensure ongoing operation if the mains grid electricity supply is interrupted for more than a few minutes. The function of the standby generators is to provide power when there is an unexpected interruption of mains grid electricity.

During the operational phase, the generators would be a source of products of combustion while undergoing testing and in the event of a power failure. In general, power interruptions last anything from a few seconds to a few hours and therefore even when required the generators would only operate for a short time.

In order to assess the worst-case scenario, the modelling undertaken for the operational scenario conservatively assumes that:

- Each generator would be tested for a period of 60 minutes.
- Five generators will be tested concurrently within the same hour.
- Testing of generators is conducted every hour of the year between 9:00 am and 5:00 pm, i.e. one additional hour to assess the operation of the generators under varying meteorological conditions and conservatively allow for potentially elevated evening background concentrations of NO_2.

Major power interruptions requiring the simultaneous operation of all standby generators would only occur very infrequently and for a limited time period.

In order to assess the worst-case emergency conditions, the modelling undertaken for the operational scenario conservatively assumes that all 34 generators run concurrently within the same hour.

The emergency conditions are modelled for every hour of the year. This is an unrealistic situation only assumed such that the emergency operation of the generators under varying meteorological conditions can be conservatively assessed.

6.1.6.2 Pollutants of concern

Construction pollutants of concern:

Potential air pollutants of interest for the construction of the project are considered to be:

- Suspended particulate matter.
- Deposited dust.

Airborne contaminants that can be inhaled directly into the lungs can be classified based on their physical properties as gases, vapours or particulate matter. In common usage, the terms “dust” and “particulates” are often used interchangeably. The health effects of particulate matter are strongly influenced by the size of the airborne particles. Smaller particles can penetrate further into the respiratory tract, with the smallest particles having a greater impact on human health as they penetrate to the gas exchange areas of the lungs. Larger particles primarily cause nuisance

associated with coarse particles settling on surfaces and possessions (dust deposition), affecting visibility and contaminating tank water supplies. High rates of dust deposition can also adversely affect vegetation by blanketing leaf surfaces.

The term "particulate matter" refers to a category of airborne particles, typically less than 30 microns (µm) in diameter and ranging down to 0.1 µm and is termed total suspended particulate (TSP). Epidemiological studies suggest a relationship between health impacts and exposure to concentrations of finer particulate matter, for example particulate matter with an aerodynamic diameter of 10 microns or less, which is referred to as PM_{10}. The PM_{10} size fraction is sufficiently small to penetrate the large airways of the lungs, while $PM_{2.5}$ (2.5 microns or less) particulates are generally small enough to be drawn in and deposited into the deepest portions of the lungs. Potential adverse health impacts associated with exposure to PM_{10} and $PM_{2.5}$ include increased mortality from cardiovascular and respiratory diseases, chronic obstructive pulmonary disease and heart disease, and reduced lung capacity in asthmatic children. In an urban setting, the emission of $PM_{2.5}$ is primarily associated with vehicles exhausts resulting from the incomplete combustion of diesel. It is anticipated that the primary particle fraction associated with construction will be PM_{10}.

The key potential health and amenity issues associated with construction of proposal are, respectively:

- Elevated PM_{10} concentrations
- Nuisance due to dust deposition and visible dust plumes.

Operation pollutants of concern:

Potential air pollutants of interest for the operation of the project are considered to be emissions associated with the combustion of fuel in standby generators which include:

- carbon monoxide (CO)
- oxides of nitrogen (NO_x)
- PM_{10} and $PM_{2.5}$
- sulfur dioxide (SO_2)
- volatile organic compounds (VOCs)
- polycyclic aromatic hydrocarbons (PAHs).

The rate and composition of air pollutant emissions from generators is a function of a number of factors, including the type and size of the generators, level of operation and fuel type.

6.1.6.3 Surrounding sensitive receptors

The nearest receptors consist of childcare centres located in Business Park areas, approximately 120 m and 170 m to the northeast and northwest of the site respectively. Additionally, residential receptors have also been identified in areas zoned as High Density Residential approximately 310 m to the northeast of the Site, including 8-storey apartments approximately 400 m east of the site. Locations of all identified receptors are provided in **Figure 32** below.

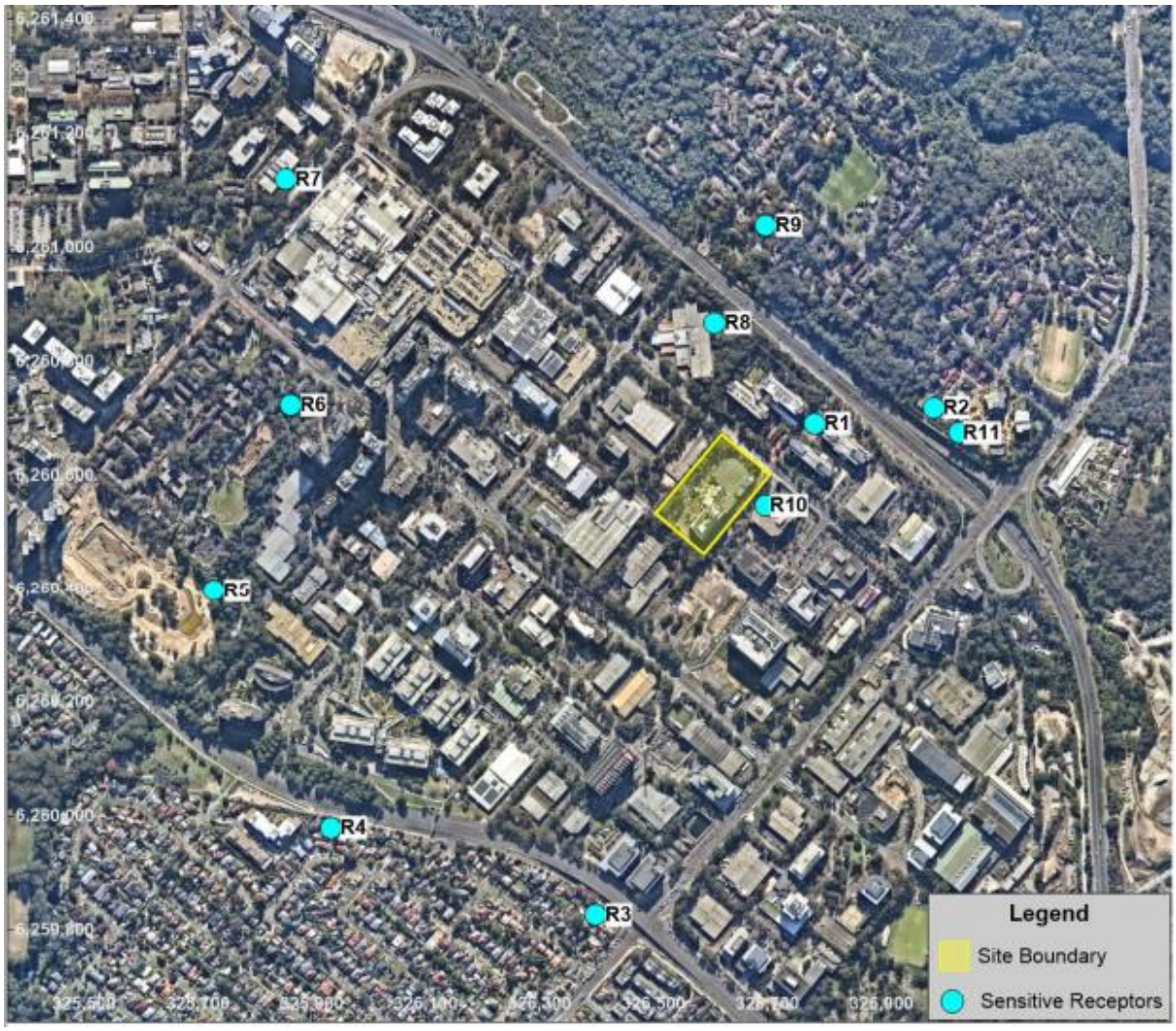


Figure 32 Representative sensitive receptor locations (Source: SLR Consulting, 2021)

6.1.6.4 Background air quality

Air quality monitoring is performed by the NSW EES at a number of monitoring stations across NSW. The closest such station is the Macquarie Park AQMS, located approximately 1.8 km northwest of the site. The Macquarie Park AQMS was commissioned in 2017 and is located at Macquarie University Sport Fields, Culloden Road in close proximity to vehicle activity along the M2 Motorway. It is situated at an elevation of 49 m. SLR considers air quality data from this station to be a reasonable representation of air quality conditions experienced at the Site (due to surrounding land use). The air pollutants currently measured by the Macquarie Park AQMS include:

- NO, NO_2 & NO_x
- PM_{10}
- $PM_{2.5}$
- O_3

Air quality monitoring data recorded by the Macquarie Park AQMS were obtained for the modelling year of 2018. To be consistent with the NSW EES monitoring reports, the data for gaseous pollutants are presented in parts per hundred million (pphm) or parts per million (ppm), rather than $\mu g/m^3$ and mg/m^3.

A review of the data shows that exceedances of the 24-hour average PM_{10} criterion and 24-hour average $PM_{2.5}$ criterion were recorded by the Macquarie Park AQMS in 2018.

A review of the recorded exceedances during the calendar year of 2018 (NSW OEH, 2019) indicates that they were due to natural events such as bushfires or dust storms, or hazard reduction burns.

No exceedances of the annual average PM_{10} criterion and annual average $PM_{2.5}$ criterion were recorded by the Macquarie Park AQMS in 2018.

Ambient concentrations of SO_2, NO_2 and CO were below all relevant criteria for 2018.

6.1.6.5 Construction phase air quality impact assessment

Potential impacts of dust emissions associated with proposed demolition and construction activities at the Site has been performed based on the methodology outlined in the Institute of Air Quality Management (UK) (IAQM) document, "Assessment of dust from demolition and construction" (Holman et al 2014). This guidance document provides a structured approach for classifying construction sites according to the risk of air quality impacts, to identify relevant mitigation measures appropriate to the risk.

Step 1 – Screening based on separation distance:

The nearest sensitive receptor is located approximately 120 m from the nearest site boundary.

The screening criteria for detailed assessment are:

- a 'human receptor' within:
  - 350 m of the boundary of the site; or
  - 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).
- an 'ecological receptor' within:
  - 50 m of the boundary of the site; or
  - 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

Since the nearest sensitive receptor has been identified to be 120 m northeast of the site boundary, a detailed assessment is deemed necessary for construction impacts.

In relation to the wind roses, it is apparent that winds that would blow fugitive dust emissions from the construction works towards the identified receptor are most likely to occur during the summer, autumn and spring months and least likely to occur during the winter months.

Step 2a – Assessment of scale and nature of the works:

Based on the IAQM definitions, dust emission magnitudes for the anticipated works have been categorised as presented in **TABLE 51**. It is noted that no demolition works are anticipated to occur on site and hence impacts from these activities have not been considered further.

TABLE 51: CATEGORISATION OF DUST EMISSION MAGNITUDE

Activity	Dust Emission Magnitude	Basis
Earthworks (E)	Medium	Total site area 2,500 m^2 to 10,000 m^2, moderately dusty soil type (e.g. silt), 5 to 10 heavy earth moving vehicles active at any one time, formation of bunds 4 m to 8 m in height, total material moved 20,000 t to 100,000 t. Total area where the earthworks will be undertaken for the project, including removal of carparks and internal roads is estimated to be greater than 3,000 m^2.
Construction (C)	Medium	Total building volume 25,000 m^3 to 100,000 m^3, potentially dusty construction material (e.g. concrete), piling, on site concrete batching. The total building area is estimated to be greater than 3,000 m^2. Therefore, the total volume is likely to be greater than 25,000 m^3.
Trackout	Medium	Between 10 and 50 heavy vehicle movements per day,

TABLE 51: CATEGORISATION OF DUST EMISSION MAGNITUDE		
Activity	**Dust Emission Magnitude**	**Basis**
(T)		surface materials with a moderate potential for dust generation, between 50 m and 100 m of unpaved road length. The unpaved road length is estimated to be less than 50 m.

Step 2b – Risk assessment:

- Receptor Sensitivity
  - The sensitivity of the identified receptor in this study is conservatively classified high for dust soiling and high for health impacts.
- Sensitivity of an Area
  - The sensitivity of the area to dust soiling may be classified as medium while the sensitivity of the area for health effects may able be classified as low, based on an annual average PM_{10} concertation of 17.2 µg/m^3.
- Risk Assessment
  - **TABLE 52** presents the preliminary risk of air quality impacts from uncontrolled construction activities determined using the risk matrix provided, based on the identified receptor sensitivity and sensitivity of the area.

TABLE 52: PRELIMINARY RISK OF AIR QUALITY IMPACTS FROM CONSTRUCTION ACTIVITIES (UNCONTROLLED)							
Impact	**Sensitivity of Area**	**Dust Emission Magnitude**			**Preliminary Risk**		
		E	**C**	**T**	**E**	**C**	**T**
Dust Soiling	Medium	Medium	Medium	Medium	Medium	Medium	Low
Health Effects	Low	Medium	Medium	Medium	Low	Low	Low

The results indicate that there is a low risk of adverse dust soiling and health effects occurring at the off-site sensitive receptor locations if no mitigation measures were to be applied to control emissions during the works.

Step 3 – Mitigation measures:

For almost all construction activity, the IAQM Methods notes that the aim should be to prevent significant effects on receptors through the use of effective mitigation and experience shows that this is normally possible.

The IAQM document provides guidance on appropriate mitigation measures for construction activities
determined to have low, medium and high preliminary risk of adverse air quality impacts. **TABLE 53** lists the relevant mitigation measures by the IAQM methodology for a project shown to have a low risk of adverse impacts. Not all these measures would be practical or relevant for the project, hence a detailed review of the recommendations should be performed as part of the development of the Construction Environmental Management Plan (CEMP) and the most appropriate measures adopted.

TABLE 53: PROACTIVE DUST MITIGATION MEASURES	
No. #	**Mitigation Measure**
1	**Communications**
1.1	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
1.2	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the Site Manager.

TABLE 53: PROACTIVE DUST MITIGATION MEASURES	
No. #	**Mitigation Measure**
1.3	Display the head or regional office contact information.
2	**Site Management**
2.1	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
2.2	Make the complaints log available to the Local Authority when requested.
2.3	Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
3	**Preparing and Maintaining the Site**
3.1	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
3.2	Erect solid screens or barriers around dusty activities or the site boundary that they are at least as high as any stockpiles on site.
3.3	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
3.4	Avoid site runoff of water or mud.
3.5	Keep site fencing, barriers and scaffolding clean using wet methods.
3.6	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
3.7	Cover, seed or fence stockpiles to prevent wind erosion.
4	**Operating Vehicle/Machinery and Sustainable Travel**
4.1	Ensure all on-road vehicles comply with relevant vehicle emission standards, where applicable.
4.2	Stationary trucks will switch off engines if idling time on-site is likely to exceed 2 minutes.
4.3	Avoid using the local road network during peak traffic periods, where possible.
4.4	Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
4.5	Minimise truck queuing and unnecessary trips through logistical planning.
5	**Operations**
5.1	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
5.2	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation, using non-potable water where possible and appropriate.
5.3	Use enclosed chutes and conveyors and covered skips.
5.4	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
6	**Waste Management**
6.1	No on-site burning of waste materials.
7	**Excavation**
7.1	Only the minimum area necessary is disturbed at any one time.
7.2	Where applicable, rehabilitation of disturbed areas will be undertaken as soon as practicable.
7.3	If unanticipated strong odours are encountered or significant dust emissions are noted on site, stop related work and seek advice from the Environmental Coordinator or equivalent role.

TABLE 53: PROACTIVE DUST MITIGATION MEASURES	
No. #	**Mitigation Measure**
7.4	Carry out excavation works and vehicle loading/unloading when weather conditions are favourable (i.e. receptors are upwind from the works).
8	**Construction**
8.1	Avoid scabbling (roughening of concrete surfaces) if possible.
8.2	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
9	**Trackout**
9.1	Use water-assisted dust sweeper(s) on the access and local roads to remove, as necessary, any material tracked out of the site.
9.2	Avoid dry sweeping of large areas.
9.3	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
9.4	Record all inspections of haul routes and any subsequent action in a site log book.
9.5	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site).
10	**Contingency Plan for Prolonged Dust Events**
10.1	Deployment of additional water sprays where practicable
10.2	Relocation or modification of dust-generating sources, where possible
10.3	Temporary halting of activities and resuming when conditions have improved

In addition to the mitigation measures proposed in **TABLE 53**, daily site inspections should be carried out during construction works. Daily environmental inspections will include, but not be limited to:

- Visual inspection of any airborne dust being generated on-site or being observed blowing off-site
- Ensuring roads leaving the Site are free of soil, and that there is no observable soil tracking onto the road network
- Inspection of the erosion and sediment control systems for silt build-up
- Inspection of stockpiles and waste storage areas to ensure no significant wind erosion is observable.

Any environmental inspection reports should include the above observations, with remedial or corrective actions noted (as appropriate). Any remedial or corrective actions must be reported to the Site Manager as soon as is practicable.

Step 4 – Residual impacts:

A reappraisal of the predicted unmitigated air quality impacts on sensitive receptors has been performed to demonstrate the opportunity for minimising risks associated with the use of mitigation strategies. These are termed 'residual impacts'. The results of the reappraisal are presented below in **TABLE 54**.

TABLE 54: RESIDUAL RISK OF AIR QUALITY IMPACTS FROM CONSTRUCTION ACTIVITIES				
Impact	**Sensitivity of Area**	**Residual Risk**		
		E	**C**	**T**
Dust Soiling	Low	Low	Low	Negligible
Health Effects	Medium	Negligible	Negligible	Negligible

The dust deposition impacts for mitigated activities are anticipated to be low for earthworks and construction activities and negligible for trackout activities, while health impacts for all mitigated activities are anticipated to be negligible.

6.1.6.6 Operational phase air quality impact assessment

The assessment of air emissions from the operational phase of the Project has been performed quantitatively through the use of dispersion modelling techniques. Reference should be made to Section 8.2 of the AQIA, contained in Error! Reference source not found. of this EIS, for further detail o n the selection of dispersion modelling.

Particulates:

TABLE 55 presents maximum 24-hour and annual average incremental particulate matter concentrations at surrounding sensitive receptor locations. Given the insignificant incremental increase of particulate matter predicted at the identified receptors, additional exceedances of PM_{10} and $PM_{2.5}$ criteria due to the operation of the project are considered unlikely.

TABLE 55: MAXIMUM PREDICTED PM CONCENTRATIONS AT SENSITIVE RECEPTORS

ID	Increment (µg/m³)	
	Maximum 24-Hour	Annual
R1	0.37	0.038
R2	0.18	0.019
R3	0.073	0.0059
R4	0.068	0.0104
R5	0.069	0.0079
R6	0.082	0.0064
R7	0.075	0.0051
R8	0.26	0.035
R9	0.16	0.017
R10	0.54	0.076
R11-0	0.16	0.016
R11-1	0.16	0.016
R11-2	0.16	0.016
R11-3	0.16	0.016
R11-4	0.15	0.016
R11-5	0.15	0.016
R11-6	0.15	0.016
R11-7	0.15	0.016

NO_2:

TABLE 56 presents the incremental and cumulative maximum 1-hour and annual average NO_2 concentrations predicted at identified sensitive receptor locations. Contour plots of the predicted incremental NO_x concentrations are presented in **Figure 33**and **Figure 34**.

The modelling results show that the predicted cumulative maximum 1-hour and annual average NO_2 concentrations are below the relevant ambient air quality criteria at all receptor locations modelled.

TABLE 56: MAXIMUM PREDICTED PM CONCENTRATIONS AT SENSITIVE RECEPTORS

ID	Increment (µg/m³)							Cumulative (µg/m³)	
	Maximum 1-Hour	Corresponding 1-Hour[a]					Annual	1-Hour	Annual
		NO_X (µg/m³)	O_3 (ppb)	Wind speed (m/s)	Transport Time (s) [b]	NO_2 (µg/m³)			
R1	7.6	517	35	5.3	38	1.9	0.18	56	11
R2	7.4	237	42	3.6	111	9.4	0.18	57	11
R3	16	112	60	5.9	136	9.4	0.13	56	11
R4	14	87	69	6.1	148	7.5	0.28	56	11
R5	9.1	85	60	6.2	145	7.5	0.21	56	11
R6	8.2	95	78	2.3	326	11	0.14	56	11
R7	9.0	134	34	5.9	161	7.5	0.13	56	11
R8	7.2	331	31	4.1	73	3.8	0.26	62	11
R9	8.4	329	24	4.8	104	13	0.20	61	11
R10	4.0	716	42	6.6	7.6	1.9	0.10	56	11
R11-0	7.4	133	60	6.6	68	7.5	0.18	57	11
R11-1	7.4	133	60	6.6	68	7.5	0.18	57	11
R11-2	7.4	133	60	6.6	68	7.5	0.18	57	11
R11-3	7.4	133	60	6.6	68	7.5	0.18	57	11
R11-4	7.4	133	60	6.6	68	7.5	0.18	57	11
R11-5	7.4	133	60	6.6	68	7.5	0.17	57	11
R11-6	7.4	133	60	6.6	68	7.5	0.17	57	11
R11-7	7.4	133	60	6.6	68	7.5	0.17	57	11
Criteria								**246**	**62**

Note:
a Used to calculate 1-hour incremental NO2 concentration using the Method 3 (Section 8.3.2 of AQIA).
b Approximate plume transport time from source to receptor based on windspeed and separation distance.

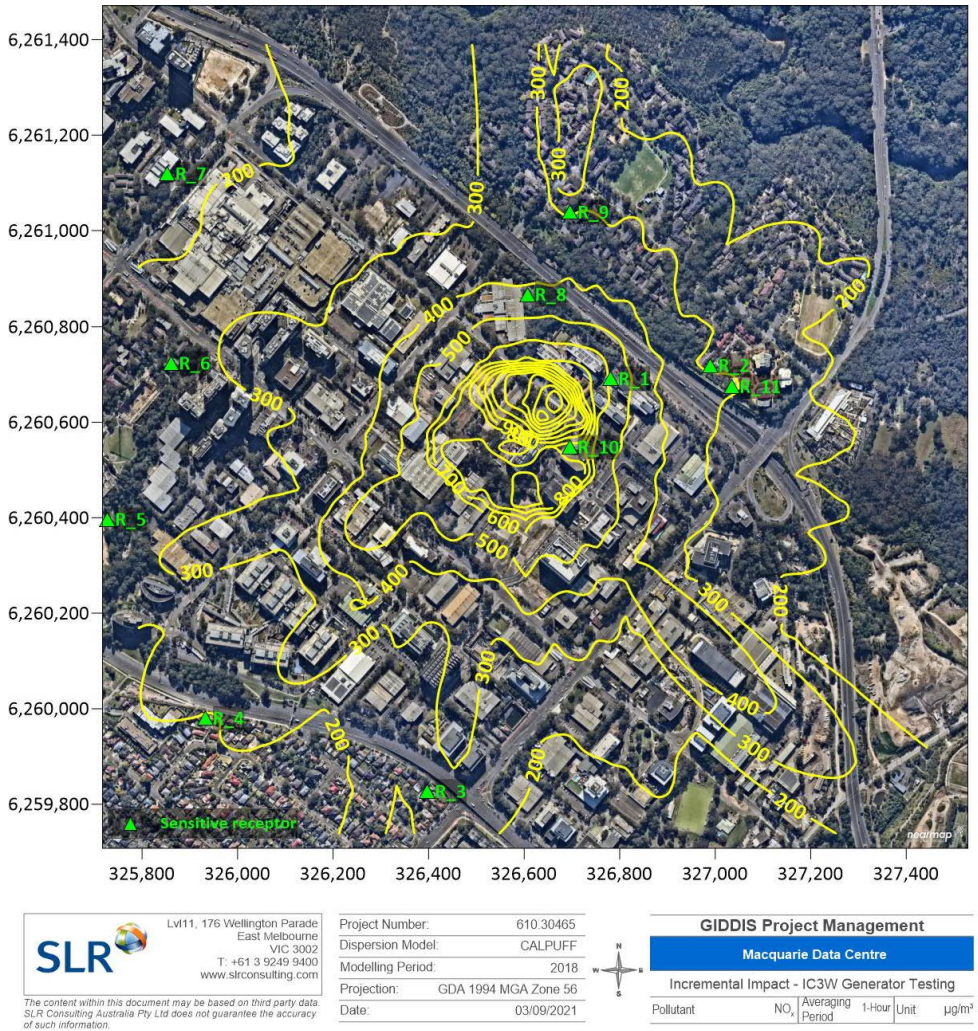


Figure 33 **Predicted 1-hour Average Incremental NO_X Isopleths – Operations (Source: SLR Consulting, 2021)**

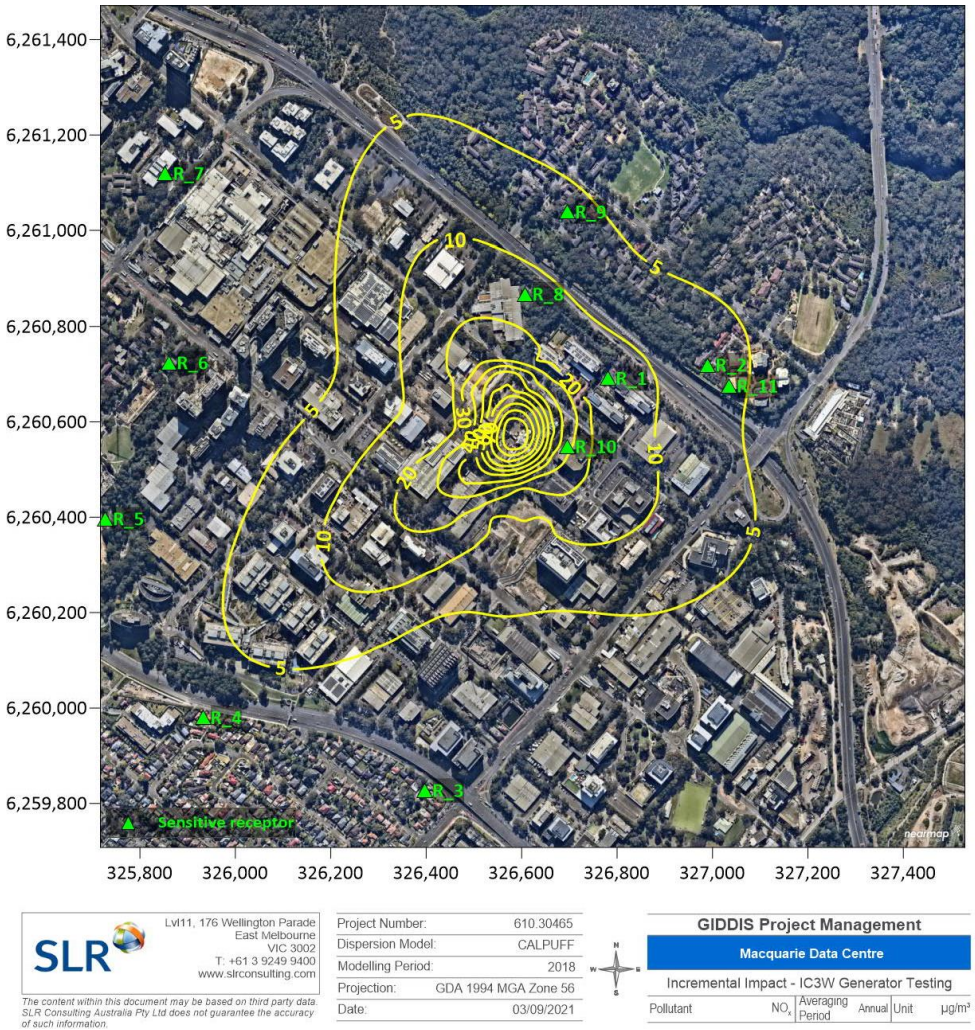


Figure 34 **Predicted Annual Average Incremental NO_X Isopleths – Operations (Source: SLR Consulting, 2021)**

CO:

TABLE 57 presents the maximum incremental 15-minute, 1-hour and 8-hour average CO concentrations predicted at surrounding sensitive receptor locations. Given the insignificant incremental increase of CO predicted at the identified receptors, exceedances of the relevant CO criteria due to the operation of the project are considered unlikely.

TABLE 57: MAXIMUM PREDICTED CO CONCENTRATIONS AT SENSITIVE RECEPTORS

ID	Increment (mg/m³)		
	15-Minute*	1-Hour	Annual
R1	0.039	0.030	0.026
R2	0.020	0.015	0.012
R3	0.019	0.015	0.005
R4	0.019	0.014	0.005
R5	0.010	0.008	0.005
R6	0.014	0.011	0.006
R7	0.010	0.007	0.005
R8	0.028	0.022	0.018
R9	0.024	0.018	0.011
R10	0.052	0.040	0.037
R11-0	0.020	0.015	0.011
R11-1	0.020	0.015	0.011
R11-2	0.020	0.015	0.011
R11-3	0.020	0.015	0.011
R11-4	0.020	0.015	0.011
R11-5	0.020	0.015	0.010
R11-6	0.020	0.015	0.010
R11-7	0.020	0.015	0.010
Criteria	**100**	**30**	**10**

Note: * The 1-hour average CO concentrations predicted by the modelling were converted to 15-minute averages using the power law formula.

SO_2:

TABLE 58 presents the incremental maximum 10-minute, 1-hour, 24-hour and annual average SO_2 concentrations predicted at surrounding sensitive receptor locations Given the insignificant incremental increase of SO_2 predicted at the identified receptors, exceedances of the relevant SO_2 criteria due to the operation of the Project are considered unlikely.

TABLE 58: MAXIMUM PREDICTED SO_2 CONCENTRATIONS AT RESIDENTIAL RECEPTORS

ID	Increment (µg/m³)			
	10-Minute*	1-Hour	24-Hour	Annual
R1	0.43	0.30	0.087	0.0089
R2	0.23	0.16	0.042	0.0043
R3	0.22	0.15	0.017	0.0014
R4	0.21	0.15	0.016	0.0024
R5	0.11	0.08	0.016	0.0018
R6	0.15	0.11	0.019	0.0015
R7	0.11	0.07	0.018	0.0012

TABLE 58: MAXIMUM PREDICTED SO_2 CONCENTRATIONS AT RESIDENTIAL RECEPTORS				
ID	**Increment (µg/m³)**			
	10-Minute*	**1-Hour**	**24-Hour**	**Annual**
R8	0.31	0.22	0.061	0.0082
R9	0.26	0.18	0.038	0.0040
R10	0.58	0.40	0.13	0.018
R11-0	0.22	0.16	0.036	0.0038
R11-1	0.22	0.16	0.036	0.0038
R11-2	0.22	0.16	0.036	0.0038
R11-3	0.22	0.16	0.036	0.0038
R11-4	0.22	0.16	0.036	0.0038
R11-5	0.22	0.16	0.036	0.0038
R11-6	0.22	0.16	0.036	0.0038
R11-7	0.22	0.16	0.035	0.0037
Criteria	**712**	**570**	**228**	**60**
Note: * The 1-hour average SO_2 concentrations predicted by the modelling were converted to 10-minute averages using the power law formula.				

PAHs:

The maximum (99.9th percentile) incremental 1-hour average PAH concentrations predicted beyond the site boundary was <0.0000004 mg/m3 significantly less (<0.1%) than the criterion of 0.0004 mg/m³. For the purposes of modelling, background PAH concentrations were assumed to be negligible. Regardless, it is unlikely that the addition of the incremental impacts to a background concentration would cause an exceedance.

TABLE 59 presents the incremental maximum 1-hour average PAH concentrations predicted at surrounding sensitive receptor locations.

TABLE 59: MAXIMUM PREDICTED PAH CONCENTRATIONS AT RESIDENTIAL RECEPTORS	
ID	**Increment 1-Hour (mg/m³)^**
R1	0.00000013
R2	<0.0000001
R3	<0.0000001
R4	<0.0000001
R5	<0.0000001
R6	<0.0000001
R7	<0.0000001
R8	<0.0000001
R9	<0.0000001
R10	0.00000017
R11-0	<0.0000001
R11-1	<0.0000001
R11-2	<0.0000001
R11-3	<0.0000001
R11-4	<0.0000001
R11-5	<0.0000001
R11-6	<0.0000001

TABLE 59: MAXIMUM PREDICTED PAH CONCENTRATIONS AT RESIDENTIAL RECEPTORS	
ID	**Increment 1-Hour (mg/m³)^**
R11-7	<0.0000001
Criteria	0.0004
Note:	^ 99.9th percentile

The dispersion modelling study, which accounted for worst-case testing conditions predicted no exceedances of the relevant ambient air quality criteria as a result of the operation of the project. It is noted that given the insignificant incremental increase in ground level concentrations of particulate matter, CO and SO_2 at the modelled sensitive receptor locations, a contemporaneous cumulative assessment was not undertaken.

6.1.6.7 Emergency conditions air quality impact assessment

Particulates:

The left-hand columns of **TABLE 60** present the incremental and cumulative maximum 24-hour average PM_{10} and $PM_{2.5}$ concentrations predicted at identified sensitive receptor locations. The exceedances of the 24-hour PM_{10} and $PM_{2.5}$ criteria are primarily due to elevated background concentrations, however, the incremental impacts of the project result in several additional exceedances of the 24-hour PM_{10} or $PM_{2.5}$ criterion at all receptors except R5, R6 and R7. These results assume that all generators are running for 24 hours every day of the year and are therefore considered very conservative. It is considered more realistic, while retaining a high degree of conservatism, to calculate the daily cumulative concentrations based on one 1-hour emergency event occurring every day of the year. The daily predicted 1-hour maximum incremental concentration, divided by 24 (24 hours), and added to the 24-hour average background concentration gives the equivalent cumulative 24-hour average concentration as provided in the right-hand columns of **TABLE 60.**

Isopleth plots of the predicted maximum 24-hour average incremental PM concentrations based on maximum 1-hour daily emergency operations are presented in **Figure 35**.

TABLE 60: MAXIMUM PREDICTED 24-HOUR PM CONCENTRATIONS AT RESIDENTIAL RECEPTORS IN EMERGENCY CONDITIONS										
ID	**Daily 24-Hour Emergency Operation**					**Daily 1-Hour Emergency Operation**				
	Maximum 24- Hour Average Incremental Concentration (µg/m³)	**Maximum Cumulative 24- Hour Average Concentration (µg/m³)**		**Additional Exceedances as Result of Project [a]**		**Maximum 1-Hour Incremental Concentration (µg/m³)**	**Maximum Cumulative 24- Hour Average Concentration (µg/m³) [b]**		**Additional Exceedances as Result of Project [a]**	
		PM_{10}	**$PM_{2.5}$**	**PM_{10}**	**$PM_{2.5}$**		**PM_{10}**	**$PM_{2.5}$**	**PM_{10}**	**$PM_{2.5}$**
R1	47	86	66	**18**	**74**	84	86	60	0	0
R2	36	87	67	**3**	**40**	104	86	60	0	0
R3	23	86	62	0	**2**	67	86	60	0	0
R4	20	86	62	0	0	63	86	61	0	0
R5	10	86	59	0	0	48	86	59	0	0
R6	13	86	59	0	0	55	86	59	0	0
R7	12	86	58	0	0	46	86	58	0	0
R8	44	86	59	**9**	**45**	90	86	59	0	0
R9	18	86	60	0	**2**	59	86	59	0	0
R10	71	137	78	**54**	**136**	168	90	60	**2**	**1**
R11-0	34	88	68	**2**	**27**	77	87	60	0	0
R11-1	34	88	68	**2**	**27**	77	87	60	0	0

R11-2	34	88	68	**2**	**27**	77	87	60	0	0
R11-3	35	88	68	**2**	**27**	78	87	60	0	0
R11-4	35	88	68	**2**	**28**	79	87	60	0	0
R11-5	35	88	68	**3**	**28**	80	87	60	0	0
R11-6	35	88	68	**4**	**28**	82	87	60	0	0
R11-7	36	87	68	**4**	**28**	83	87	60	0	0
Criteria		**50**	**25**			**Criteria**	**50**	**25**		

Note: a Over and above background, for which four exceedances are recorded.
b Equal to the maximum 1-hour incremental concentration divided by 24, plus corresponding background 24-hour average on that day.

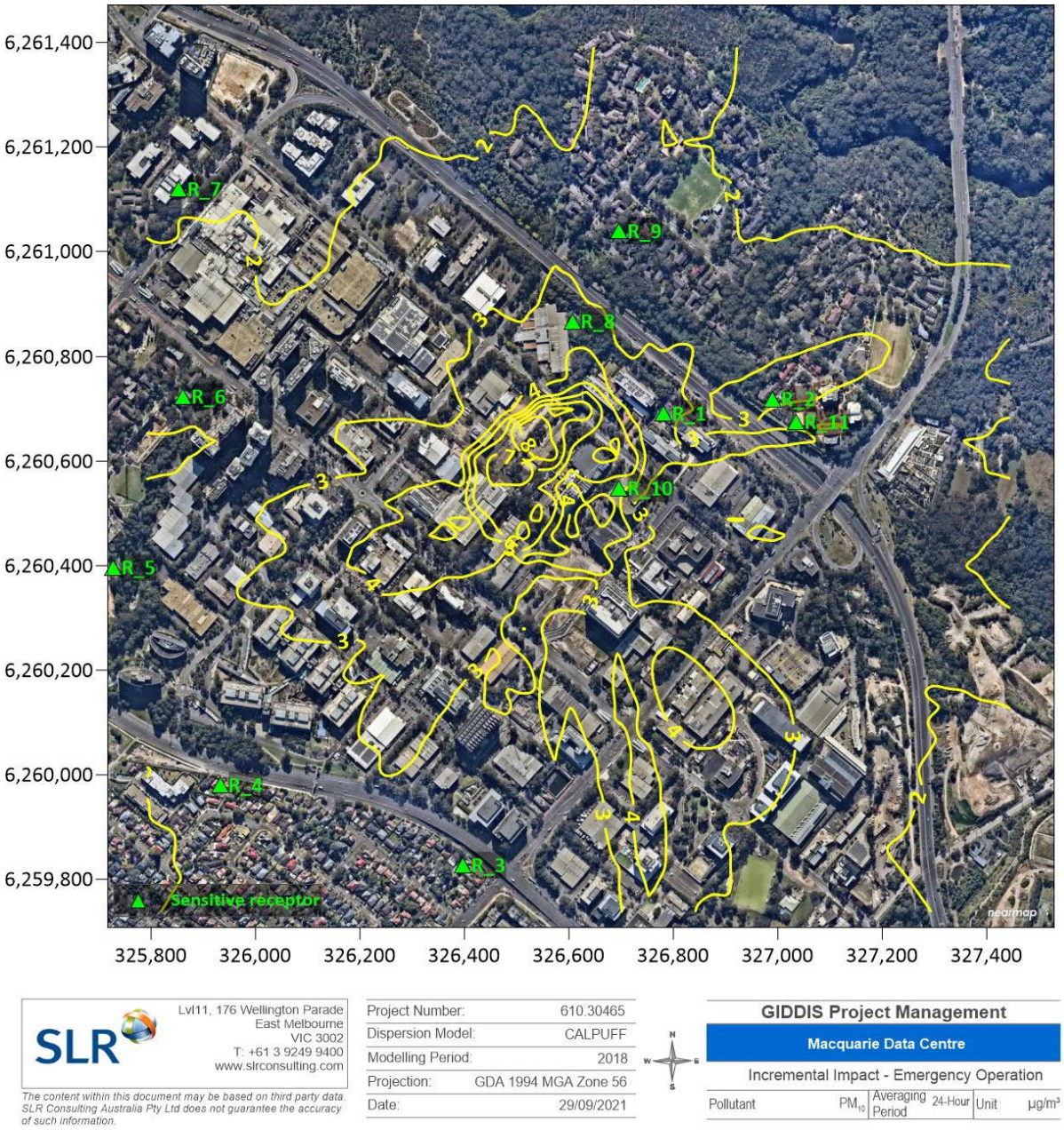


Figure 35 **Predicted 24-Hour Maximum Incremental PM Concentrations Based on Daily 1-Hour Emergency Condition (Source: SLR Consulting, 2021)**

A contemporaneous analysis of the highest 24-hour average PM_{10} and $PM_{2.5}$ concentrations predicted at the worst impacted receptor, R10 (roof air intakes on nearby commercial building rooftop), based on daily 1-hour emergency operation is presented in **TABLE 61**.

TABLE 61: TEN HIGHEST CONTEMPORANEOUS 24-HOUR AVERAGE PM10 AND PM2.5 PREDICTIONS AT RECEPTOR R10 IN EMERGENCY CONDITIONS

Date	24-Hour Average Concentration (µg/m^3)			Date	24-Hour Average Concentration (µg/m^3)		
	Background	Predicted Increment [a]	Cum. Impact		Background	Predicted Increment [a]	Cum. Impact
PM10							
Ten Highest Maximum Background Hours				**Ten Highest Maximum Incremental Impact Hours**			
22-11-2018	**86**	4.4	**90**	28-03-2018	22	6.9	29
21-11-2018	**70**	4.0	**74**	20-01-2018	14	6.7	21
19-03-2018	**60**	0.41	**60**	02-05-2018	14	6.3	21
15-02-2018	**52**	0.012	**52**	02-12-2018	33	6.2	39
18-07-2018	48	4.1	**52**	11-02-2018	14	6.2	27
13-04-2018	46	3.6	50	04-07-2018	16	6.2	22
08-08-2018	46	4.9	**51**	28-09-2018	21	6.1	20
09-08-2018	43	1.7	45	05-07-2018	10	6.1	16
19-07-2018	41	3.9	44	06-02-2018	14	6.0	14
20-03-2018	36	0.21	36	30-12-2018	21	6.0	34
Criterion			**50**				**50**
PM2.5							
Ten Highest Maximum Background Hours				**Ten Highest Maximum Incremental Impact Hours**			
09-08-2018	**58**	1.7	**60**	28-03-2018	6.3	6.9	13
08-08-2018	**42**	4.9	**47**	20-01-2018	3.4	6.7	10
13-04-2018	**29**	3.6	**32**	02-05-2018	5.7	6.3	12
26-05-2018	**28**	0.55	**28**	02-12-2018	7.9	6.2	14
27-05-2018	22	5.6	**28**	11-02-2018	5.9	6.2	14
28-05-2018	19	2.8	21	04-07-2018	9.6	6.2	16
21-11-2018	17	4.0	21	28-09-2018	7.4	6.1	12
15-07-2018	17	2.5	20	05-07-2018	5.9	6.1	12
17-09-2018	17	2.5	19	06-02-2018	6.4	6.0	9.2
19-03-2018	15	0.41	16	30-12-2018	10	6.0	17
Criterion			**25**				**25**

Note: Red font indicates exceedance of criterion (background or cumulative).
a Equal to the maximum 1-hour incremental concentration divided by 24.

Figure 36 and **Figure 37** present plots of the predicted cumulative PM_{10} and $PM_{2.5}$ impacts at the sensitive receptors during one year in descending order and illustrate the relatively small increase in exceedances at Receptor R10 over those caused by elevated background concentrations when an emergency operation of all generators is assumed one hour every day of the year.

The actual likelihood of emergency operation events and therefore exceedances of the PM_{10} and $PM_{2.5}$ criteria due to emergency conditions are discussed in the summary below.

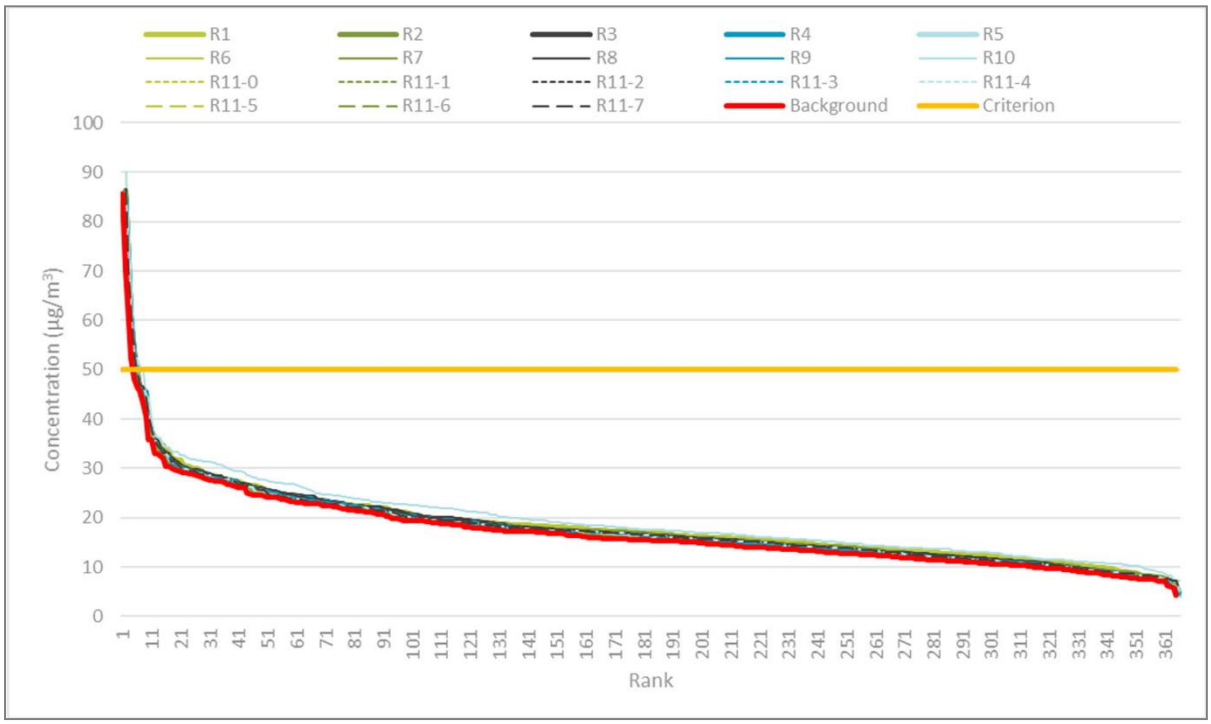


Figure 36 Predicted 24-Hour PM_{10} Cumulative Concentrations at Sensitive Receptors by Rank (Source: SLR Consulting, 2021)

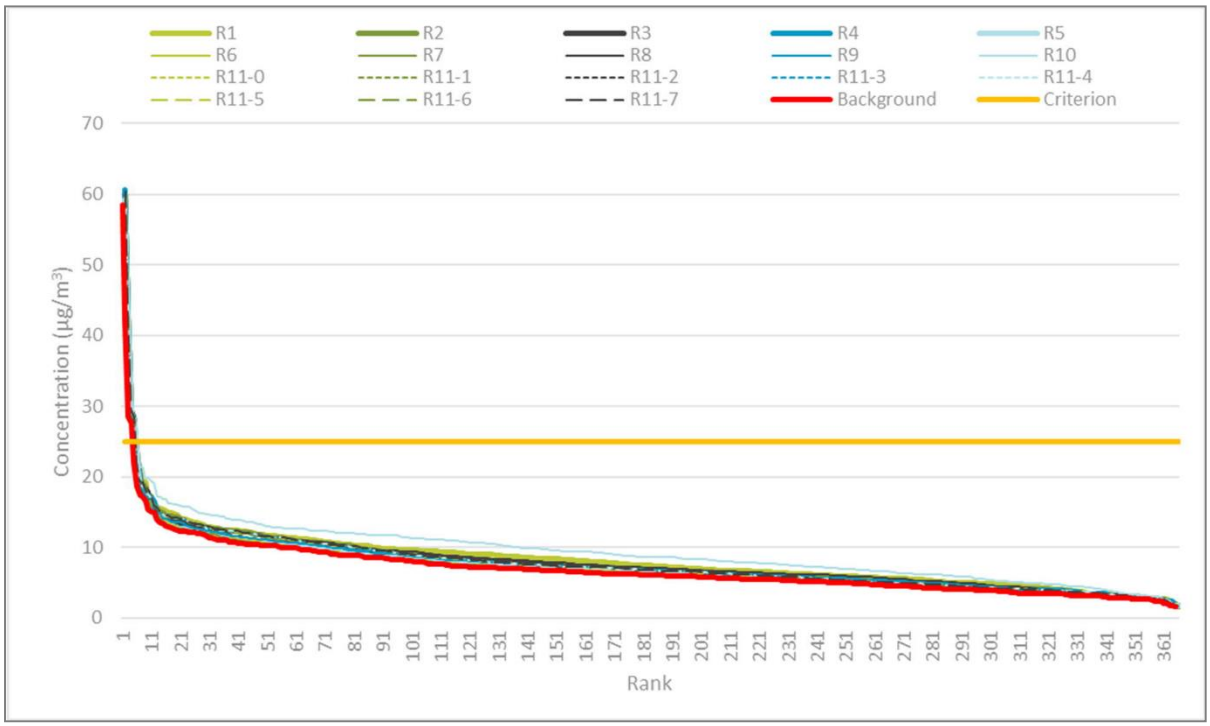


Figure 37 Predicted 24-Hour $PM_{2.5}$ Cumulative Concentrations at Sensitive Receptors by Rank (Source: SLR Consulting, 2021)

NO:

TABLE 62 presents the incremental and cumulative maximum 1-hour average NO_2 concentrations predicted at identified sensitive receptor locations. Isopleth plots of the predicted incremental NO_x concentrations are presented in **Figure 38**.

The modelling results show that the predicted cumulative maximum 1-hour and annual average NO_2 concentrations are below the relevant ambient air quality criteria at all receptor locations modelled.

TABLE 62: MAXIMUM PREDICTED NO_2 CONCENTRATIONS AT SENSITIVE RECEPTORS IN EMERGENCY CONDITIONS

ID	Incremental (µg/m³)							Cumulative (µg/m³)	
	Maximum 1-Hour	Corresponding 1-Hour [a]					Annual	1-Hour	Annual
		NO_X (µg/m³)	O_3 (ppb)	Wind Speed (m/s)	Transport Time (s) [b]	NO_2 (µg/m³)			
R1	62	4232	30	4.6	44	1.9	6.0	87	16
R2	88	3331	18	2.5	160	7.5	6.2	107	17
R3	183	3556	3.0	2.2	367	1.9	6.1	195	17
R4	171	2479	44	2.9	310	3.8	5.8	174	16
R5	150	2606	19	2.1	425	10	2.5	161	13
R6	128	2654	39	2.1	355	0.0	2.1	150	13
R7	128	2103	29	2.9	333	1.9	2.6	130	13
R8	87	3979	36	3.7	81	3.8	6.2	116	17
R9	90	2480	35	4.5	112	13	5.2	118	16
R10	35	6364	42	6.2	8.0	1.9	3.0	64	13
R11-0	128	4332	19	3.2	140	7.5	6.0	135	16
R11-1	128	4330	19	3.2	140	7.5	6.0	135	16
R11-2	128	4325	19	3.2	140	7.5	6.0	135	16
R11-3	127	4316	19	3.2	140	7.5	6.0	135	16
R11-4	127	4302	19	3.2	140	7.5	6.0	134	16
R11-5	126	4285	19	3.2	140	7.5	6.1	134	17
R11-6	126	4264	19	3.2	140	7.5	6.1	133	17
R11-7	125	4237	19	3.2	140	7.5	6.1	132	17
Criteria								**246**	**62**

Note: a Used to calculate 1-hour incremental NO2 concentration using Method 3 (Section 8.3.2 of AQIA).
b Approximate plume transport time from source to receptor based on windspeed and separation distance.

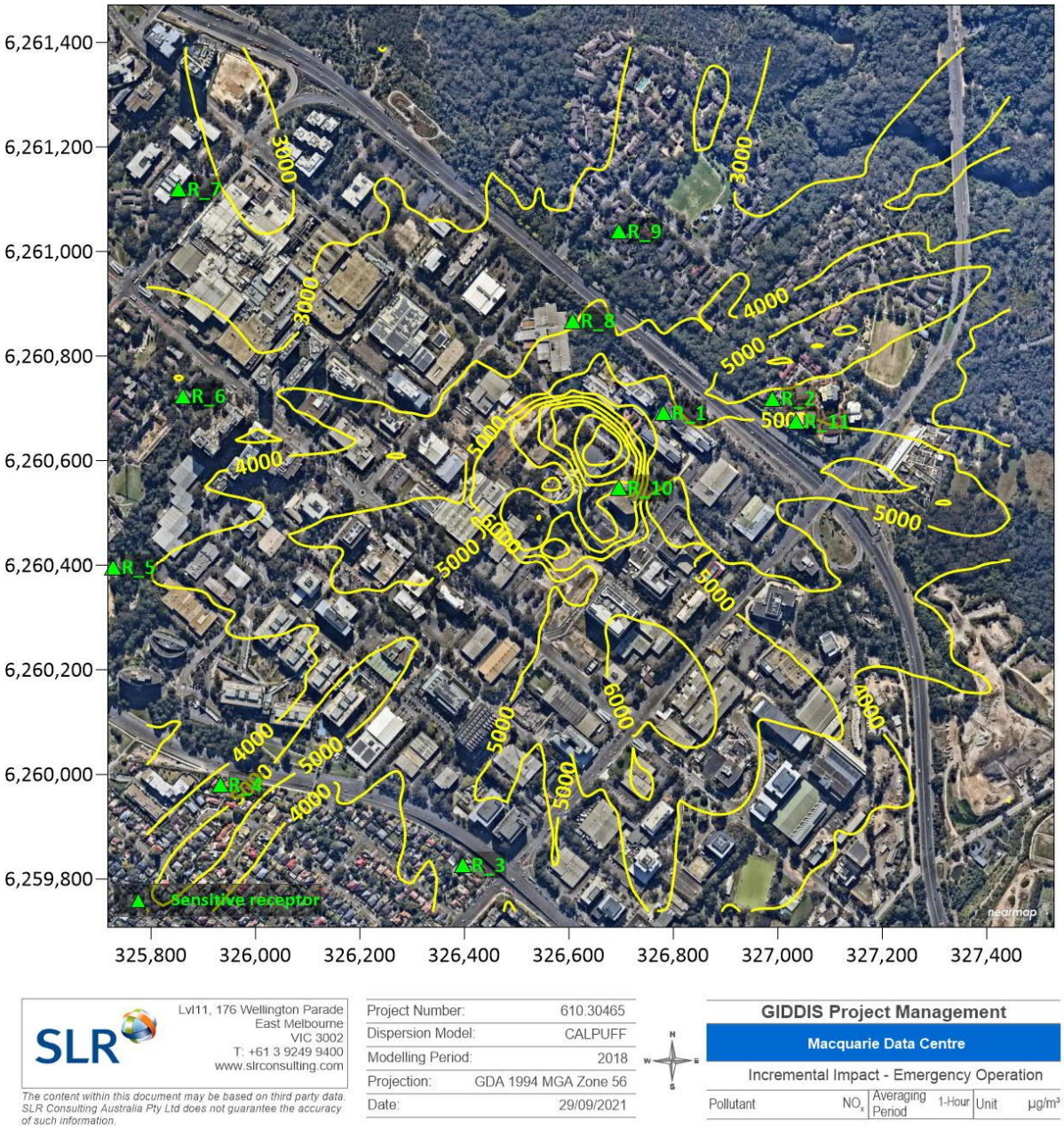


Figure 38 **Predicted 1-hour Average Incremental NOX Isopleth Plot – Emergency Conditions (Source: SLR Consulting, 2021)**

CO:

TABLE 63 presents the maximum incremental 15-minute, 1-hour and 8-hour average CO concentrations predicted at surrounding sensitive receptor locations. Given the insignificant incremental increase of CO predicted at the identified receptors, exceedances of the relevant CO criteria due to the operation of the Project are considered unlikely.

TABLE 63: MAXIMUM PREDICTED CO CONCENTRATIONS AT SENSITIVE RECEPTORS IN EMERGENCY CONDITIONS

ID	Increment (mg/m³)		
	15-Minute*	1-Hour	Maximum 8-Hour
R1	0.75	0.57	0.53
R2	0.71	0.53	0.39
R3	0.59	0.44	0.34

TABLE 63: MAXIMUM PREDICTED CO CONCENTRATIONS AT SENSITIVE RECEPTORS IN EMERGENCY CONDITIONS			
ID	**Increment (mg/m³)**		
	15-Minute*	**1-Hour**	**Maximum 8-Hour**
R4	0.48	0.36	0.20
R5	0.44	0.33	0.21
R6	0.46	0.35	0.24
R7	0.37	0.28	0.19
R8	0.74	0.56	0.49
R9	0.53	0.40	0.28
R10	1.4	1.0	0.72
R11-0	0.67	0.51	0.39
R11-1	0.67	0.51	0.39
R11-2	0.67	0.51	0.39
R11-3	0.67	0.51	0.39
R11-4	0.67	0.51	0.39
R11-5	0.67	0.51	0.40
R11-6	0.67	0.51	0.40
R11-7	0.66	0.50	0.41
Criteria	**100**	**30**	**10**
Note: * The 1-hour average CO concentrations predicted by the modelling were converted to 15-minute averages using the power law formula.			

SO_2:

TABLE 64 presents the incremental maximum 10-minute, 1-hour, 24-hour and annual average SO_2 concentrations predicted at surrounding sensitive receptor locations Given the insignificant incremental increase of SO_2 predicted at the identified receptors, exceedances of the relevant SO_2 criteria due to the operation of the Project are considered unlikely.

TABLE 64: MAXIMUM PREDICTED SO_2 CONCENTRATIONS AT SENSITIVE RECEPTORS IN EMERGENCY CONDITIONS			
ID	**Increment (µg/m³)**		
	Maximum 10-Minute*	**Maximum 1-Hour**	**Maximum 24-Hour**
R1	2.7	1.9	1.3
R2	2.2	1.5	0.92
R3	1.9	1.3	0.52
R4	1.5	1.1	0.42
R5	1.5	1.1	0.21
R6	1.3	0.9	0.26
R7	1.2	0.8	0.30
R8	1.9	1.3	0.83
R9	1.6	1.1	0.52
R10	3.7	2.6	2.1
R11-0	2.4	1.7	0.83
R11-1	2.4	1.7	0.83
R11-2	2.4	1.7	0.84
R11-3	2.4	1.7	0.84

TABLE 64: MAXIMUM PREDICTED SO_2 CONCENTRATIONS AT SENSITIVE RECEPTORS IN EMERGENCY CONDITIONS			
ID	**Increment (µg/m³)**		
	Maximum 10-Minute*	**Maximum 1-Hour**	**Maximum 24-Hour**
R11-4	2.4	1.7	0.84
R11-5	2.4	1.7	0.84
R11-6	2.4	1.6	0.85
R11-7	2.3	1.6	0.85
Criteria	**712**	**570**	**228**
Note:	* The 1-hour average SO_2 concentrations predicted by the modelling were converted to 10-minute averages using the power law formula.		

PAHs:

The maximum (99.9th percentile) incremental 1-hour average PAH concentrations predicted beyond the Site boundary was 0.0000011 mg/m³ significantly less (<03%) than the criterion of 0.0004 mg/m³. For the purposes of modelling, background PAH concentrations were assumed to be negligible. Regardless, it is unlikely that the addition of the incremental impacts to a background concentration would cause an exceedance.

TABLE 65 presents the incremental maximum 1-hour average PAH concentrations predicted at surrounding sensitive receptor locations.

TABLE 65: PREDICTED PAH CONCENTRATIONS AT RESIDENTIAL RECEPTORS IN EMERGENCY CONDITIONS	
ID	**Maximum^ Increment 1-Hour (mg/m³)^**
R1	<0.000001
R2	<0.000001
R3	<0.000001
R4	<0.000001
R5	<0.000001
R6	<0.000001
R7	<0.000001
R8	<0.000001
R9	<0.000001
R10	0.0000011
R11-0	<0.000001
R11-1	<0.000001
R11-2	<0.000001
R11-3	<0.000001
R11-4	<0.000001
R11-5	<0.000001
R11-6	<0.000001
R11-7	<0.000001
Criteria	**0.0004**
Note:	^ 99.9th percentile

The dispersion modelling study, which accounted for the emergency conditions (all generators running) every hour of the year predicted no exceedances of the NO_2, CO, SO_2 or PAH ambient air quality criteria.

No additional exceedances (over background) of the PM_{10} and $PM_{2.5}$ 24-hour average criteria were predicted due to the project for any of the receptors with the exception of R10 for which two additional exceedances of the PM_{10} criterion and one additional exceedance of the $PM_{2.5}$ criterion were predicted.

A comprehensive worst-case assessment was achieved by modelling the emergency conditions (operation of all backup generators) for every hour of the year to account for all meteorological and background air quality conditions. From these predictions the daily 1-hour maximum incremental concentrations, divided by 24, were added to the daily 24-hour average background concentration representing 1-hour emergency operation every day of the year. This assessment conservatively assumes that the emergency operation would occur on the hour associated with the meteorological conditions that result in the maximum 1-hour average concentration for that day. The likelihood of exceedances under these assumptions is the equivalent of:

- 1 exceedance every 0.5 years for PM_{10}
- 1 exceedance every year for $PM_{2.5}$.

However, if more realistically, an emergency condition event lasting 1 hour was conservatively assumed to occur once per year, rather than every day, and conservatively occurred on the hour of day that resulted in the maximum 1-hour average concentration for that day, the likelihood of this resulting in an exceedance would be equal to 1/365th of the predicted likelihoods above, equivalent to:

- 1 exceedance every 183 years for PM_{10}
- 1 exceedance every 365 years for $PM_{2.5}$.

At the time of writing, information on the historical power interruptions at the site was unavailable. A recent study conducted by SLR for a similar facility in Eastern Creek observed the following for that site:

- The site had had two power interruptions in the past ten years.
- Each interruption consisted of the loss of one of four feeder supplies.
- The two interruptions lasted for 13 minutes and 21 minutes, respectively.
- Loss of one feeder to that site did not require all generators to be used for emergency power.

Assuming similar network performance supplying the project, it can be concluded that the actual likelihood of an exceedance of the air quality criteria at nearby sensitive receptors due to the emergency operation of the project is negligible.

6.1.6.8 Air quality monitoring program

Construction phase monitoring:

The AQIA concludes that the risk of construction dust emissions causing nuisance impacts at off-site sensitive receptor locations is low. It is also noted that any impacts will be temporary and managed through the implementation of appropriate mitigation measures.

Considering the low risk from the construction dust emissions to cause nuisance at off-site sensitive receptor locations, dust monitoring at the nearest sensitive receptors is not considered necessary.

However utilising static dust gauge(s) for the duration of project construction, started at least one month before commencement of construction work, would be an inexpensive monitoring method that could be used to demonstrate that dust emissions are being managed effectively.

A summary of the proposed nuisance dust monitoring program is shown in **TABLE 66**.

TABLE 66: NUISANCE DUST MONITORING PROGRAM

Parameter	Methodology	Duration	Location	Frequency
Deposited dust	AS/NZS 3580.1.1:2016 - Methods for sampling and analysis of ambient	During site preparation, earthworks,	Inside site boundary (to be confirmed	Monthly

TABLE 66: NUISANCE DUST MONITORING PROGRAM				
Parameter	**Methodology**	**Duration**	**Location**	**Frequency**
	air - Guide to siting air monitoring equipment	construction	by monitoring subconsultant)	

An air quality contingency management plan for the project construction, based on the monitoring approach outlined above, is provided in **TABLE 67**.

TABLE 67: NUISANCE DUST CONTINGENCY MANAGEMENT PLAN FOR PROJECT		
Trigger	**Dust Deposition Rate <4 g/m²/month**	**Dust Deposition Rate >4 g/m²/month**
Response	No response required. Continue monitoring program.	Review and investigate construction activities and respective control measures, where appropriate. Implement additional remedial measures, such as:

Operational phase monitoring:

Given the nature and scale of the proposed standard operation test activities, with predicted ground level concentrations within the assessment criteria limits it is not anticipated that any impacts upon human health or amenity values would be experienced during the operational phase. Therefore, monitoring of air quality is not considered to be required during the operational phase.

The emergency conditions scenario, based on a number of cumulative assumptions, does show exceedances, however, considering the nature of these results and the conclusion regarding the normal operations above the results from the worst-case operations scenario does not justify the need for any monitoring.

6.1.6.9 Mitigation measures

Construction phase mitigation measures:

The SEARs require an environmental risk analysis to identify potential environmental impacts associated with the Project. The following represents the way in which risks, impacts and mitigation measures are identified and quantified in relation to dust management at the Project.

This analysis comprises a qualitative assessment consistent with *AS/NZS ISO 31000:2009 Risk Management– Principles and Guidelines* (Standards Australia 2009). The level of risk was assessed by considering the potential impacts of the Project prior to application of any mitigation or management measures.

Risk comprises the likelihood of an event occurring and the consequences of that event. For the project, the descriptors shown in **TABLE 68** were adopted for 'likelihood' and 'consequence'.

TABLE 68: AIR QUALITY RISK DESCRIPTORS			
Likelihood		**Consequence**	
A	Almost certain	**1**	Widespread and/or irreversible impact
B	Likely	**2**	Extensive but reversible (within 2 years) impact or irreversible local impact
C	Possible	**3**	Local, acceptable or reversible impact
D	Unlikely	**4**	Local, reversible, short term (<3 months) impact
E	Rare	**5**	Local, reversible, short term (<1 month) impact

The risk levels for likely and potential impacts were derived using the risk matrix shown in **TABLE 69**.

TABLE 69: AIR QUALITY RISK MATRIX						
Consequence	Likelihood					
		A	**B**	**C**	**D**	**E**
	1	High	High	Medium	Low	Very Low
	2	High	High	Medium	Low	Very Low
	3	Medium	Medium	Medium	Low	Very Low
	4	Low	Low	Low	Low	Very Low
	5	Very Low	Very Low	Very Low	Very Low	Very Low

The risk assessment and mitigations measures are shown in **TABLE 70**.

TABLE 70: AIR QUALITY RISK ASSESSMENT AND MITIGATION MEASURES					
Matter	**Potential Impact**	**Likelihood**	**Consequence**	**Risk Level**	**Proposed Mitigation Measures**
Air Quality	PM_{10} health impacts on nearby sensitive receptors from construction phase	E	4	Very Low	No mitigation required for PM_{10} specifically. Note that measures for dust soiling (below) will likely also reduce the potential impact of PM10.
	Dust soiling (nuisance) impacts on nearby receptors from construction phase	D	4	Low	Develop a Construction Environmental Management Plan (CEMP) adopting appropriate and relevant measures.

Operational phase mitigation measures:

Given the worst-case operating scenario modelled predicted compliance with all relevant air quality impact assessment criteria, and the extremely low probability of the exceedances due to emergency conditions, installation of pollution control devices on generators at this initial stage is not deemed necessary. However, retrofittable pollution control devices capable of significantly reducing pollutant levels from the generators are available and should be installed at a later stage if change in circumstances mean generators require to be operated on a more frequent basis than has been assumed by this air quality impact assessment.

Conclusion:

The main potential sources of air emissions were identified as suspended particulate matter and deposited dust during the construction stage and combustion gases and particulate matter during the operational stage of the project.

The potential for off-site air quality impacts during the construction stage of the project were assessed using a qualitative risk-based approach, concluding that given the nature of the operations proposed, the location of the Site and the local meteorological conditions, exceedances of the relevant air quality criteria are unlikely.

The potential for off-site air quality impacts during the operational stage of the project were conservatively assessed quantitatively using dispersion modelling techniques in general accordance with the Approved Methods. The dispersion modelling study, which accounted for worst-case testing conditions predicted no exceedance of the relevant ambient air quality because of the operation of the project.

The dispersion of emissions due to emergency conditions, where loss of all feeders to the site requiring all generators to operate simultaneously, was conservatively modelled and predicted compliance with the PM_{10} and $PM_{2.5}$ 24-hour average criterion at all receptors with the exception of

the nearest, which represented the potential rooftop air intakes of the neighbouring building. However, the predicted likelihood of an exceedance coupled with the likelihood of an emergency condition event happening was demonstrated to result in a vanishingly small chance of an exceedance occurring.

Nevertheless, it is recommended that retrofittable pollution control devices capable of significantly reducing pollutant levels from the generators should be available to be installed at a later stage if a change in operating conditions deems this necessary.

It is concluded that air quality issues do not pose a constraint for the project.

6.1.7 Traffic and transport

This section of the EIS evaluates the traffic and transport aspects of the proposed development, in relation to the SEARs and addresses the following specific matters:

- ***details of all traffic types and volumes likely to be generated during construction and operation of the development (light and heavy vehicles, public transport, pedestrian and cycle trips), including maps depicting the key access routes for each transport mode;***
- ***an assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including consideration of cumulative traffic impacts at key intersections (Lane Cove Road/Talavera Road and Talavera Road/Khartoum Road intersections) using SIDRA or similar modelling;***
- ***details of the number of proposed car parking spaces and compliance with the appropriate parking standards/guidelines;***
- ***detailed plans of the internal road network, loading dock arrangements and proposed pedestrian and cyclist facilities (including end of trip facilities), in accordance with relevant Australian Standards;***
- ***details of any existing or proposed access points for the development, including any interactions with existing operations;***
- ***details of the largest vehicle anticipated to access and move within the site, including swept path analysis; and***
- ***details of the proposed traffic mitigation, management and monitoring measures, including draft versions of any associated management plans.***

A Transport Impact Assessment has been prepared by The Transport Planning Partnership, which includes a full assessment of all traffic and transport related impacts that may arise from the development proposed under this SSD Application. The Transport Assessment forms **Appendix 16** of this EIS.

6.1.7.1 Traffic types and volumes

Construction phase:

All construction vehicles will use the existing internal access road to travel within the works site. This construction site access and internal access road will facilitate the following vehicles:

- Small utility vehicles
- Concrete agitators
- Medium Rigid Vehicles (MRVs)
- Heavy Rigid Vehicles (HRVs)
- 19m long truck and dogs
- 19m long semi-trailers.

Construction activities will generally be carried out by small to heavy rigid vehicles, no larger than a 12.5m long heavy rigid vehicle. It may also be necessary to use 19m long articulated vehicles for larger deliveries to/from the works site (e.g. delivery of plant equipment).

Swept path analysis has been undertaken using a 12.5m long heavy rigid vehicle and 19m long articulated vehicle, and included within **Section 6.1.7.6** of this EIS.

Generally, construction vehicles would have origins and destinations throughout Sydney. Dedicated construction vehicle routes have been developed to provide the shortest distances to/from the arterial road network, whilst minimising the impact of construction traffic on local streets within the vicinity of the site.

All truck drivers will be advised of the designated truck routes to/from the site and be required to adhere to the nominated routes.

On a local level, the designated truck routes to/from the works site shall be provided off Talavera Road in order to travel to/from the wider arterial road network via Lane Cove Road and the M2 Motorway as shown in **Figure 39**.

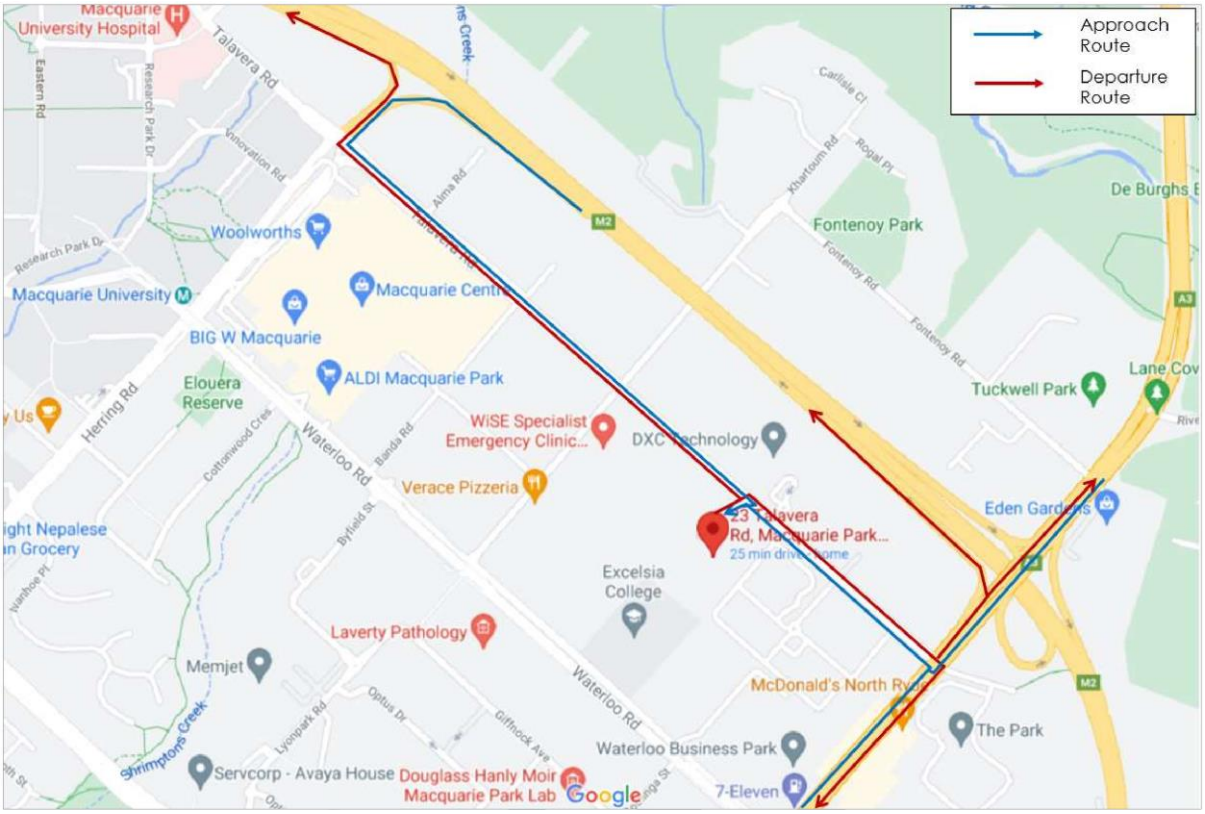


Figure 39 Nominated Construction Vehicle Routes (Source: TTPP, 2021)

All materials handling and plant equipment, including waste storage, are expected to be wholly stored on-site within the work site. It is not expected that any public road will be required for such purposes. However, if temporary use of any public road is required for temporary storage purposes or the like, prior consultation with Council will be undertaken. All relevant permit approvals will also be obtained prior to the commencement of such activities.

No works zone will be required as part of the works. All loading and unloading will occur wholly within the site.

The construction traffic generated by the proposed construction activities, in each stage, are presented in **TABLE 71**.

TABLE 71: CONSTRUCTION TRAFFIC GENERATION		
Construction Stage	**Construction Activities**	**Daily Construction Traffic Generation**
1	Site establishment and civil works	Up to 30 construction vehicles
2	Building construction	40 construction vehicles
3	Building fit-out	Up to 50 construction vehicles for material delivery

From **TABLE 71**, it is anticipated that there would be up to 50 construction vehicles generated from the proposed construction activities of the site. In addition, it is anticipated that there would be up to 7 vehicles (7 in; 7 out) per hour during the busiest period.

With the proposed extension of the construction hours, as mentioned in **Section 3.2.5** of this EIS, the additional traffic movements from the proposed construction activities are not expected to cause any discernible adverse impacts to the state road network.

Operational phase:

Similar to the approved development, the site will be serviced by the following vehicles:

- 8.8m MRV for delivery and waste collection.
- 12.5m HRV for large delivery and emergency vehicle access including fire trucks.
- 19m Articulated Vehicle (AV) to accommodate plant upgrades on a very rare basis, that is, once or twice a year.

The proposed access arrangements for the service vehicles are described below.

8.8m MRV Access

All MRVs, which include delivery and waste collection trucks and light vehicles will only enter and exit the site via the western driveway. This driveway would be monitored by site personnel to allow regular deliveries, waste vehicles, staff and visitors to enter and exit the site.

12.5m HRV Access

All HRVs, which include large delivery and emergency vehicles including fire trucks will enter and exit the site via the eastern driveway. The site operational manager will be notified in advance regarding the service vehicle arrival of both AVs and HRVs. The eastern driveway will have two new sliding gates.

19m AV Access

19m AV will require access on a very rare basis, that is once or twice a year to accommodate plant upgrades to the data centre. 19m AV can enter the site via eastern driveway, making a right turn in from Talavera Road. Similar to HRV access, the site operational manager will be notified in advance on the arrival of 19m AV. 19m AV will circulate around the site and exit via the western driveway, making a right turn out to Talavera Road.

Swept path analysis has been undertaken using a 19m long AV, and included within **Section 6.1.7.6** of this EIS.

6.1.7.2 Modes of transport

Road network:

The local road network surrounding the subject site includes Lane Cove Road, Talavera Road and Khartoum Road. These roads are discussed below.

Lane Cove Road

Lane Cove Road is an RMS classified State Road (A3) and forms one of the major north-south arterial links in the northern/ north-western suburbs. The road provides good connectivity to the wider arterial road network, notable to Ryde Road, M2 Motorway, Victoria Road and Devlin Street. Within the vicinity of the site, Lane Cove Road runs in a north-east to south-west direction. The road provides three through traffic lanes in each direction separated by a central median. The road has a posted speed limit of 70 km/h in both directions within the vicinity of the site.

Talavera Road

Talavera Road is a regional road, generally aligned in the north-west to south-east direction along the frontage of the site. The road carriageway measures approximately 15m kerb to kerb with restricted

kerbside parking permitted along both sides of the road near the site. This includes ticketed parking for five hours between 10:00am and 3:00pm, Monday to Friday. Talavera Road has a posted speed limit of 50km/h.

Khartoum Road

Khartoum Road is a local road, generally aligned in the north-east to south-west direction. The road carriageway measures approximately 12m kerb to kerb with restricted kerbside parking permitted along both sides of the road. This includes ticketed parking for five hours between 10:00am and 3:00pm, Monday to Friday and parking for twelve hours between 7:00am and 7:00pm, Monday to Friday. Khartoum Road has a posted speed limit of 50km/h.

Public Transport:

The closest metro station is Macquarie Park Station, located 950m walking distance from the site (13-minutes walk). Macquarie Park Station services the Tallawong to Chatswood line with services running every 4 minutes during the peak hours and every 10 minutes in the off-peak hours.

The subject site is located within proximity to both high frequency bus services. There are several bus stops close to the site, located on Talavera Road and Lane Cove Road.

There is sufficient public transport provision in the immediate vicinity of the site. **Figure 40** shows a map of the existing bus network surrounding the site.

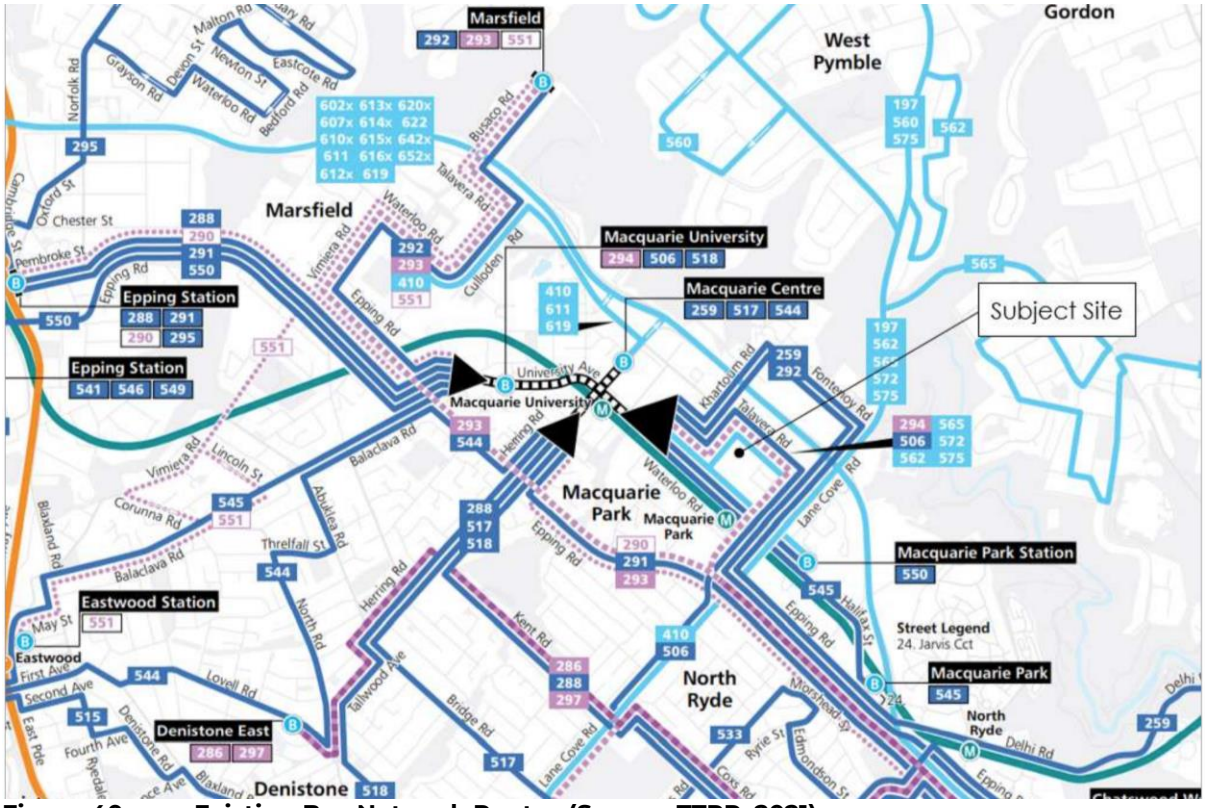


Figure 40 Existing Bus Network Routes (Source: TTPP, 2021)

The proposed construction activities would not impact existing public transport services.

Pedestrian and Cycling Facilities:

In the immediate vicinity of the subject site, pedestrian paths are provided on both sides of Talavera Road. Footpaths along these roads extend onto the wider network, providing passage on foot onto Lane Cove Road and Khartoum Road.

There are a number of off-road shared cycle paths near the site, with the main routes providing travel to Macquarie Park University, Epping and North Ryde. On-road cycle lanes surrounding the site also provide good cycle connectivity to the wider road network.

Pedestrian and cycle safety shall be maintained at all times, particularly when trucks are entering and exiting the site. If applicable, all relevant permit approvals will be obtained from Council, prior to the commencement of any work.

6.1.7.3 Traffic impact assessment

As part of SEARs requirements for this development, TfNSW has requested modelling of the site for the future years 2026, 2031 and 2036.

Design Generation:

For the purpose of traffic modelling, The Transport Planning Partnership has conservatively assessed the traffic generation arising from the whole building, including trips generated by the existing buildings. For the whole site, a total of 49 employees are expected to be staffed. Using travel mode surveys of existing staff, it is understood that 77 percent of employees drive to work. Hence, the site could potentially generate 23 vehicle trips per hour in the AM and PM peak periods.

Distribution and Assignment:

The directional distribution and assignment of traffic generated by the proposed development will be influenced by a number of factors, including the:

- configuration of the arterial road network in the immediate vicinity of the site
- existing operation of intersections providing access between the local and arterial road network
- total 'cost' of each route choice (including time, comfort, simplicity and monetary costs)
- distribution of households in the vicinity of the site
- likely distribution of employee's residences in relation to the site
- configuration of access points to the site.

Having consideration to the above, for the purposes of estimating vehicle movements, the following trip distribution percentages are adopted:

- 50% of trips will be generated to/ from the west
- 50% of trips will be generated to/from the east.

In addition, it is presumed that:

- 80% of the trips in the AM peak are inbound
- 20% of the trips in the AM peak are outbound
- 20% of the trips in the PM peak are inbound
- 80% of the trips in the PM peak outbound.

Based on the above, **Figure 41** and **Figure 42** have been prepared to show the estimated marginal increase in turning movements near the subject site following full site development.

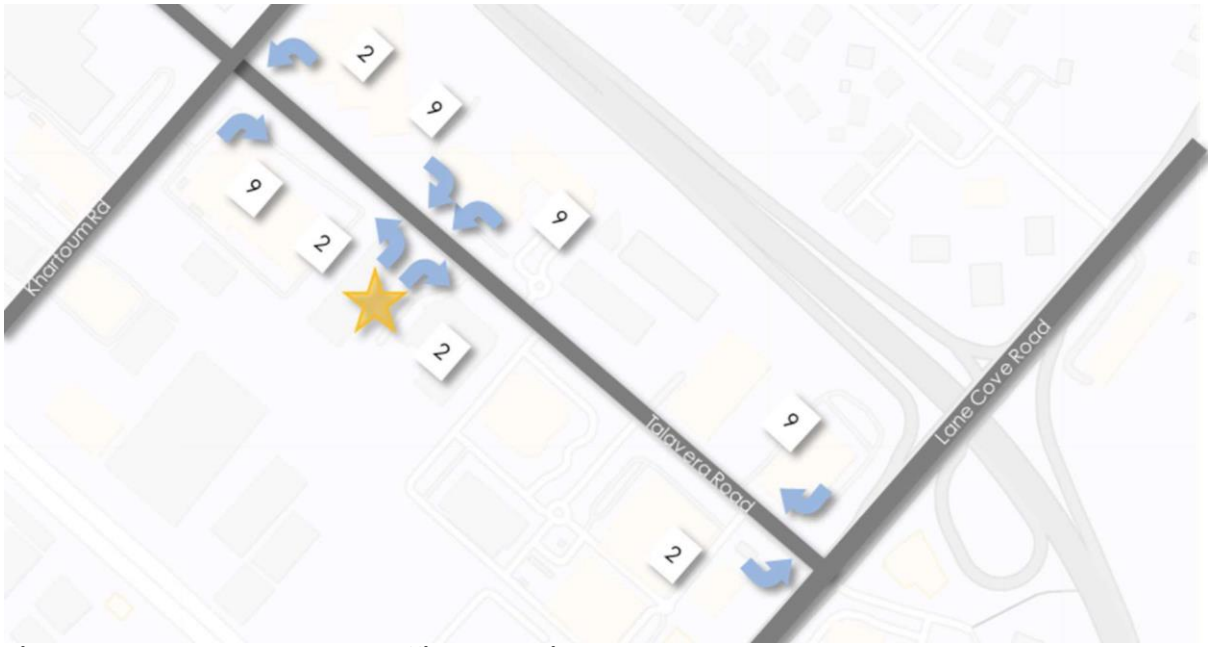


Figure 41 Assumed AM traffic generation (Source: TTPP, 2021)

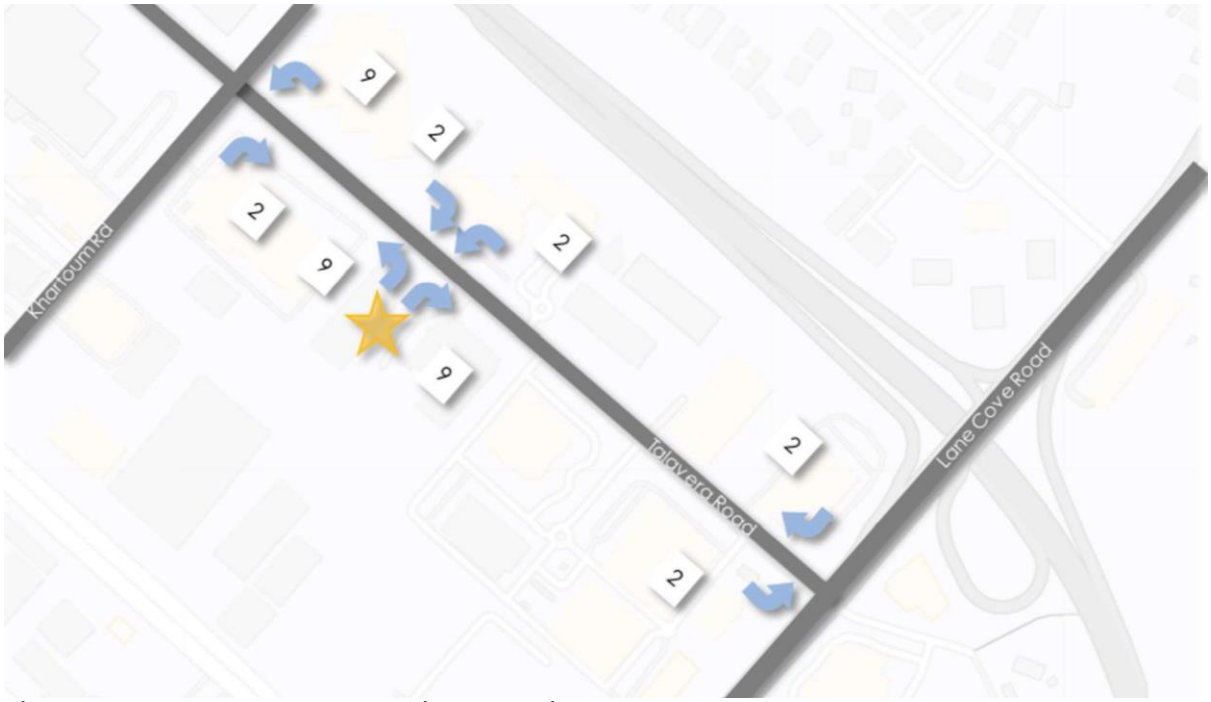


Figure 42 Assumed PM traffic generation (Source: TTPP, 2021)

SIDRA Modelling:

Modelling Outline

The network impact assessment and associated SIDRA modelling covers the following intersections:

- Lane Cove Road/ Talavera Road (User-given cycle time – 120 seconds)
- Talavera Road/ Khartoum Road (including upgrades planned for 2036, user-given cycle time – 150 seconds).

The modelling covers the AM and PM peak hours for the following future years:

- 2026 base case

- 2026 with development
- 2031 base case
- 2031 with development
- 2036 base case (upgraded geometry on Talavera/ Khartoum Road)
- 2036 with development.

To estimate future year volumes, TfNSW's Strategic Traffic Forecasting Model (STFM) data has been used to apply linear annual growth rates to 2017 data.

Assumptions and Data

Due to lockdown conditions at the time of writing this report, traffic volume surveys could not be conducted to understand existing traffic conditions. Hence, historic surveys from 2017 have been used as base data. STFM data projecting from 2019 to 2026, 2031 and 2036 have been used to extrapolate the data from 2017 to the respective subject years. Hence, it is assumed that 2017 to 2019 have the same growth rates as those for later years. The operation of the key intersections within the study area have been assessed using SIDRA INTERSECTION (SIDRA), a computer-based modelling package which calculates intersection performance. The commonly used measure of intersection performance, as defined by the TfNSW, is vehicle delay. SIDRA determines the average delay that vehicles encounter and provides a measure of the level of service. **TABLE 72** shows the criteria that SIDRA adopts in assessing the level of service.

TABLE 72: SIDRA LEVEL OF SERVICE CRITERIA

Level of Service (LOS)	Avereage delay per vehicle (s/veh)	Implication – traffic signlas & roundabouts	Implication – give way & stop signs
A	Less than 14	Good operation	Good operation
B	14 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	28 to 42	Satisfactory	Satisfactory, but accident study required
D	42 to 56	Near capacity	Near capacity, accident study required
E	56 to 70	At capacity, at signals incidnts will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Results

TABLE 73 presents a summary of the operation of the above intersections in 2026, 2031 and 2036. Detailed SIDRA results are included in Appendix D of the Transport Impact Assessment contained within **Appendix 16** of this EIS.

TABLE 73: MODELLED NETWORK CONDITIONS

Intersection	Peak	Scenario	2026		2031		2036	
			Average delay (s)	LOS	Average delay (s)	LOS	Average delay (s)	LOS
Lane Cove Road / Talavera Road	AM	No development	188	LOS F	268	LOS F	255	LOS F
		With development	193	LOS F	272	LOS F	286	LOS F
	PM	No development	> 5 mins	LOS F	208	LOS F	216	LOS F
		With development	> 5 mins	LOS F	209	LOS F	216	LOS F
Talavera Road / Khartoum	AM	No development	> 5 mins	LOS F	> 5 mins	LOS F	225	LOS F
		With development	> 5 mins	LOS F	> 5 mins	LOS F	230	LOS F
	PM	No development	122	LOS F	140	LOS F	207	LOS F

Road		With development	129	LOS F	151	LOS F	214	LOS F

It is noted that using TfNSW's provided STFM growth rates, both intersections in the network will operate poorly under base conditions in future years. However, the proposed development is expected to generate at most, 23 vehicle trips per hour in the AM and PM peak period. This equates to one vehicle movement every two to three minutes, which is considered negligible. Hence, the proposed development traffic is considered minimal and could not be expected to result in any noticeable traffic impacts on the surrounding road network.

Also in comparison with other nearby large commercial developments, the proposed expansion of the data centre would generate significantly less vehicle trips during the commuter peak periods.

6.1.7.4 Parking

The parking assessment for the proposal has been assessed against the RDCP2014.

The RDCP2014 states that for a new floor space in non-residential land uses, a maximum of 1 space per 60m^2 can be applied. For an additional floor space of 9,097m^2, a maximum of 151 additional spaces is permitted.

The previous development was approved with 71 on-site car parking spaces. It proposed to maintain the previously approved 71 car parking spaces. Hence, no additional car parking spaces will be proposed on site as part of the proposed expansion.

It is noted that RDCP2014 car parking requirement is set at maximum rates, hence the proposed car parking provision complies with the RDCP2014.

Also, the travel mode surveys undertaken by existing staff and visitors indicated the following mode splits:

- 77% car
- 22% public transport
- 1% walk.

It is estimated that a total number of staff and visitors is expected to be around 92 persons on a typical day. Applying 77% car mode, this would generate a parking demand of 71 spaces. A total of 71 car parking spaces will be provided on-site, which meets the peak parking demand

6.1.7.5 Internal arrangements

Reference should be made to the proposed Architectural Plans, within **Appendix 7** of this EIS, which depict the provision of:

- An additional 2 x internal loading docks
- Onsite parking for 71 vehicles
- Standing space for an AV

6.1.7.6 Swept path analysis

Refer to Appendix B of the Transport Impact Assessment, prepared by The Transport Planning Partnership, which is contained within **Appendix 16** of this EIS.

6.1.7.7 Traffic mitigation, management and monitoring

Construction staff parking:

Limited on-site vehicle parking will be available during construction. The existing site will be in operation and parking will be utilised by the employees. All construction workers will be encouraged and expected to use public transport and/or carpool to travel to/from the site.

This will be incorporated in the workers induction program to ensure minimal parking impact on surrounding streets.

Construction traffic management:

A preliminary CTMP has been prepared to support the proposed development, and forms **Appendix 17** of this EIS. MDC is committed to formalising this document to ensure that construction traffic impacts are mitigated where necessary, or otherwise managed.

6.1.8 Hazards and risk

This section of the EIS assesses the potential hazards and risk associated with the proposed development, in particular the following matters requested by the SEARS:

- ***a preliminary risk screening completed in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development and Applying SEPP 33 (DoP, 2011), with a clear indication of class (and any subsidiary hazard), quantity and location of all dangerous goods and hazardous materials associated with the development. Should preliminary screening indicate that the development is "potentially hazardous" a Preliminary Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 – Hazard Analysis (DoP, 2011) and Multi-Level Risk Assessment (DoP, 2011)***
- ***details regarding the location and number of any back-up generators, back-up fuel storage tanks and lithium-ion or other battery chemistries (with details of peak discharge rate in MW) to be installed to service the development. For batteries and diesel storage, the EIS must also demonstrate the development would comply with the following standards:***
    - ***AS/NZS 4681 - Storage and handling of Class 9 (miscellaneous) dangerous goods and articles***
    - ***AS IEC 62619 - Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and batteries, for use in industrial applications***
    - ***FM Global Property Loss Prevention Data Sheet 05-32 - Data Centres and Related Facilities***
    - ***AS 1940 - Storage and handling of flammable and combustible liquids.***

SRL Consulting have prepared a SEPP 33 Preliminary Risk Screening Assessment, which forms part of **Appendix 18** of this EIS. The purpose of the SEPP 33 Report is to provide a screening assessment of the hazards associated with the storage of dangerous goods on the site in accordance with SEPP 33. The purpose of the initial SEPP 33 risk screening is to exclude from more detailed studies those developments which do not pose significant risk.

Where SEPP 33 identifies a development as potentially hazardous and/or offensive, developments are required to undertake a PHA to determine the level of risk to people, property and the environment at the proposed location and in the presence of controls.

If the risk levels exceed the criteria of acceptability and/or if the controls are assessed as inadequate, or unable to be readily controlled, then the development is classified as 'hazardous industry'. Where it is unable to prevent offensive impacts on the surrounding land users, the development is classified as 'offensive industry'.

A development may also be considered potentially hazardous with respect to the transport of dangerous goods. A proposed development may be potentially hazardous if the number of generated traffic movements (for significant quantities of hazardous materials entering or leaving the site) is above the cumulative annual or peak weekly vehicle movements. *Applying SEPP 33: Hazardous and Offensive Development Application Guidelines* (NSW Department of Planning, 2011), outlines the screening thresholds for transportation.

This SEPP 33 Report presents information pertaining to the presence of any hazardous materials, flammable substances, and compressed or liquefied gases proposed to be stored or handled in relation to the proposed development site, including on site storage, or transported to or from the site.

The MDC facility will cater for the storage of data, essentially large halls with server racks. There will be no processing related to this facility, other than electronic storage of data.

No DGs will be required for the operation of the site.

The only potentially hazardous material associated with the facility will be diesel fuel for the back-up generators. The total generators for the site will be 34, situated both the existing IC2 and IC3e (16 generators) and proposed IC3w (18 generators). The fuel on the site is made up of the bulk fuel capacity plus the capacity in the generator day tanks for both the existing IC2 and proposed IC3w. The total site bulk fuel storage is 638,400 L.

Diesel fuel storage shall be limited to generator day tanks and the bulk fuel storage systems. The breakdown of this storage requirements has been set out in **TABLE 16**.

As outlined in **TABLE 30**, testing of generators is proposed to be conducted for 60 minutes between 9:00 am to 4:00 pm, Monday to Friday. No more than five (5) generators will be tested per day and the five generators will not necessarily be tested concurrently, noting that in previous discussions with the EPA on annual operating hours of diesel generators, they have indicated that time spent testing more than one generator concurrently will be counted once, i.e. not hours multiplied by number of generators running. The total test time for all generators (existing and proposed) is therefore estimated to be 132 hours or less per year.

In order to assess the worst-case scenario, the modelling undertaken for the operational scenario conservatively assumes that:

- Each generator would be tested for a period of 60 minutes.
- Five generators will be tested concurrently within the same hour.
- Testing of generators is conducted every hour of the year between 9:00 am and 5:00 pm, i.e. one additional hour.

As demonstrated within **Section 4.3.8** of this EIS, there are no DGs to be used or stored at the facility and therefore the facility is not considered potentially hazardous with regards to DGs in accordance with the thresholds pertaining to SEPP 33.

Diesel fuel to be stored on site, is not classed as a DGs, but is classed as a C1 Combustible Liquid provided no flammable liquids are stored with the diesel.

Under the POEO Act, Schedule 1, Clause 9(1) 'petroleum products storage', which would include diesel fuel storage, is a Scheduled Activity. Capacity to store greater than 2,000 tonnes requires an environment protection licence from the NSW EPA.

Under the proposed development the total site storage capacity at 540 tonnes is not expected to require an EPL. The volume of diesel fuel storage exceeds the manifest quantities for C1 combustible liquids specified in schedule 11 of the *Work Health and Safety Regulation 2017*. Therefore, Safework NSW must be notified, which will include manifests and lodgement an emergency plan to Fire and Rescue NSW.

Lithium-ion batteries are Class 9 Miscellaneous dangerous substances and articles, which are excluded from the SEPP 33 screening process. However the estimated quantity exceeds the Safework NSW manifest quantity. Therefore, Safework NSW must be notified.

Hazards associated with these lithium-ion batteries related to fires are covered in the separate Fire Safety Strategy Report, prepared by Innova Fire Safety Specialists, and append within **Appendix 19** of this EIS.

The Fire Safety Strategy Report determines the following suitable management measures for the proposed operations:

- Storage of combustible and flammable liquids shall be in accordance with Australian Standard AS 1940 Flammable Liquids Storage and Handling.
- An emergency management plan (EMP) shall be prepared in accordance with AS 3745:2010. The EMP shall incorporating first attack firefighting training for the Emergency Planning Committee and Emergency Control Organisation members and emergency procedures which reinforce containment of fires only where safe to do so.
- The Data Halls and Roof are to be provided with a form of access control that monitors and records unauthorised access during normal operating conditions. Entry of authorised occupants shall be recorded. This may be in the form of an entry permit system, or a door access log recorded from proximity or smart cards in lieu of keys.
- The building is to be monitored by on-site security staff, that operate twenty-four (24) hours a day, seven (7) days a week. Note: The security booth is currently located at the entrance to the primary access, in the south-eastern corner to the site.
- Access into the site is controlled via a security gate, which requires access cards or arranged authorisation from security staff.
- The site is to be monitored by CCTV.
- The building's WHS systems are to include induction for personnel accessing the rooftop. The induction shall include details and information relating to:
    1. Emergency evacuation procedures which include:
        a. The location of the access/egress points; and
        b. The location of emergency equipment.
    2. The submission of Safe Work Method Statements or other activity-based risk assessments by personnel undertaking work on the rooftop.
- An Emergency Services Information Package and Tactical Fire Plans prepared in accordance with FRNSW Guideline Version 01 (dated 1 September 2017) are to be provided in the fire control centre.

The Fire Safety Strategy documented in this EIS has been developed with the intent of meeting the relevant Performance Requirements of the BCA. The Strategy has documented the general departures from the DtS Provisions of the BCA that are proposed to be satisfied by way of a Performance Solution and has identified the fire safety features that are required in order to achieve compliance with the relevant Performance Requirements.

Implementation of the fire safety strategy outlined in Fire Safety Strategy Report is considered to result in the building being able to comply with the BCA. Despite this it should be highlighted that this strategy is preliminary only and all parameters suggested herein are subject to consultation with stakeholders during the Fire Engineering Brief process, including the Fire & Rescue NSW.

Demonstration that the strategy will comply with the Performance Requirements will be the subject of a fire engineering assessment to be undertaken later, using fire safety engineering methodologies in accordance with the Australian Fire Engineering Guidelines.

Should the assessment reveal that the proposed systems do not satisfy the performance criteria, additional fire safety systems or modifications to the trial design followed by further assessment would be required

6.1.9 Infrastructure requirements

This section of the EIS assesses the infrastructure requirements associated with the proposed development, in particular the following matters requested by the SEARS:

- ***in consultation with relevant service providers:***
    - ***an assessment of the impacts of the development on existing utility infrastructure and service provider assets surrounding the site***

- ***identification of any infrastructure upgrades required on-site and off-site to facilitate the development and any arrangements to ensure that the upgrades will be implemented on time and be maintained***
- ***development of an infrastructure delivery and staging plan, including a description of how infrastructure requirements would be co-ordinated, funded and delivered to facilitate the development***

- ***in consultation with Council:***
  - ***a detailed description of all existing easements and/or stormwater infrastructure affecting the site***
  - ***an assessment of the impacts of the development upon Council's existing and proposed on-site stormwater infrastructure, including a detailed description of how the development has been designed to avoid and/or minimise potential impacts.***

In response to the abovementioned infrastructure requirements, a robust Infrastructure Assessment Report has been prepared by HDR, forming **Appendix 20** of this EIS. The Infrastructure Assessment Report outlines the incoming services required, with respect to capacity, availability and connections to facilitate the proposed development.

This subsection provides an overview of the incoming infrastructure services required, with respect to capacity, availability and connections to facilitate the development.

6.1.9.1 Existing infrastructure and services

Electricity:

The site is currently supplied by existing site feeders installed under earlier phases within the development.

Under the IC3w proposed development there is a requirement for future dual 33kV feeders, MDC have entered into an agreement with Ausgrid around the new feeder expansion as part of future fit out works of IC3w.

The above existing and future feeders serving the site are suitability sized to cater for the existing and proposed buildings on site.

Telecommunications:

The site currently has dual diversely routed underground pathways for telecommunications cabling from street pits in Talavera Road to the IC2 Telco Rooms and to serve the IC3e Data Centre. The external pit and pipe system will be extended to serve IC3w.

It is anticipated that carrier services will be organised directly by MDC. DBYD plans indicate that here are multiple telecommunication services providers in the vicinities of the site.

Potable water:

The existing Sydney Water portable supply is suitable to supply the combined water and wet fire services demand across the entire site.

The required flow rate for the site is 39 L/s and the Pressure and Flow Enquiry conducted in previous stages indicates that the street flow rate is capable of delivering 50 L/s. A new Pressure and Flow Enquiry is being conducted as part of detail design with existing pressure and flow information provided as part of the Infrastructure Report, prepared by HRD, within **Appendix 20** of this EIS. .

With the indicated flow rate of 39 L/s it is anticipated that tanks and pumps will be required to meet uptime and tenant requirements.

A Sydney Water Feasibility application has been submitted to Sydney Water on 24 September 2021 to confirm Sydney Water's Infrastructure can cater for the new proposed potable water demands.

Sewerage:

This site is serviced via an existing 300 mm Sydney Water Sewer, and Sydney Water has confirmed that the existing main is suitable to serve the new IC3w works.

The 300 mm diameter sewer main traversing through the site is currently concrete encased. Sydney Water have advised that the existing main is suitable and a new cut in has been designed near the IC3w southern elevation – based of previous IC3 demands.

A Sydney Water Feasibility application has been submitted to Sydney Water on 24 September 2021 to confirm Sydney Water's Infrastructure can cater for the new proposed waste demands.

Stormwater:

A 3.5 m wide stormwater easement (containing existing Ø1800 below ground pipe) is present draining from the south to the north of the site, connecting into existing Council drainage within Talavera Road to the north. Development works from LDA2018/322 have extended a new building at high level over a portion of the 3.5 m wide drainage easement. A 4.5 m wide easement for drainage has been provided to allow for drainage augmentation works if desired by Council in the future.

An overland flow path traverses the site, utilizing the internal road and carparking areas to flow through the site. Overland flow enters the site at the southeast corner travels in a westerly direction along an internal road, then utilizes the carpark on the western side to flow through to Talavera Road.

Existing Ø1800 Trunk Drainage Line

Council's trunk drainage system comprising of a Ø1800 concrete pipeline traverses the site draining from the southern boundary to the northern boundary. The pipeline is located within 3.5 m wide easement for drainage benefitting Council. The depth to pipeline invert ranges from 4.356 m near the southern boundary to 5.97 m at the embankment near the northern boundary. Under LDA2018/322, the building is elevated such that the easement and pipeline is in an under-croft area.

The proposed building structure has been orientated such that no structural elements (typically, piers, footings or columns) are located with the 3.5 m wide easement for drainage. Consideration has also been given to a "zone of influence" around the pipeline. The zone of influence being a zone where building structural elements do not impose any vertical or horizontal load to the ground, which subsequently are applied to the pipeline. This achieved by either locating structural elements outside of the zone of influence or extending piles through the zone of influence such that they transfer any loads to beneath this zone.

An access corridor has been provided through the under-croft area to facilitate future maintenance or reconstruction operations. The corridor provides a minimum clearance height above of 10 m but generally the clearance height is 12.5 m. The corridor has a varying horizontal width, allow machine access for maintenance or reconstruction operations.

Existing Drainage Easements benefitting adjacent properties to the East and West

Easements for drainage benefitting properties to the east and west of the site are located within the service road at the southern end of the proposed building. The proposed building does not encroach on these easements at its closest point the proposed building is 10.2 m away from the centreline of the easement. As such the building is well clear of the Ø675 pipeline and its zone of influence.

No adjustments to this pipeline or associated easements are proposed as part of the works.

4.5 m wide Easement for Drainage benefitting adjacent properties to the East and West

A 4.5 m wide for easement for drainage has been provided as part of development works under development consent LDA2018/322. Following pre-lodgement consultation with Council, this easement is sought to be relocated as part of the proposed IC3w development. Refer to **Section 6.1.9.2** below for further detail on the proposed easement realignment.

Overland flow:

An overland flow path exists within the site which conveys stormwater from an upstream catchment in Macquarie Park south of the site, through the site to Talavera Road.

This overland flow path is proposed to be retained but modified as part of the proposed works.

Northrop has conducted extensive flood modelling to determine flood extent and depths for the PMF and 1%AEP flood events. Northrop demonstrated that the IC3e building and subsequent modifications to surface gradings allow overland flow to pass through the site with appropriate freeboard during the 1%AEP and PMF events. Northrop also demonstrated that no adverse impacts would occur to other properties within the catchment. This outcome could be achieved due to provision of an under croft area such that flood waters could flow under the building.

This concept is being maintained for the IC3w development where the entire building is elevated above the floodway.

Addition of a 6 m wide internal access road along the western boundary will provide additional area for overland flow with the likely reducing flood depths and ultimately flood hazards across the site. A flood wall approximately 1.0 m high will be required along the western boundary to contain floodwaters within the site.

6.1.9.2 Infrastructure and servicing upgrades

Following the most recent meeting with Council officers on 21 October 2021, a summary of easement options has been developed to locate the easement and future infrastructure outside the proposed development footprint.

Figure 43 below demonstrates the possible alternate alignments.

Option 1 – follows the alignment of an easement for drainage, benefitting Council, which was created in response to a development consent condition of for LDA2018/0322. This alignment falls within the under-croft area of the proposed building. Council have stated that they are not supportive of this alignment, as such further options have been investigated.

Option 2 – realigns the easement to follow the north-western and south-western site boundaries, remaining wholly within the subject site, but outside the proposed development footprint. This is understood to be Council's preferred option. Feasibility of this option is still subject to review of impacts caused by existing in-ground services.

Other options that propose alternative alignments include **Option 3**, **Option 4A** and **Option 4B**, which were presented to Council.

Northrop have analysed that each option shows a similar flow capacity (or hydraulic performance) and do not cause changed flood behaviour.

The following benefits and constraints of each option were reviewed with Council.

TABLE 74: STORMWATER TRUNK MAIN OPTIONS

Option	Benefit	Constraint
1	▪ Shortest alignment path. ▪ Avoids realignment of Sydney Water Sewer. ▪ No disturbance to existing trees in northwest corner. ▪ Provides equivalent hydraulic performance when compared to Ø1800 pipeline.	▪ Alignment reliant on easements in private land. ▪ Part of alignment located in building under croft. ▪ Trench depths of up to 6m.
2	▪ Provides equivalent hydraulic performance when compared to Ø1800 pipeline.	▪ Requires removal of 171pprox.. 14 mature high value trees in northwest corner of site.

	▪ Pipeline located outside of building footprint.	▪ Adjustment of Sydney Water Sewer likely to be required. ▪ Trench depths of up to 6m. ▪ Alignment reliant on easements / access in private land.
3	▪ Allows a portion of the pipeline to be located within public roadways. ▪ Provides equivalent hydraulic performance when compared to Ø1800 pipeline. ▪ Pipeline located outside of building footprint.	▪ Requires removal of 172pprox.. 14 mature high value trees in northwest corner of site. ▪ Trench depths of up to 6m. ▪ Reliant on Road 1 being activated. ▪ Adjustment of Sydney Water Sewer required.
4A	▪ Allows a portion of the pipeline to be located within public roadways. ▪ Provides equivalent hydraulic performance when compared to Ø1800 pipeline. ▪ Pipeline located outside of building footprint. ▪ No disturbance to 14 existing trees in northwest corner.	▪ Trench depths of up to 6m. ▪ Reliant on Road 22 being activated. ▪ Adjustment of Sydney Water Sewer required.
4B	▪ Entire pipeline located within public roadways. (i.e., avoids easements in private land) ▪ Provides equivalent hydraulic performance when compared to Ø1800 pipeline. ▪ Pipeline located outside of building footprint. ▪ No disturbance to 14 existing trees in northwest corner.	▪ Trench depths of up to 6m. ▪ Reliant on Road 1 & 22 being activated. ▪ Adjustment of Sydney Water Sewer required.

Refer to **Figure 43** for the possible alternate alignments. It is noted ongoing engagement will be undertaken with Council on this matter to reach a formal agreed position.

In particular, and as mentioned within **Section 3.2.1.3** of this EIS, the proponent is continuing the consult with Council during the assessment process. The remaining matters for discussion revolve around the proposed realignment of future stormwater easement, as per **Section 6.1.9.2** of this EIS.

At the time of writing this EIS, it is expected that another meeting will be held with Council officers towards the end of November 2021, to discuss the planning and commercial aspects of the proposed stormwater easement realignment, which should then be resolved to present to NSW DPIE.

MDC is committed to reaching an equitable arrangement with Council, prior to the determination of this SSD Application.

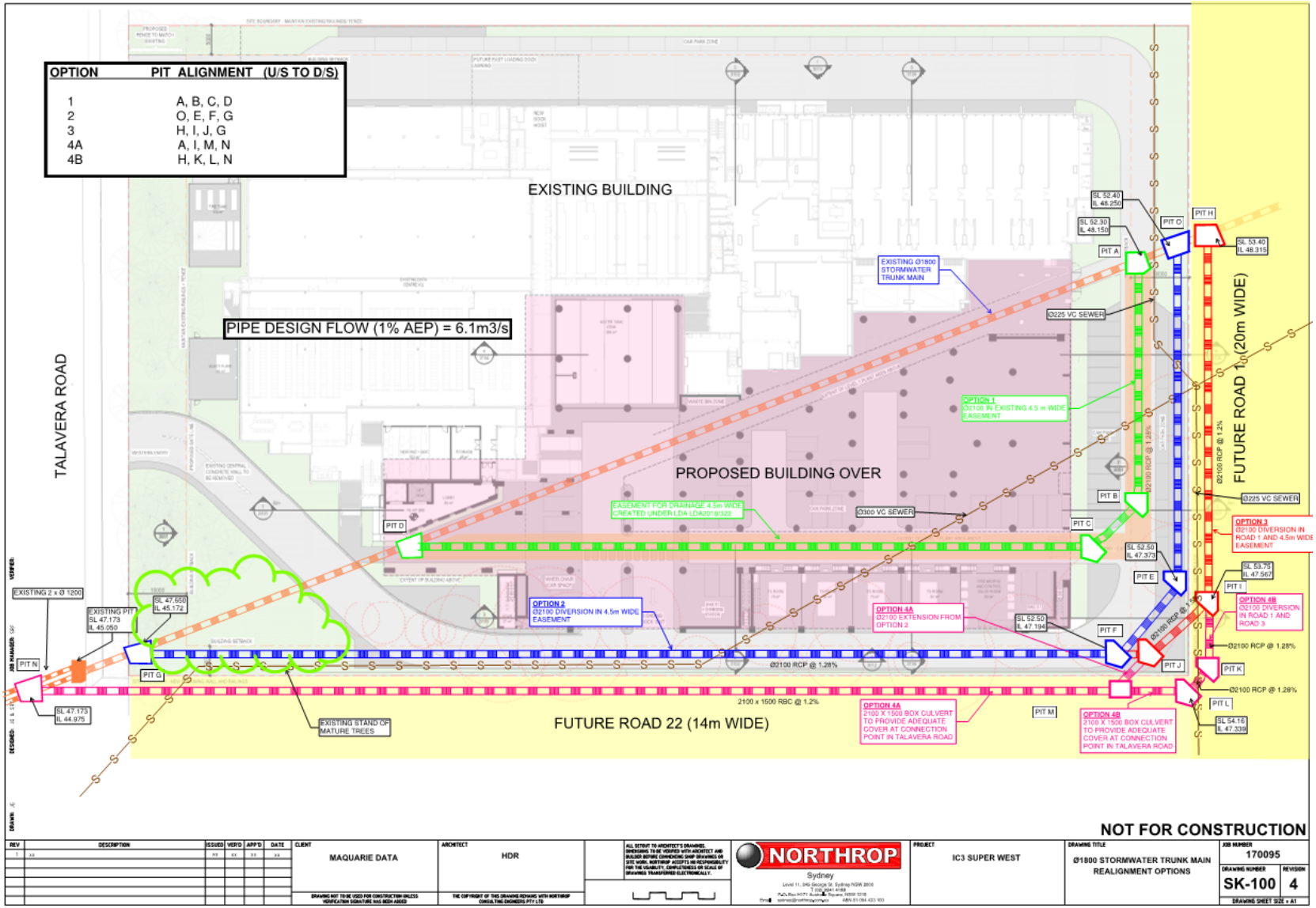


Figure 43 Stormwater Trunk Main Realignment Options (Source: Northrop, 2021)

6.1.10 Soils and water

This section of the EIS evaluates the soil and water aspects of the proposed development, as requested by the SEARs and addresses the following specific matters:

- ***an assessment of potential surface and groundwater impacts associated with the development, including potential impacts on nearby watercourses, riparian areas, groundwater, and groundwater-dependent communities;***
- ***a detailed overview of the development's anticipated water usage and intended water supply arrangements;***
- ***details of all existing and proposed surface, stormwater and wastewater management systems (including on-site detention and/or reuse), and an assessment of any associated water quality treatment options;***
- ***a description of the proposed measures to minimise water use and promote water sensitive urban design (WSUD);***
- ***a topographic assessment and justification demonstrating that any proposed earthworks are responsive and contextually appropriate;***
- ***characterisation of the nature and extent of any contamination on the site and surrounding area;***
- ***a description of the proposed erosion and sediment controls during construction.***

6.1.10.1 Assessment of surface and groundwater impacts

Within the subject site is an existing data centre, which is proposed to beexpanded upon. In addition to the existing data centre, the subject site includes planted vegetation in rows along its perimeters as well as landscaped areas around existing structures and the Talavera Road frontage in the north. The subject site is entirely surrounded by commercial facilities, that like the subject site, are surrounded by planted vegetation primarily in the form of trees. Available vegetation mapping (OEH 2016) does not identify any vegetation within the adjoining lots of the study area to conform to a native vegetation community.

Within the locality (5 km radius) of the study area exists Lane Cove National Park located approximately 600 m to the north and northeast at its closest point. Lane Cove National Park is an important conservation area within the locality that provides habitat for a number of threatened species and ecological communities; however, the subject site is separated from the National Park by significant artificial barriers including buildings (commercial and residential) and major roads including the M2, Talavera Road and Lane Cove Road.

The subject site is located within an urban environment and not located in close proximity to any water bodies and the project will have to meet relevant stormwater requirements. Therefore the project is considered unlikely to impact on water quality, water bodies or hydrological processes that would sustain threatened species and/or ecological communities.

6.1.10.2 Water usage and supply

The proposed development will utilise open circuit cooling towers for heat rejection. This cooling system is highly efficient, contributing to the low Power Usage Effectiveness (PUE) value, but will consume a significant volume of water. In order to minimise water consumption, the cooling towers will be selected and controlled as follows:

- Towers will be selected to provide no more than 0.002% drift coefficient
- The system will be controlled to operate with no less than 6 cycles of concentration

The above is in line with Green Building Council of Australia (GBCA) good practice for water efficiency and in accordance with AS/NZS3666.1 – Air Handling and Water Systems of buildings – Microbial Control. Water Usage Efficiency (WUE) is a measure of water efficiency for a data centre and can be defined at a high level as:

$$WUE = \frac{\text{Annual Site Water Usage}}{}$$

IT Equipment Energy

WUE, a site-based metric that is an assessment of the water used on-site for operation of the data center. This includes water used for humidification and water evaporated on-site for energy production or cooling of the data centre and its support systems (similar to carbon).

The lower the WUE the more water efficient a data centre is. However, it is important to consider WUE in the context of PUE, for example an air sourced cooling system would have a WUE of zero but could be less energy efficient resulting in a higher PUE.

The WUE has been calculated in accordance with "*The Green Grid, Water Usage Effectiveness (WUEtm): A green Grid Data Center Sustainability Metric*" to be 1.88 L/Kwhr.

There are no recognised WUE benchmarks or targets set as yet, and it is considered best current best practice for data centres to calculate and consider the WUE when designing a data centre. It is anticipated that the CNDCP are to confirm a WUE target in 2022.

The calculated annual water used on-site for operation of the new data centre is 528,113 m^3.

The total annual water usage for existing and new data centres (i.e., IC3E, IC3W and IC2) on site has been calculated as approximately 790,000 m^3.

All sanitary wares will achieve a minimum WELS – 5-star rating.

6.1.10.3 Water management and quality

Stormwater Quantity Management:

Requirement for OSD

The RDCP2014, Part 8.2 – Stormwater and Floodplain Management, provides guidance on the requirement for On-site detention for development within the City of Ryde. The proposed development is covered by this policy (applies to all land within the City of Ryde). Section 1.4.1 of the Stormwater Management Technical Manual details instances to which OSD does not apply, with specific reference to:

> *Condition (f) – It is demonstrated that the property is subject to significant inundation (say over 50%) inundation of the site due to a 100yr ARI storm event) or that is id impractical to provide an OSD storage facility out of or above this flow when the site is partially inundated OR OSD will not be required where the site of the development is located within a Council established 1 in 100 year ARI floodplain and that it can be demonstrated that lesser storm events will also flood the site. Otherwise it will be necessary to provide OSD to control the runoff for the minor storm events.*

Noting this, it has been inferred that OSD is not required for the development. The proposed development is located within the:

- Lower reaches of the Macquarie Park Catchment
- Extent of the 100yr ARI Flood event as described by the flood report prepared by Northrop

With this considered, following review of relevant peak flood levels associated with Industrial Creek within the development site and comparison with the site-specific stormwater outlet peak flow hydrograph (outlet EX01/07) – any inclusion of OSD on the site would:

- Negatively impact flood levels within the vicinity of the development, as well as;
- Reduce the ability of the proposed stormwater network to drain the sit effectively in a range of storm events.

Internal stormwater drainage system design

The proposed internal site drainage is designed to convey all runoff from the 20 year design ARI event via a below ground pit and pipe network inclusive of an existing OSD tank. All new proposed roof areas are to drain via internal and external pipework to new above ground OSD tanks and subsequently connect into the localised site stormwater network prior to discharging to Council's stormwater system. The proposed pit and pipe network drains the site to the existing council stormwater network on Talavera Road.
The development proposes to use existing site drainage infrastructure. This can be achieved as the new building generally extends over existing hardstand area. Thus the runoff from the new roof area is similar to it falling directly onto ground level paved areas.

To maintain consistency with the drainage system approved under LDA2018/0322 the same total roof area will be directed to OSD Tanks 1 and 2.

This is an area similar to the previously approved roof area and has been considered in the 12dmodel. The remainder of the roof runoff will bypass the existing OSD. It will be conveyed directly in to the existing stormwater network via a pit and pipe network. The external paved and landscaped area are also conveyed into the existing stormwater system via a proposed and existing pit and pipe network. A small area of the site (360 m^2) bypasses the proposed pit and piped network and will sheet flow into the adjacent Talavera Road.

Stormwater models for the proposed stormwater network have been produced in 12d 1D Dynamic Drainage Software (ILSAX) to determine the hydraulic performance of the post development network under a range of storms. Rainfall intensity duration and frequency data was adopted from the 2016version of Australian Rainfall and Runoff. The model adopts the following parameters:

- Paved (impervious) area depression storage = 1mm
- Supplementary area depression storage = 0mm
- Grassed (pervious) area depression storage = 5mm
- Soil Type = 3
- AMC = 3

The proposed internal site drainage is designed to convey all runoff from the 20 year design ARI event via a below ground pit and pipe network inclusive of an existing OSD tank. All new proposed roof areas are to drain via internal and external pipework to new above ground OSD tanks and subsequently connect into the localised site stormwater network prior to discharging to Council's stormwater system. The proposed pit and pipe network drains the site to the existing council stormwater network on Talavera Road.

The existing underground network is proposed to extend upstream to suit development works with new pits and pipes being constructed, while a portion of the network is to be removed. Water tanks are to be retained. The majority of the existing outdoor car parking catchment enters the internal stormwater network prior to entering an existing OSD tank which receives flow from the stormwater system along the south-west boundary of the site and the current roof catchment. All new roof areas will drain directly into a new OSD tanks and the existing roof area will drain to a water quality treatment chamber prior to discharging to an OSD tank.

Stormwater Quality Management:

City of Ryde requires a WSUD strategy to be submitted for land located in mixed use business zone or industrial zone with development area greater than 1,500 m^2. The RDCP2014 Section 8.2.3.3 WSUD Controls, specifies the pollutant load reductions required for stormwater runoff for the required new developments. These values are shown in **TABLE 75**

TABLE 75: CITY OF RYDE POLLUTANT LOAD REDUCTIONS	
Pollutant	**% Pollutant Reduction**
Gross pollutants	90 %
Total suspended solids	85 %

TABLE 75: CITY OF RYDE POLLUTANT LOAD REDUCTIONS	
Pollutant	**% Pollutant Reduction**
Total phosphorus	60 %
Total nitrogen	45 %

To achieve these targets a treatment train has been designed using MUSIC software for the site consisting of a few WSUD treatment measures to capture and retain pollutants. The treatment train consists of:

- Existing Ecosol Gross Pollutant Traps
- EviroPod 200 Pit inserts
- OceanProtect PSORB (MMC) Storm Filter Cartridges

Note – the system has been designed so the low flows at the splitter pit located at EX01/06 are directed to the Water Quality Chamber (containing PSORB StormFilter Cartridges) whilst high flows bypass this chamber. We note 400 m2of paved area and 1.050 m2of landscaped area bypasses theproposed treatment train however, this has been included within the MUSIC Model.

The results of the MUSIC model presented in **TABLE 76** demonstrate that the stormwater quality measures will achieve the water quality targets stated in the RDCP2014.

TABLE 76: WSUD MUSIC MODEL RESULTS					
Pollutant	**Source**	**Residual Load**	**% Reduction**	**Objective**	**Compliance**
Gross pollutants	308	9.29	97	90 %	Yes
Total suspended solids	1280	191	85.1	85 %	Yes
Total phosphorus	3.04	0.865	71.6	60 %	Yes
Total nitrogen	25.8	10.6	58.f8	45 %	Yes

6.1.10.4 Topographic analysis and earthworks

Minor earthworks are proposed as part of the development. The earthworks are required to allow formation of the overland flow path, such that it minimises the depth and spread of water and allow construction of the perimeter access driveway.

The earthworks beneath the building footprint range from a maximum of 0.25m cut to a maximum of0.25m of fill. One meter of filling is required to allow formation of the pad for the services platform on the western side of the building. Deeper cut operations are required adjacent to the southern and western boundary of up to 0.5m are proposed. Existing boundary levels will be maintained with the introduction low height retaining walls(up to 0.6m high will) partially along each boundary. Adjacent to the south west corner of the site, cut of up 1.25m is required to remove a landscape mound. The following earthworks volumes have been estimated.

- Cut: 799 m^3
- Fill: 1019 m^3
- Import: 220 m^3

We anticipate most of the imported material will be road base to allow formation of roads. Earthworks will occur under engineering supervision as the resultant surface will need to be suitable for future vehicle and building loads. An erosion and sediment control plan (refer Stormwater Management Report) will be implemented during earthworks to manage the impacts of erosion and sedimentation. Overall, the earthworks are minor and will result from some material being exported from site. Earthworks proposed generally lower the site levels to improve access and overland flow outcomes.

6.1.10.5 Contamination

A DSI Addendum has been prepared by ERM Services and appended within **Appendix 22**, to supplement the findings of a previous DSI issued by DLA Environmental Services in April 2018 (DLA, 2018). The DSI Addendum investigates and documents the potential contamination of the subject site, assesses the suitability of the site for the proposed use (or make recommendations to enable such a use to occur).

Based on the findings of their investigations, ERM Services have concluded the following:

- The site can be made suitable for the intended land use, consistent with 'Commercial / Industrial' as defined in the National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1) ('NEPM', NEPC, 2013), following the excavation, classification and disposal of asbestos impacted fill materials from location BH207_0.3 .
- If any unexpected finds of potentially contaminated material is uncovered during excavation, or material observed to be different to the material described in the DSI Addendum report is encountered, then these materials should be excavated separately and assessed by a contaminated land professional.

6.1.10.6 Erosion and sediment control

An erosion and sediment control plan has been prepared for the proposed development. The works will be undertaken in areas where extensive hardstand pavement is already in place. Extensive excavation of the site is not required to achieve site levels. Excavation is generally limited to the southwest corner where excavation depth ranges from200 to 600mm.The erosion and sediment control plan considers these conditions and consists of system of downstream sediment fences, wire mesh and gravel inlet filters and drop inlet sediment traps to prevent sediment entering the stormwater drainage system. Erosion is also prevented by the existing pavements on site that will remain in place for the duration of construction. The erosion and sediment control plan is presented within **Appendix 13** of this EIS.

6.1.11 Flood risk

This section of the EIS assesses the potential flood risk of the subject site and its proposed development, in response to the SEARs, specifically:

- ***identification of any flood risk on-site having regard to adopted flood studies, the potential effects of climate change, and any relevant provisions of the NSW Floodplain Development Manual (DIPNR, 2005)***
- ***an assessment of the impacts of the development, including any changes to flood risk on-site or off-site (including the existing overland flow route), and detail design solutions and operational procedures to mitigate flood risk where required.***

A Flood Assessment has been prepared by Northrop to inform a response to the potential flood risk items raised within the SEARs. The complete Flood Assessment forms **Appendix 26** of this EIS.

A flood investigation has been performed for the subject site for the purposes of a previous DA (LDA 2018/0322). The previous flood investigation was prepared by Northrop and titled:

> *"17-23 Talavera Road, Macquarie Park – Updates to Previously Submitted Flood Impact Assessment" dated the 28th of June 2019, herein referred to as the "Previous DA Investigation (Northrop, 2019)".*

The modelling prepared as part of the previous DA investigation (Northrop, 2019) has been used as the basis for this investigation. The correspondence presented herein presents any updates to the previously approved modelling. This correspondence should be read in conjunction with the previous Flood Impact Assessments contained within **Appendix 26** of this EIS.

6.1.11.1 Identified flood risk

Existing case:

During the existing case, overland flow enters the subject site from the southern corner, where flood water initially divides between entering the subject site and filling up the flood storage area located within the property adjacent to the south-eastern boundary.

Once this flood storage area is filled, additional flows are forced onto the subject site via a low point near the southern corner.

Once flows enter the subject site they continue overland in a north-westerly then north-easterly direction, over the existing driveway and carpark, before discharging to Talavera Road in the northern corner of the subject site.

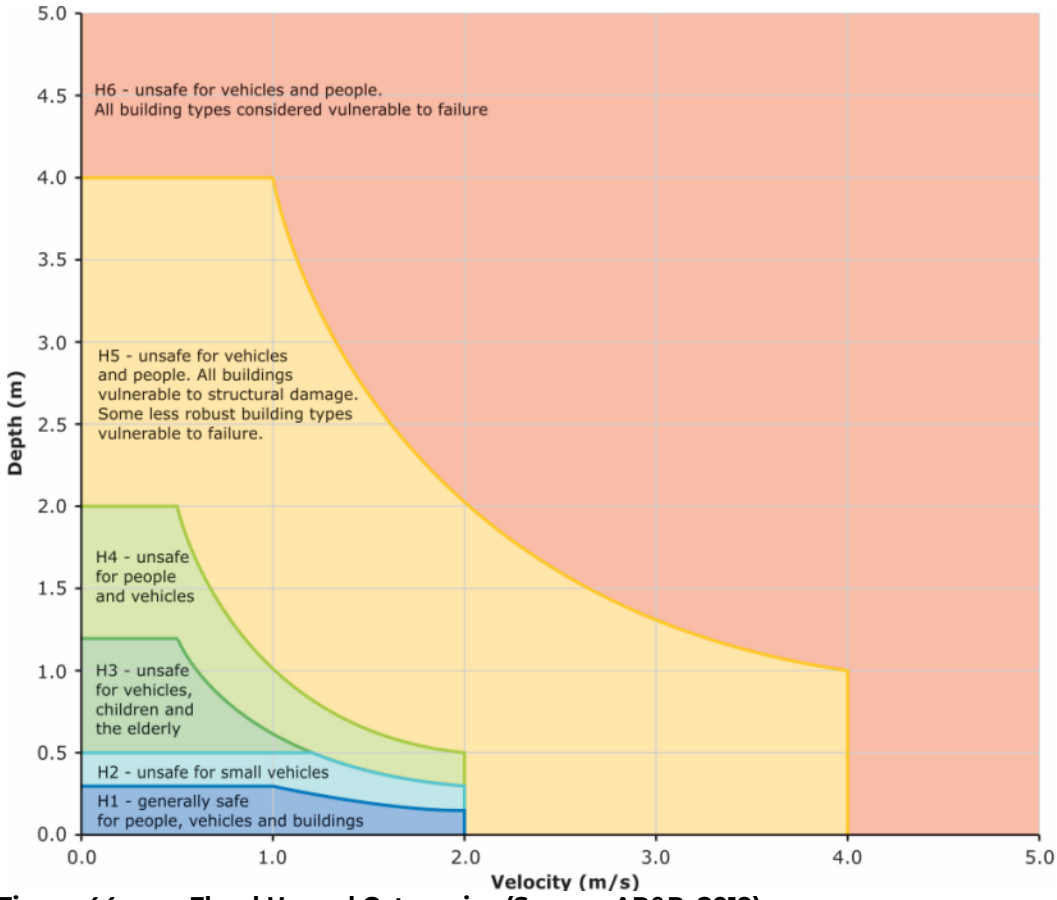


Figure 44 Flood Hazard Categories (Source: AR&R, 2019)

The 1% AEP and PMF flood depth and elevation contours are presented in the **Figure 45** and **Figure 47** respectively. Flood depths across the subject site during the 1% AEP range from approximately, 0.1 - 0.3m in the driveway and carpark adjacent to the south-western and north-western boundaries while the driveway along the south-eastern boundary remains largely flood free. Similarly, flood depths during the PMF design storm events range from approximately 0.1 - 0.5m in the driveway and carpark along the south-western and north-western boundaries while depths in excess of 1.0m are observed along the south-eastern boundary.

Flood elevations in the property adjacent to the south-eastern boundary are shown in **Figure 45** and **Figure 47** as 52.78m AHD and 53.21m AHD during the 1% AEP and PMF design storm events respectively. Similarly, flood levels along the south-western boundary during the 1% AEP and PMF design storm events range from 52.77m AHD to 53.09m AHD during the 1% AEP and PMF design storm events respectively. Flood elevations at the existing IC2 Loading Dock (FFL of ~52.5m AHD) during the 1% AEP and PMF are 51.99m AHD and 52.21m AHD respectively.

Flood hazard has also been considered for the existing and developed scenarios using the latest AR&R 2016 hazard categories. A summary of these categories is presented in **Figure 44**.

Figure 46 shows the existing flood hazard in the driveway during the 1% AEP is largely H1 with a patch of H2 along the south-western boundary. During the PMF, **Figure 48** shows H5 hazard flow at the southern corner and along the south-eastern side of the building. A maximum of H4 is observed in the driveway and carpark along the north-western boundary which increases to H5 as flows continue down the driveway towards Talavera Road at the northern corner of the subject site.

Developed case:

Flow behaviour during the developed case remains largely un-changed when compared to the existing case. Flows enter the subject site from the southern corner and continue overland in a north-westerly then north-easterly direction over the existing driveway and carpark before discharging to Talavera Road in the northern corner of the subject site.

Adjustments have been made to the design surface within the under-croft area and adjacent to existing IC2 loading dock, in an attempt to reduce the flood hazard conditions in the driveway and carpark and lower the flood levels around the loading dock.

Figure 49 and **Figure 51** show the 1% AEP and PMF flood depths and elevation for the developed case. The results show no change in flood elevations in the property adjacent to the south-eastern boundary and adjacent to the southern corner of the site. A reduction in flood depth is observed at the existing IC2 loading dock with a flood level of 51.90m AHD during the 1% AEP (reduced from 51.99m AHD) and 52.16m AHD (reduced from 52.21m AHD) during the PMF.

Figure 50 and **Figure 52** shows flood hazard along the south-eastern driveway remains largely unchanged when compared to the existing case however, flood hazard conditions along the north-western boundary have been improved with largely H1 and H2 observed in the under-croft area during the 1% AEP and PMF design storm events respectively (reduced from H4 in the PMF during the existing case).

Hazard conditions in Talavera Road, adjacent to the subject site during the 1% AEP design storm event is largely H1, increasing to H3 in the sag located adjacent to the northern corner of the site. Some small patches of H5 are also evident which is expected to be due to patches of high velocity. If required, access and egress from the subject site may be possible during the 1% AEP via the access driveway in the eastern corner of the site.

Hazard conditions in Talavera Road during the PMF increase to H5 with patches of H6. It is expected that in a rare or extreme event such as the PMF, staff and visitors will evacuate prior to the event or seek refuge within the building until floodwaters subside. This is reflected in the Flood Emergency Response Plan prepared for the site as part of the previous DA (LDA2018/0322).

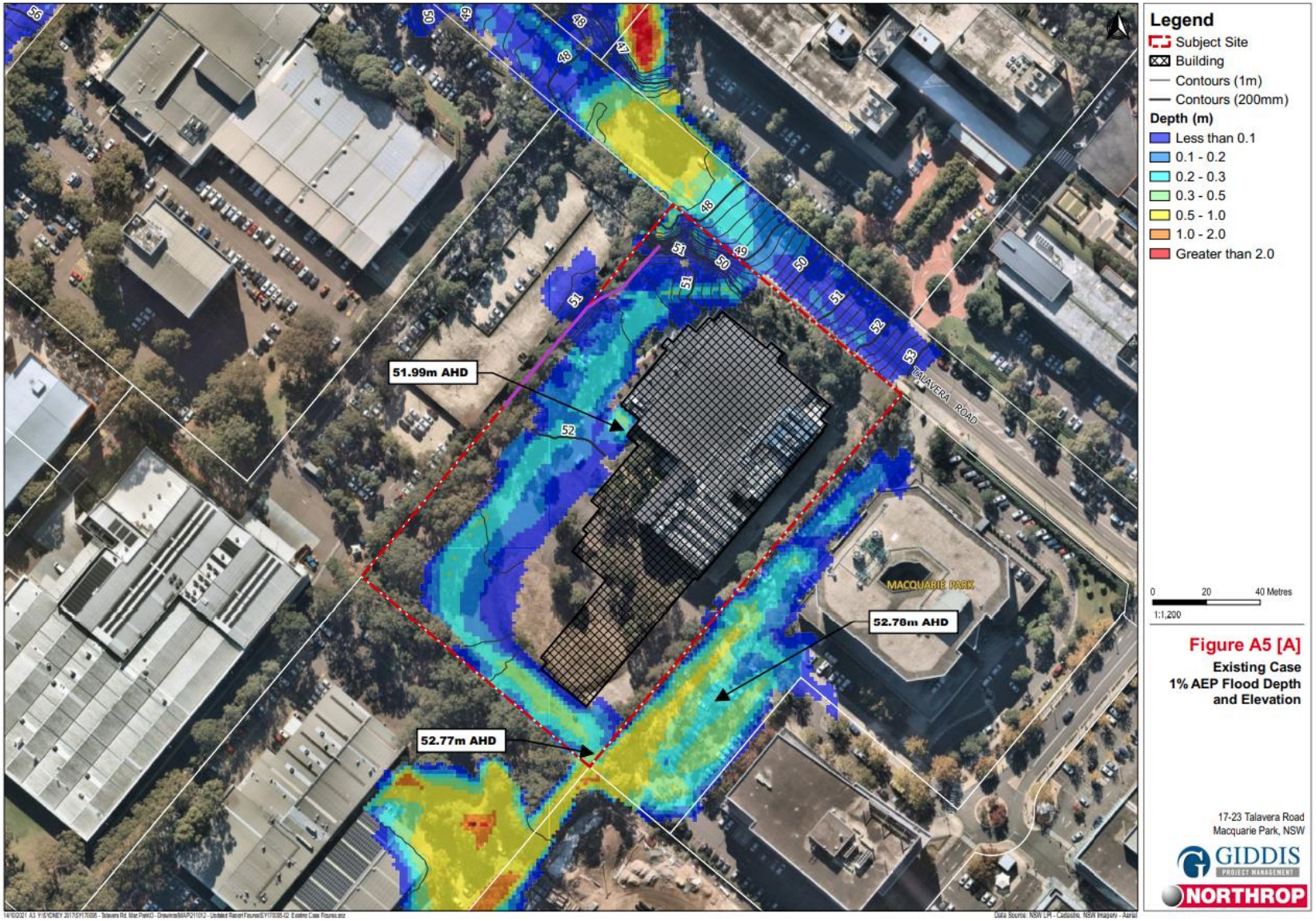


Figure 45 **Existing Case 1% AEP Flood Depth and Elevation (Source: Northrop, 2021)**

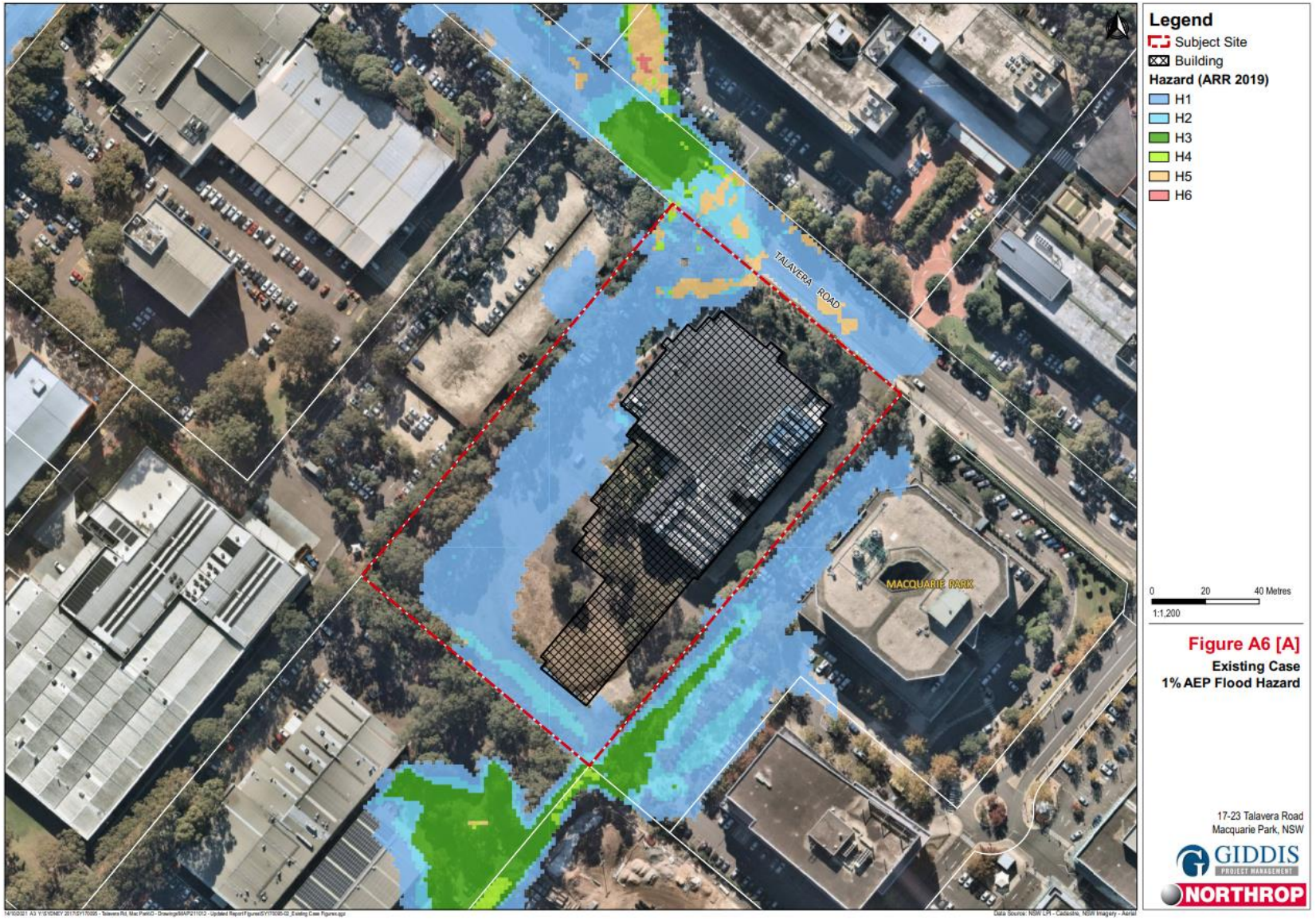


Figure 46 Existing Case 1% AEP Flood Hazard (Source: Northrop, 2021)

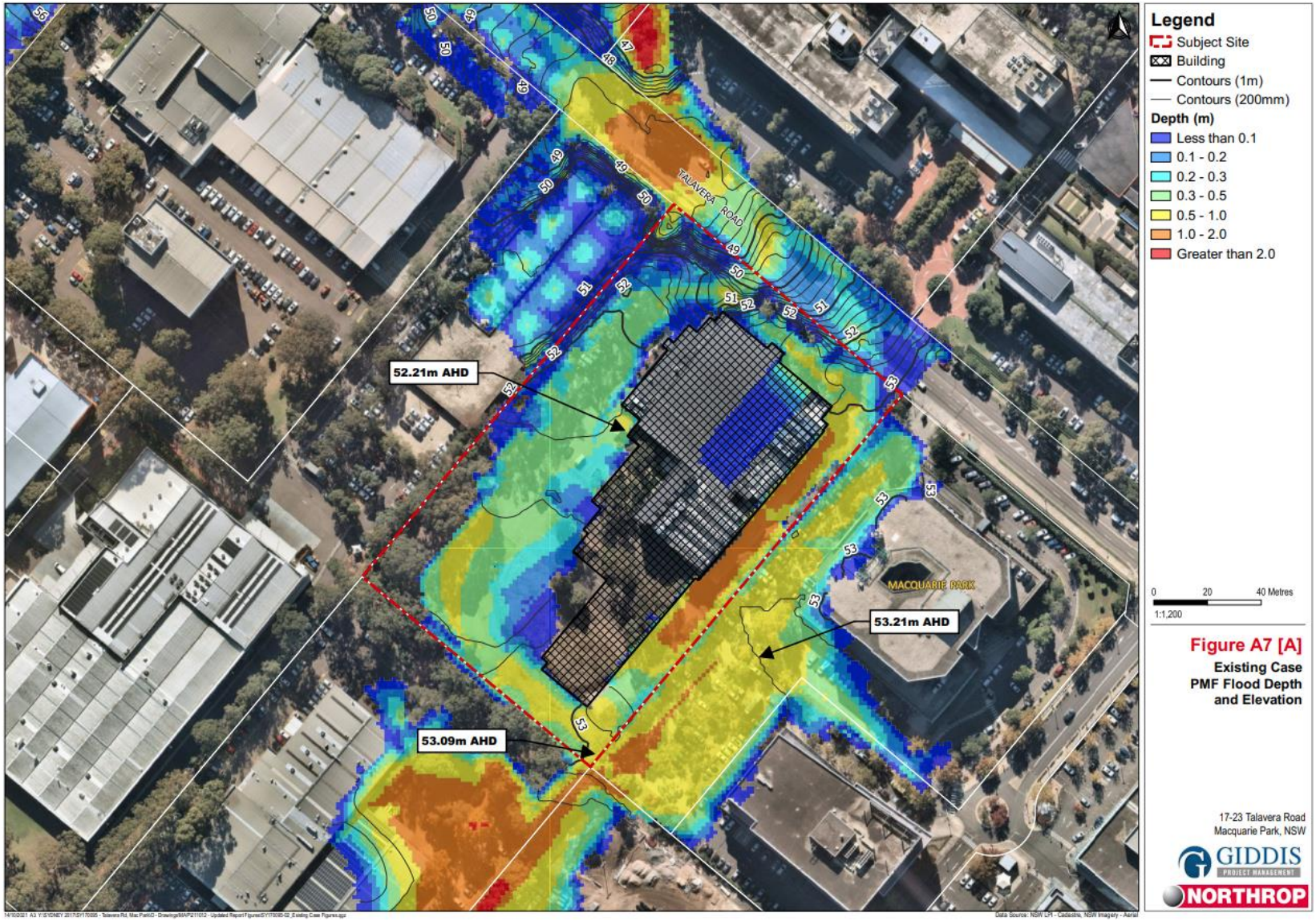


Figure 47 Existing Case PMF Flood Depth and Elevation (Source: Northrop, 2021)

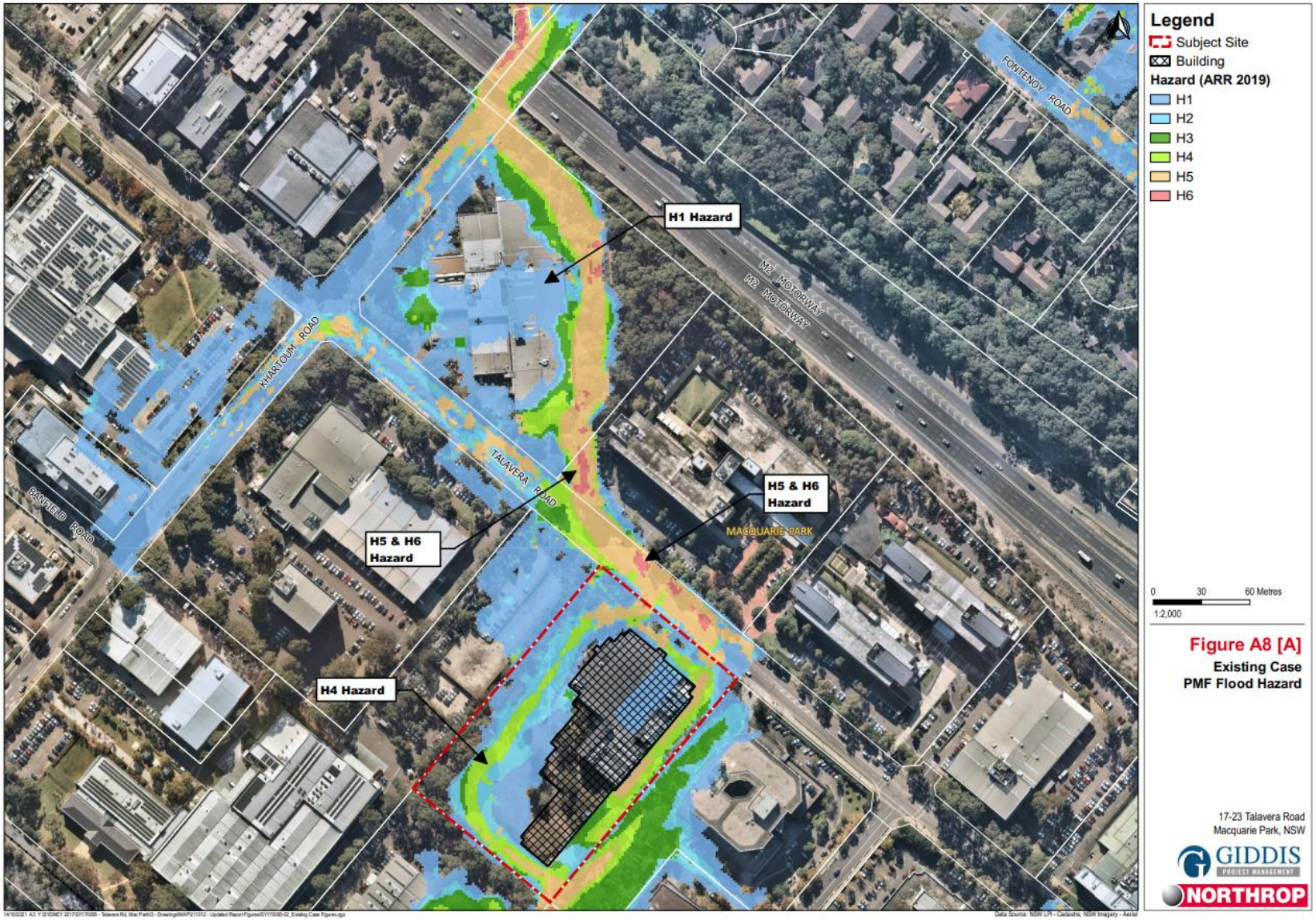


Figure 48 Existing Case PMF Flood Hazard (Source: Northrop, 2021)

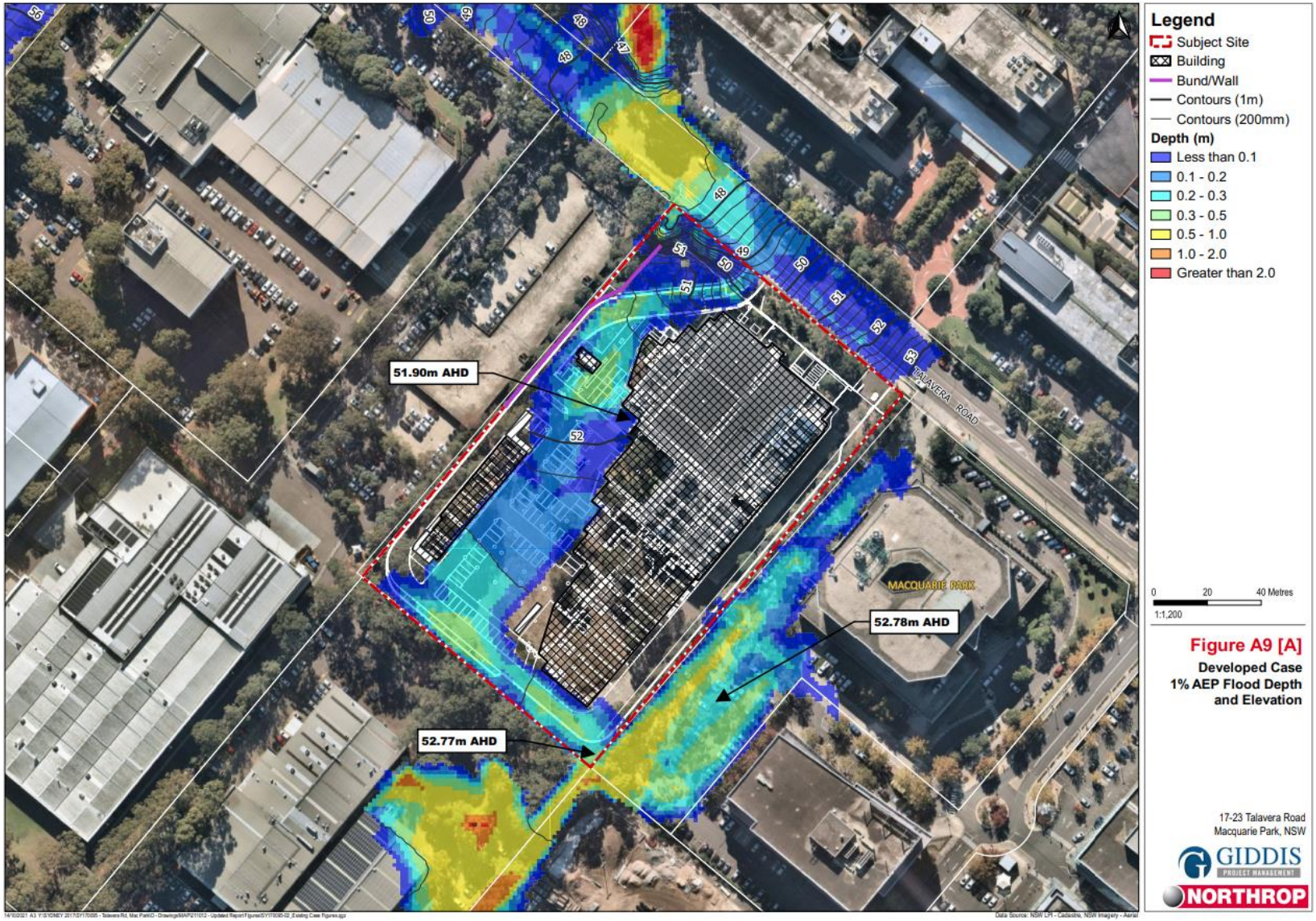


Figure 49 Developed Case 1% AEP Flood Depth and Elevation (Source: Northrop, 2021)

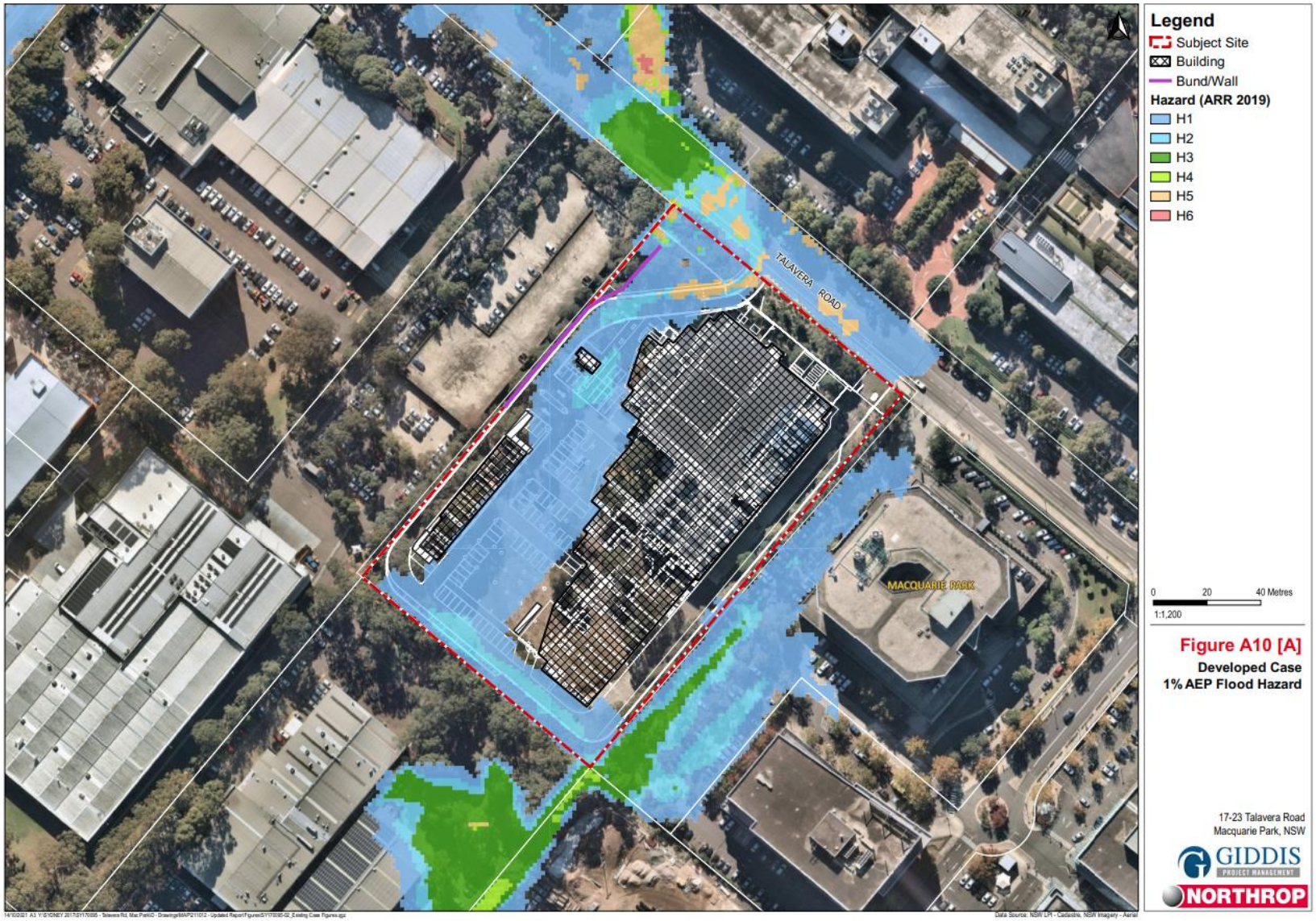


Figure 50 Developed Case 1% AEP Flood Hazard (Source: Northrop, 2021)

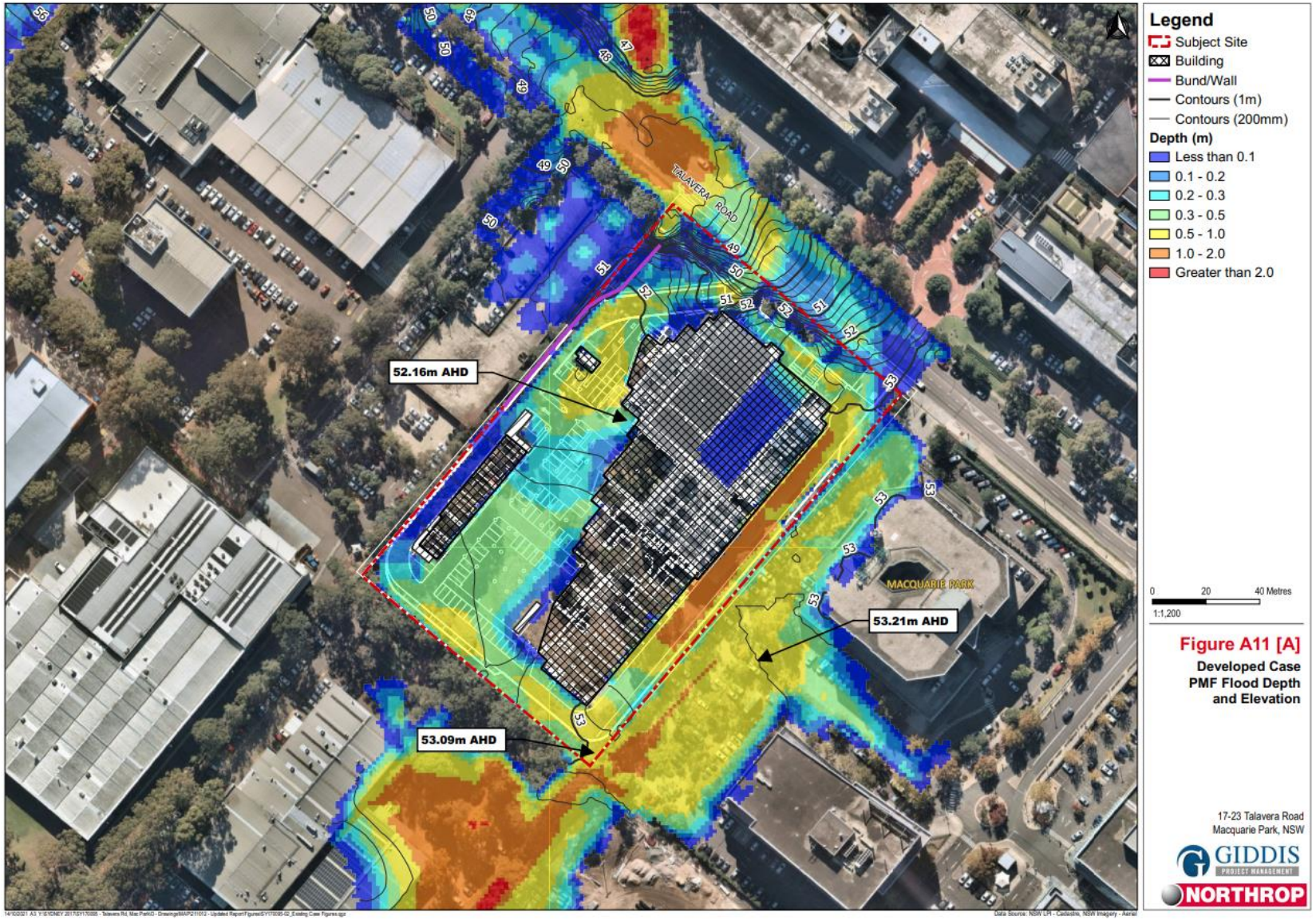


Figure 51 **Developed Case PMF Flood Depth and Elevation (Source: Northrop, 2021)**

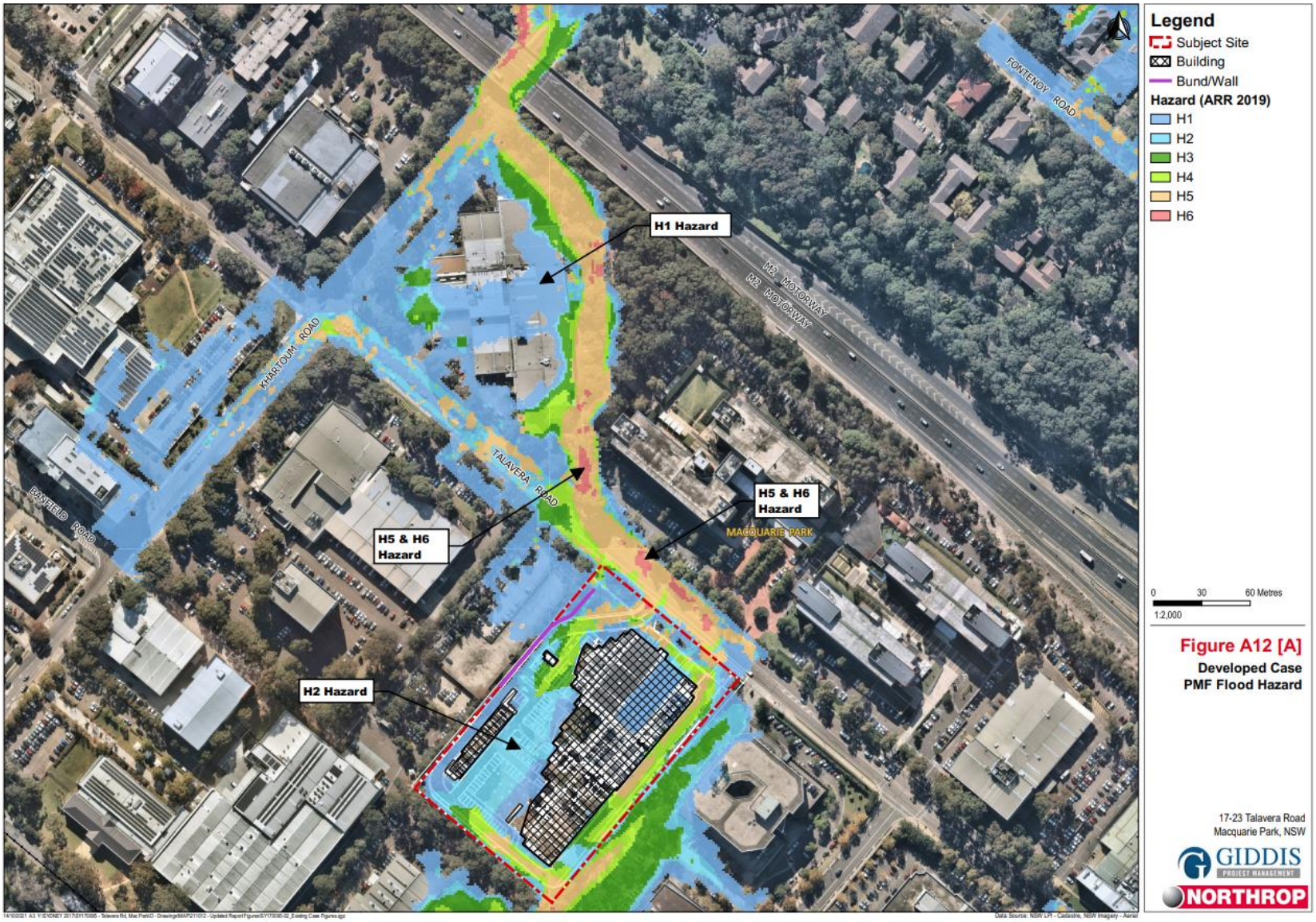


Figure 52 **Developed Case PMF Flood Hazard (Source: Northrop, 2021)**

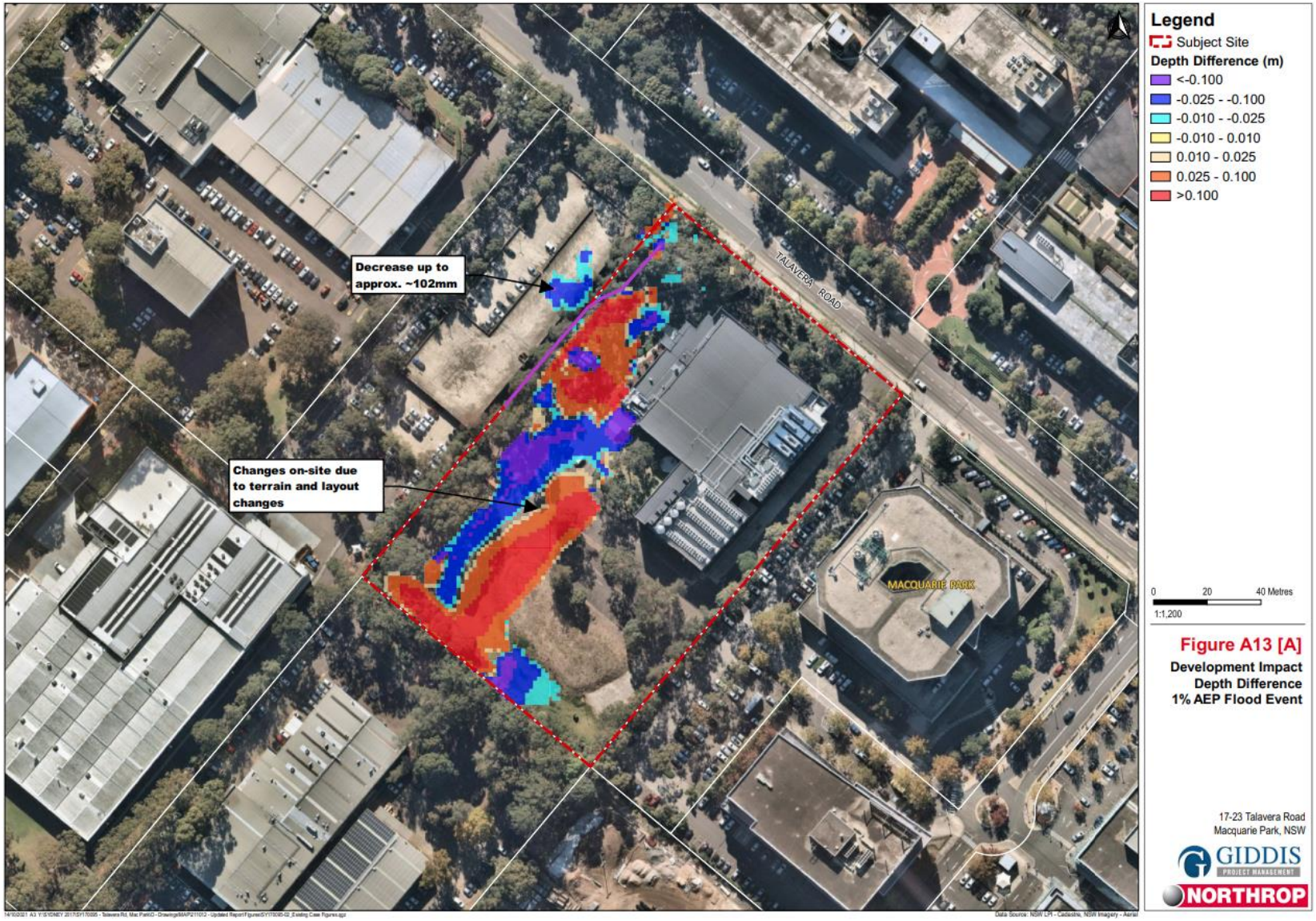


Figure 53 **Development Impact Depth Difference 1% AEP Flood Event (Source: Northrop, 2021)**

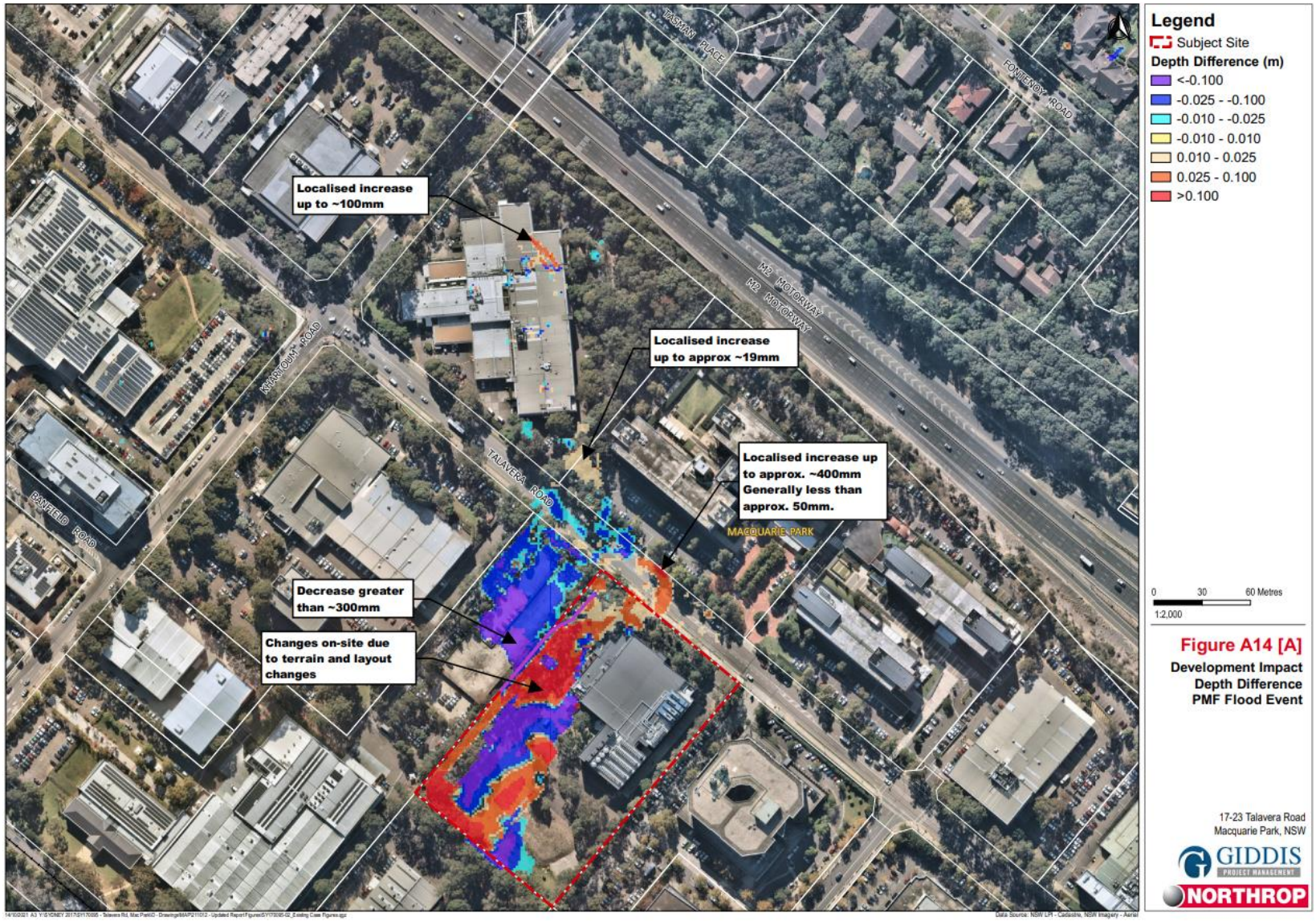


Figure 54 **Development Impact Depth Difference PMF Flood Event (Source: Northrop, 2021)**

Development impact:

The development impact on the existing 1% AEP and PMF design storm events is presented in **Figure 53** and **Figure 54**. **Figure 53** shows a decrease in flood depth of up to 102mm in the property adjacent to the north-western boundary, with this property now flood free during the 1% AEP. This is the result of updating the height of the bund in attempt to improve flood conditions in adjacent properties.

Figure 54 shows the flood impact during the PMF design storm event. Similar to the 1% AEP, a decrease in excess of 300mm is observed in the property adjacent to the north-western boundary as a result of the modified bund/ flood wall height.

A localised increase is observed in Talavera Road during the PMF with up to 400mm but generally less than 50mm observed. Comparing **Figure 48** and **Figure 52**, this increase is not expected to affect the trafficability in Talavera Road with H5 and H6 hazard conditions already observed in the area (i.e. the increase does not result in the introduction of a new hazard category).

Similarly, localised increases of up to approximately 19mm and 100mm are observed in 19-25 Khartoum Road, downstream of the subject site and Talavera Road. Similar to Talavera Road increases, these are localised and are expected to be the result of a slight change in the flow behaviour downstream of the subject site. **Figure 48** and **Figure 52** suggest only a minor change in the extent of the existing hazard may occur as a result, however these hazard conditions are already observed in the area.

Given the magnitude of the event and the negligible change in hazard conditions, the increases observed in Talavera Road and Khartoum Road are not expected to result in a significant adverse impact.

6.1.11.2 Flood planning levels

The proposed Electrical Plant and Fire Misting Control Valve room located in the eastern corner of the subject site are recommended to be placed at the 1% AEP + 500mm or the PMF (whichever is higher). The maximum flood level adjacent to this facility during the 1% AEP and PMF design storm events are 52.45m AHD and 52.70m AHD respectively. As such, a minimum Finished Floor Level (FFL) of 52.95m AHD (i.e. the 1% AEP + 500mm) is recommended.

No adverse impact to existing Flood Planning Levels is expected to the existing IC2 and IC3-East facilities. The southern portions of IC3-East are sited at a level of 53.66m AHD, reducing to 53.23m AHD at its interface with IC2 and the eastern corner of the facility (in IC2). Maximum flood levels of approximately 53.30m AHD are observed at the southern corner of the building, reducing to 53.21m AHD along the south-eastern side of the building and approximately 52.9m AHD at the eastern corner during the PMF.

Around the western side of the building, floor levels range from 53.66m AHD in the southern portion of the facility, reducing to 53.23m AHD at its interface with IC2. The lowest portion of the building is at the existing entrance and loading dock in IC2 with the FFL sited at approximately 52.5m AHD. **Figure 49** and **Figure 51** show flood levels are below these levels with a reduction in flood levels observed around the loading dock as a result of the proposed development.

6.1.12 Urban design and visual

This section of the EIS evaluates the urban design and visual aspects of the proposed development, in relation to the SEARs and addresses the following specific matters:

- ***demonstration of how the development will achieve design excellence in accordance with any relevant EPI provisions and the objectives for good design in Better Placed (GANSW, 2017);***
- ***a detailed design analysis of the proposed development with reference to the building form, height, setbacks, bulk and scale in the context of the immediate locality, the wider area and the desired future character of the area, including views, vistas, open space and the public domain;***
- ***a visual analysis of the development from key viewpoints, including photomontages or perspectives showing the proposed development;***

- ***where the visual analysis has identified the potential for significant visual impact, preparation of a visual impact assessment that addresses the impacts of the development on the existing catchment;***
- ***consideration of the layout and design of the development having regard to the surrounding vehicular, pedestrian and cycling networks (both existing and proposed);***
- ***an assessment of the solar orientation of the development and any potential overshadowing (this should be supported by shadow diagrams for all four seasons);***
- ***detailed plans showing suitable landscaping which incorporates endemic species;***
- ***consideration of how the development would maximise opportunities for green infrastructure, consistent with Greener Places (GANSW, 2020); and***
- ***an assessment of how the development complies with relevant accessibility requirements.***

6.1.12.1 Better Placed Design

In response to GANSW's Better Placed and Greener Places documents the proposed development is considered to be well designed, better connected and creates the best possible outcome for the local community.

The main objectives of Better Placed are addressed as follows:

1. Better Fit:
    - The siting of the building has been carefully considered to respect the surroundings, connect to existing thoroughfares and enable a positive outlook from the building.
    - By understanding the vegetation endemic to the surrounding area, trees, shrubs and groundcovers from these communities have been proposed to replace existing vegetation removed. This also helps in the mitigation of visual impacts for some visual receivers.
2. Better Performance:
    - The building has been designed to meet Section J Energy Efficiency under the NCC, +10%.
    - Utilising native and endemic species, while also proving low water-use landscape zones, the proposal the need for permanent irrigation to these areas.
    - The proposal provides urban tree canopy cover to combat heat island effects by replacing removed trees where possible.
    - Further tree planting has also been proposed along the Talavera Road frontage which will increase shade to the public domain.
3. Better for Community:
    - Increasing the capacity and capability of secure data storage and cloud-based infrastructure is of regional, state and national significance. The provision of data storage provides a platform for a competitive digital economy, with increased capacity creating the conditions for multinationals to enter the Australian market.
4. Better for People:
    - Comfort for occupants is of utmost importance for the Data Centre. Stringent thermal, acoustic and lighting requirements will be met to ensure a comfortable environment is provided.
    - Natural Light, oversight of vegetation and successful planning are all seen as key factors in the health and well being of staff and visitors.
5. Better Working:
    - The proposed development is an expansion to the existing data centre, co-located with an existing facility that is demonstrated to operate consistent with character of local area. The expansion would further support the secure operation of business to business and business to consumer services, helping provide employment-generating opportunities in the professional services, start-up and creative industries in the City of Ryde LGA.
6. Better Value:
    - The new building and its associated landscape will raise standards and quality to the Macquarie Park precinct. This will act as a catalyst for further investment and bring more businesses to the area.
7. Better Look and Feel:
    - The new building will be aesthetically pleasing and endure a sense of place.
    - Creating an identifiable entry with evergreen trees and layered planting.

- Creating a sense of place and identity for the data centre by planting a mix of native and exotic species. This will provide seasonal interest with the use of trees, flowering shrubs and groundcovers.

6.1.12.2 Design analysis

The design of the proposal, whilst differing in scale from the existing built form, will achieve an overall cohesive visual outcome. A sympathetic and considered palate of forms, articulation and materials will result in an overall "one building" outcome, with each building element respecting the other.

1. Adopt vertical emphasis already established on campus.
2. Emphasis placed on MDC brand through colour and materials palette adopted in the Stage 1 development to ensure a cohesive campus.
3. Showcase secure nature of the building as well as plant that highlight the technical prowess.

The diagrams below set out the thought process for the design development of Stage 2 of the proposed data hall expansion project:

1. The form of the development is fundamentally designed around the function of the data hall.
2. The mass is elevated to address site constraints including the overland flow requirements across the site.
3. Markers are pushed towards the southern and northern boundaries to act as markers along the major Talavera arterial route and proposed new road.
4. The tree bund along Talavera Road is maintained to keep the character of the site surrounds.

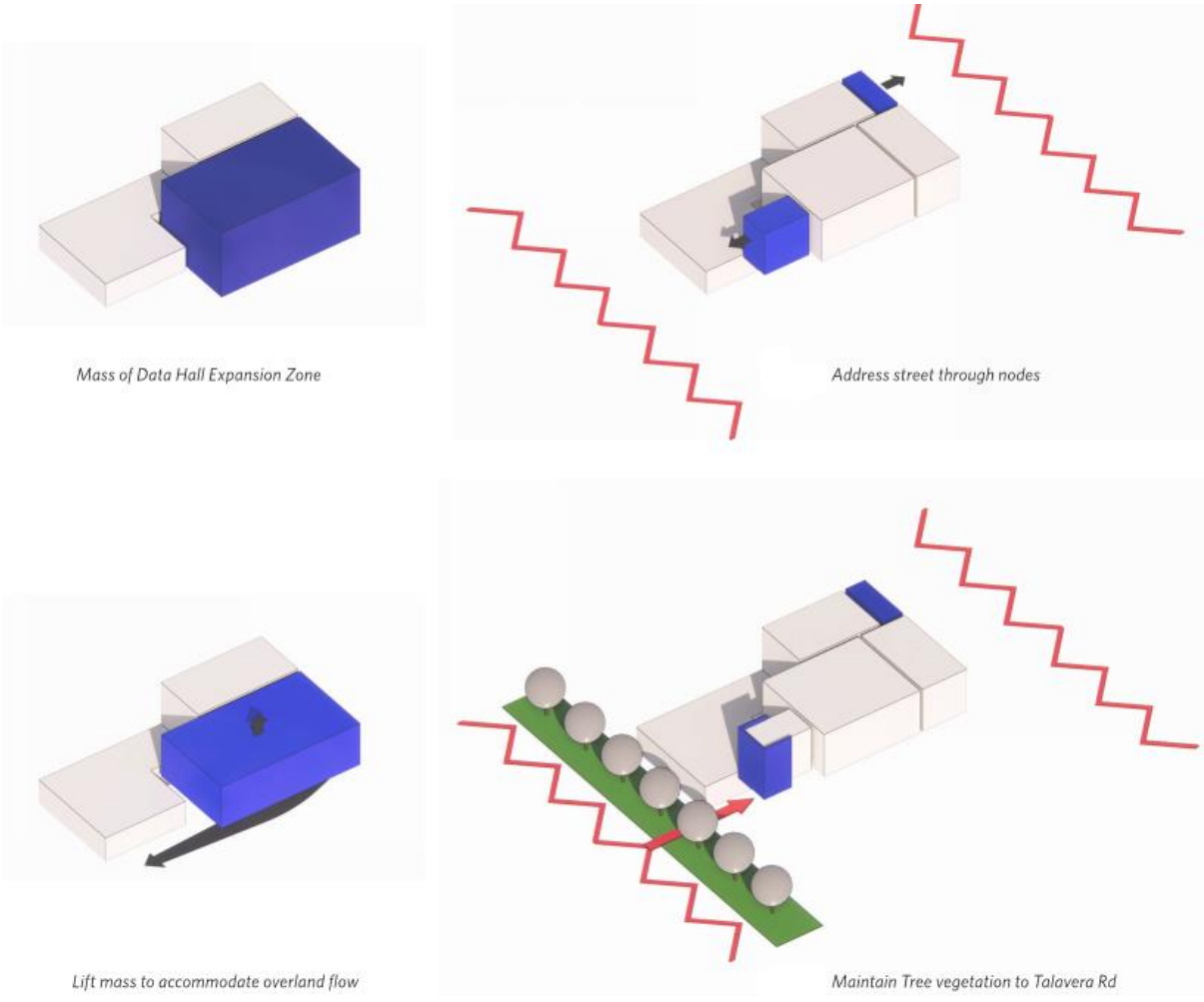


Figure 55 Development Design Thought Process (Source: HDR, 2021)

The proposed building (Stage 2) is sited towards the west of the campus. Two entrance points are maintained in their existing location and are connected by a perimeter road which acts as a service road for logistics, access to car parking and as a fire egress zone.

The floor plate has been designed to best practices of data centre design and to fit seamlessly with the existing Stage 1 building. Towards the Talavera Road boundary, the building has been purposely set back to allow a landscaped area to the entry point. This allows the proposed building to nestle into its surroundings and cohesively address the form and architecture of the existing building.

Key built form elements of the proposal are described within **Section 3.2.2** of this EIS.

6.1.12.3 Surrounding context

The subject site is situated within a highly urbanised area close to the commercial core of Macquarie Park. Talavera Road is home to a number of commercial offices, data centres and educational facilities. Typically these include onsite parking and landscaping. Development has increased significantly over the last decade, this includes the Chatswood to Epping Rail line in 2009 and more recently in 2019 the Sydney Metro Northwest Line currently running between Chatswood and Tallowong.

The surrounding area is characterised by commercial buildings and land uses consistent with the character of Macquarie Park as a business precinct. Large multi-storey commercial buildings within landscaped grounds are typical of the area, with on site parking provided.

Vegetation cover is typified by native and exotic canopy trees to streets and individual lots fronting roads. These are usually underplanted with a mono culture of native grasses and clipped shrubs such as Lomandra and Japanese Box. Some lots as seen in aerial maps contain open lawn or car park areas with large trees, shrubs and groundcovers surrounding the open spaces.

Other similar types of large scale, multi-level developments are located in the immediate context of the site including NEXT DC S1 and S2. It is clear from site and aerial analysis that the proposed extension to the facility is not out of character for the site or the surrounding area.

Comparable existing development within the surrounding area:

To the southeast of the MDC Data Centre is the NEXTDC Sydney Data Centre (S1) located at 4 Eden Drive, Macquarie Park. This was approved in 2011 (LDA2011/0413) and completed in 2013. It contains seven data halls within a five-storey building over a development area of 18,000m^2. This building is seen in drone photography **Figure 57** and **Figure 58**.

Shown in Figure 19 on page 21, the NEXTDC Sydney Data centre (S2) is located to the south of the site at 6-8 Giffnock Avenue, Macquarie Park. This was recently completed in 2019 and contains eight data halls within an eight-storey building. The upper limit of the building is RL101.9m which sits just below the DCP 45m height limit with some small roof elements protruding through it. The data centre is highly prominent within the immediate area and can be seen within the drone photographs **Figure 56** and **Figure 58**.

Comparable future development within the surrounding area:

In close proximity to the north at 11-17 Khartoum Road and 33-39 Talavera Road is the Stockland 'M_Park' site. This Concept Development (LDA 2017/0547) received approval from the Sydney North Planning Panel in December of 2019. A recent SSD was approved in May 2021, which proposed a data centre to the southern portion of the M_Park site. The development known as Macquarie Park Data centre (SSD-10467) is a five-storey building with a roof level RL of 93.6m, the parapet wall and lift overrun extend beyond this height, but the building still falls under the height limit of 45m. The M_Park masterplan is now undergoing an amendment to incorporate changes required to accommodate the approved data centre. Following construction this development and other development within the M Park site will likely block views of the MDC Data Centre for receptors within a viewing arc between due north and west of the development.

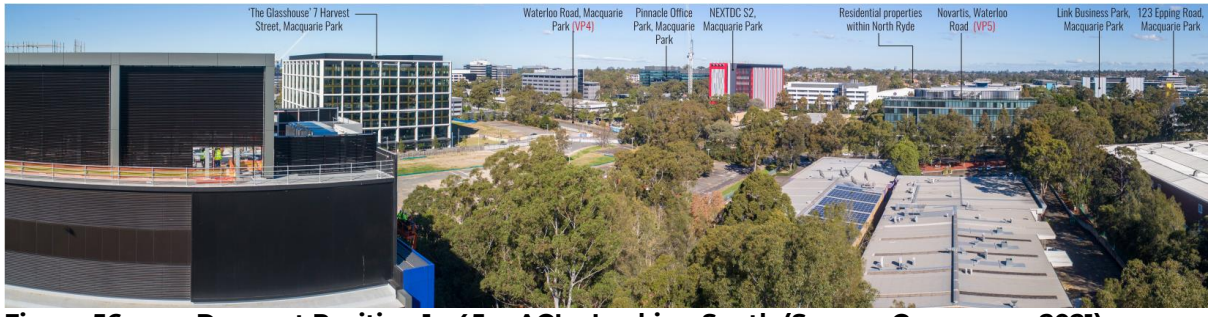


Figure 56 Drone at Position 1 - 45m AGL - Looking South (Source: Geoscapes, 2021)

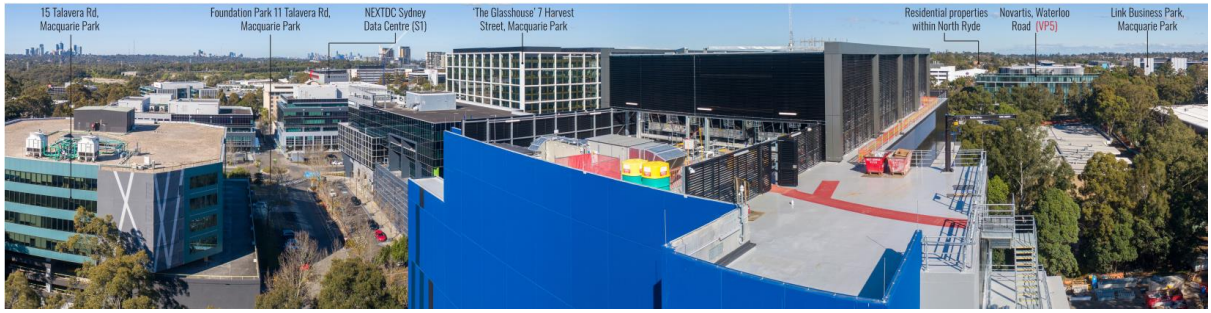


Figure 57 Drone at Position 2 - 45m AGL - Looking South (Source: Geoscapes, 2021)

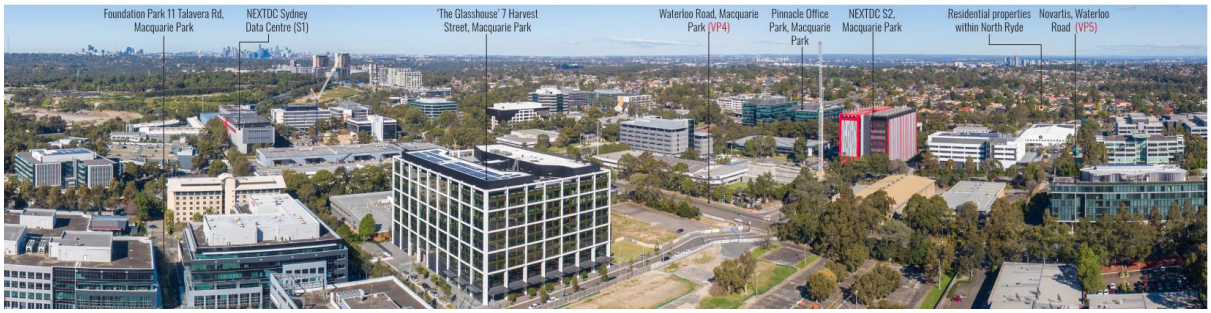


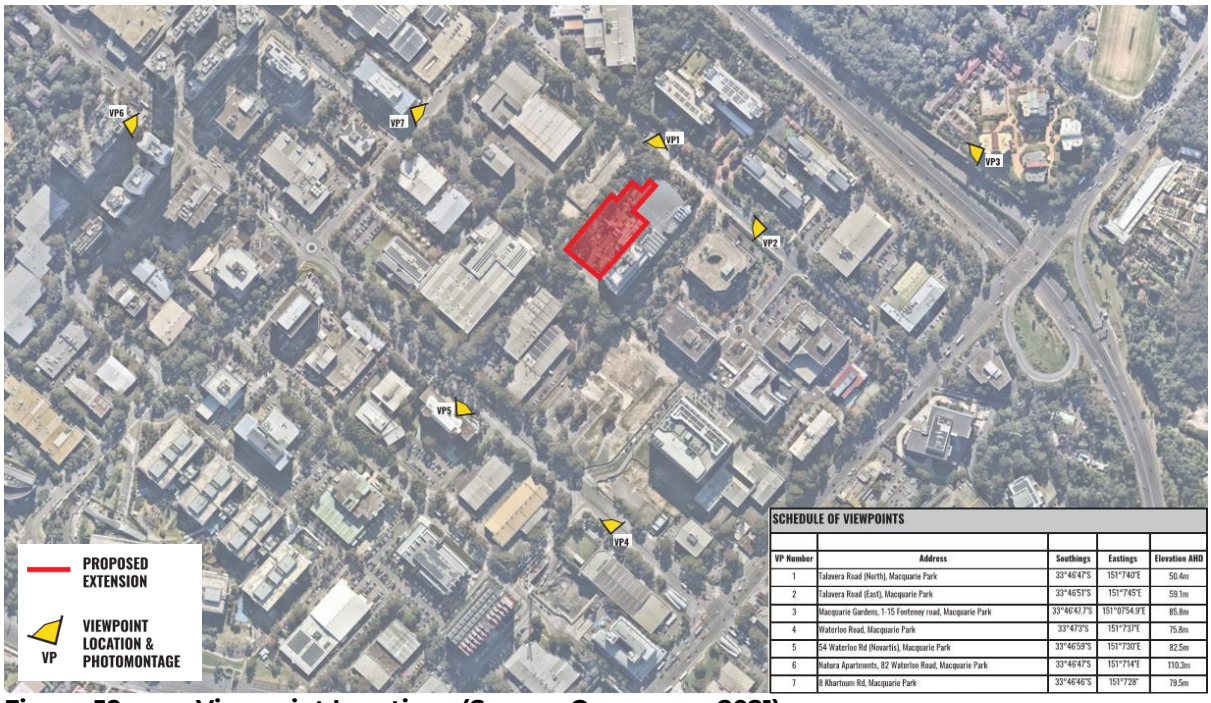
Figure 58 Drone at Position 2 - 100m AGL looking South (Source: Geoscapes, 2021)

6.1.12.4 Visual impact analysis

The visual impact analysis prepared by Geoscapes, and contained within **Appendix 27** of this EIS, has undertaken a thorough assessment of potential visual impacts from a number of viewpoints within the vicinity of the proposed development.

The following list of visual receptors have been selected:

- Talavera Road (North), Macquarie Park (VP1)
- Talavera Road (East), Macquarie Park (VP2)
- Macquarie Gardens, 1-15 Fontenoy road, Macquarie Park (VP3)
- Waterloo Road, Macquarie Park (VP4)
- 54 Waterloo Rd (Novartis), Macquarie Park (VP5)
- Natura Apartments, 82 Waterloo Road, Macquarie Park (VP6)
- 8 Khartoum Rd, Macquarie Park (VP7)



SCHEDULE OF VIEWPOINTS

VP Number	Address	Southings	Eastings	Elevation AHD
1	Talavera Road (North), Macquarie Park	33°46'47"S	151°7'40"E	50.4m
2	Talavera Road (East), Macquarie Park	33°46'51"S	151°7'45"E	59.1m
3	Macquarie Gardens, 1-15 Fontenoy road, Macquarie Park	33°46'41.7"S	151°07'54.9"E	85.8m
4	Waterloo Road, Macquarie Park	33°47'3"S	151°7'37"E	75.8m
5	54 Waterloo Rd (Novartis), Macquarie Park	33°46'59"S	151°7'30"E	82.5m
6	Natura Apartments, 82 Waterloo Road, Macquarie Park	33°46'47"S	151°7'14"E	110.3m
7	8 Khartoum Rd, Macquarie Park	33°46'46"S	151°7'28"	79.5m

Figure 59 Viewpoint Locations (Source: Geoscapes, 2021)

Viewpoint 1:

Viewpoint 1 was taken on the northern side of Talavera Road from the public footpath looking back towards the entry of the development. The extended angle of view shows the MDC site adjacent to the public domain streetscape which includes a cycleway on the south side, street lights and managed landscaping. The proposed IC3W extension is situated behind existing tree planting to the right of the shot.

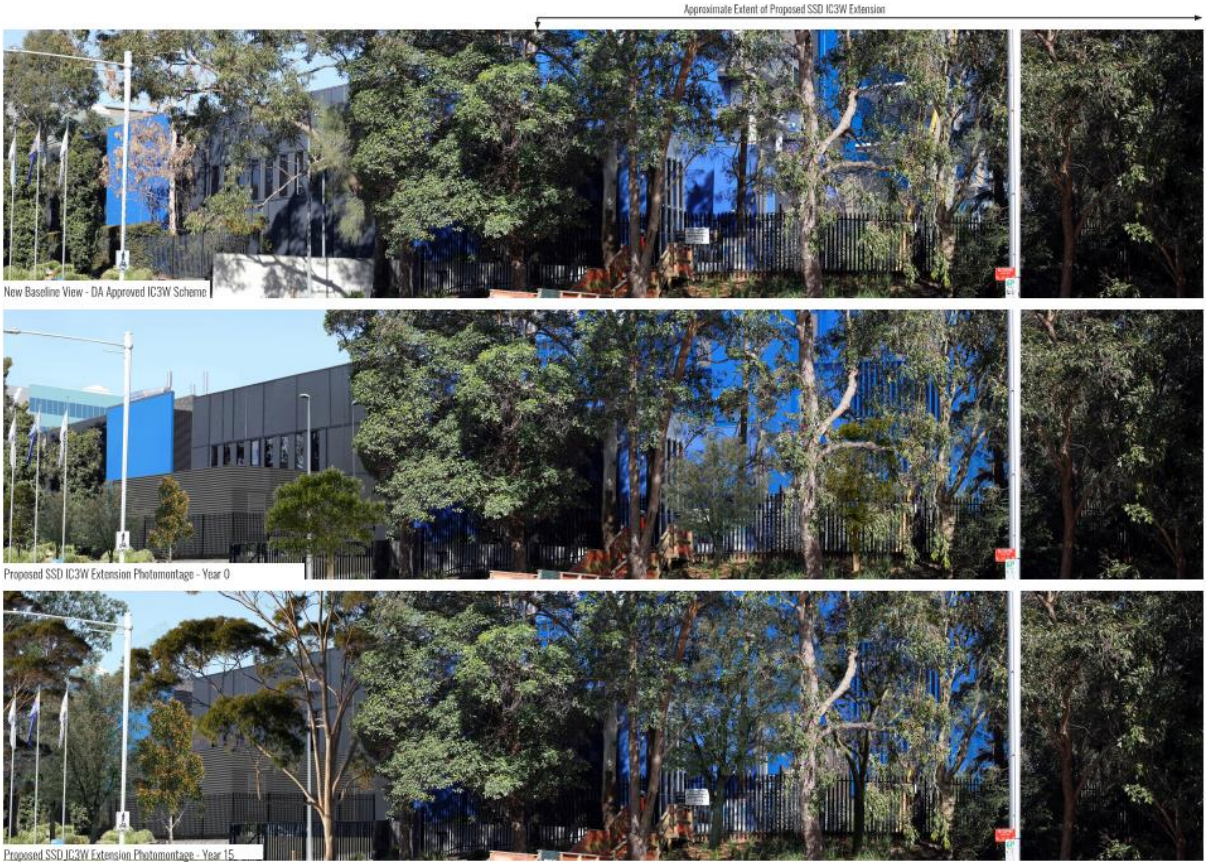


Figure 60 Viewpoint 1 Photomontage (Source: Geoscapes, 2021)

Views looking south as shown in the existing view will generally be experienced by motorists or pedestrians on foot. As this is not a residential area, pedestrians are likely to be commuters walking to work. Views are therefore, likely to be transient and experienced for a short time period only and are unlikely to be of primary focus or importance for these types of receptor. Therefore, the sensitivity has been judged to be medium.

As can be seen in the photomontages from this location, the proposed SSD IC3W Scheme presents an extremely similar view to that of the approved DA scheme. Existing vegetation along Talavera Road and on the development site is already effective at screening the building and reducing the visual impact. Therefore, it is judged that the residual magnitude of change is very low.

The significance of the visual impact at this location is judged to be minor negligible.

Viewpoint 2:

Similar to Viewpoint 1, Viewpoint 2 was also taken along Talavera Road but further to the southeast and at a higher elevation. This allows a view looking west towards the site and along Talavera Road. The extended angle of view photomontage shows a streetscape that is fairly typical of those within the business park with tree lined streets and office buildings. No. 15 Talavera Road adjacent to the development site is highly prominent in the view with office windows and a multistorey car park facing the street.

Figure 61 Viewpoint 2 Photomontage (Source: Geoscapes, 2021)

Views will be transient and for a short time period only, similarly to Viewpoint 1 it will be seen by the same types of receptor groups. The baseline view has also slightly changed with the introduction of the DA approved scheme making the data centre more visible. Therefore, the visual sensitivity has been judged to be medium.

The proposed development will form a new and recognisable element within the view which is likely to be recognised by the receptor. The baseline view will be changed slightly further in the horizontal

and vertical extent, however the IC3W proposed scheme is coherent with the exiting development in unifying materials and finishes. Therefore, it is judged that the residual magnitude of change is medium.

The significance of the visual impact at this location is judged to be moderate/minor.*

* Note: The 'Athena' (SSD-10467) has been represented as an opaque massing model in the Year 15 image. The above significance of visual impact has been determined on the MDC development in isolation only, however once Athena has been constructed the sensitivity from this location is likely to decreased due to another large scale development within the view and in close proximity. This in turn is likely to lower the significance of visual impact.

Viewpoint 3:

Viewpoint 3 exhibits a group of residential apartment blocks (Macqaurie Gardens) to the east of the M2 Motorway which has elevated views towards the site. Not all apartments would be able to see the development as is apparent in the drone photographs. Only those apartments on higher levels and those with windows/balconies facing west would experience views.

The photograph shown within the existing view was taken from the Block B rooftop at an estimated elevation of RL86m, this is to represent the worse case scenario as all apartments are located below this level.

Views are expansive over Macquarie Park and beyond, however the general focus of the view is centred on the many office buildings, apartment blocks and the existing data centre.

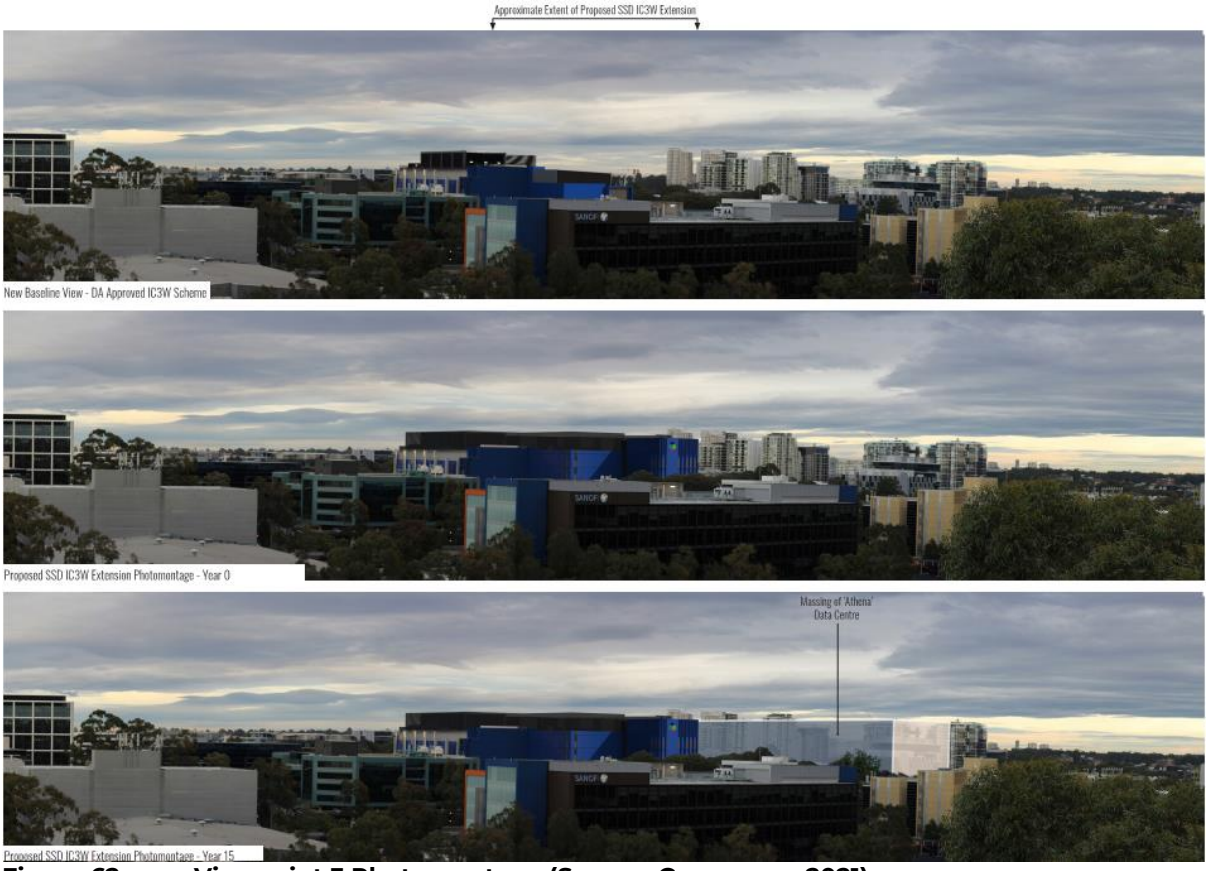


Figure 62 Viewpoint 3 Photomontage (Source: Geoscapes, 2021)

Residential receptors are often more critical of their views and generally more sensitive however, the existing view contains many elements which focus the attention either to office buildings or other residential towers. As an example, 'The Glasshouse' at 7 Harvest Street, is a new element within the view which is highly visible. Longer distance views are possible but these are either to the right of left of this main core.

Therefore, it is judged that the sensitivity of this visual receptor to the development is medium.

The proposed development will form a new and recognisable element within the view which is likely to be recognised by the receptor. The baseline view will be changed slightly further in the horizontal and vertical extent, however the IC3W proposed scheme is coherent with the exiting development in unifying materials and finishes. Therefore, it is judged that the residual magnitude of change is medium.

The significance of the visual impact at this location is judged to be moderate/minor.*

* Note: The 'Athena' (SSD-10467) has been represented as an opaque massing model in the Year 15 image. The above significance of visual impact has been determined on the MDC development in isolation only, however once Athena has been constructed the sensitivity from this location is likely to decreased due to another large scale development within the view and in close proximity. This in turn is likely to lower the significance of visual impact.

Viewpoint 4:

Viewpoint 4 was taken on the southern side of Waterloo Road approximately 100m northwest of Macquarie Park Station. It would be experienced by motorists and pedestrians traveling in a north-westerly direction. Pedestrian visual receptors are those likely to be those walking to work, the university or the station. The existing MDC Data Centre is prominent within the view behind existing vegetation in the foreground.

Macquarie Square is due to be developed in the near future and hording for the site can be seen within the centre of the view on the northern side of Waterloo Road.

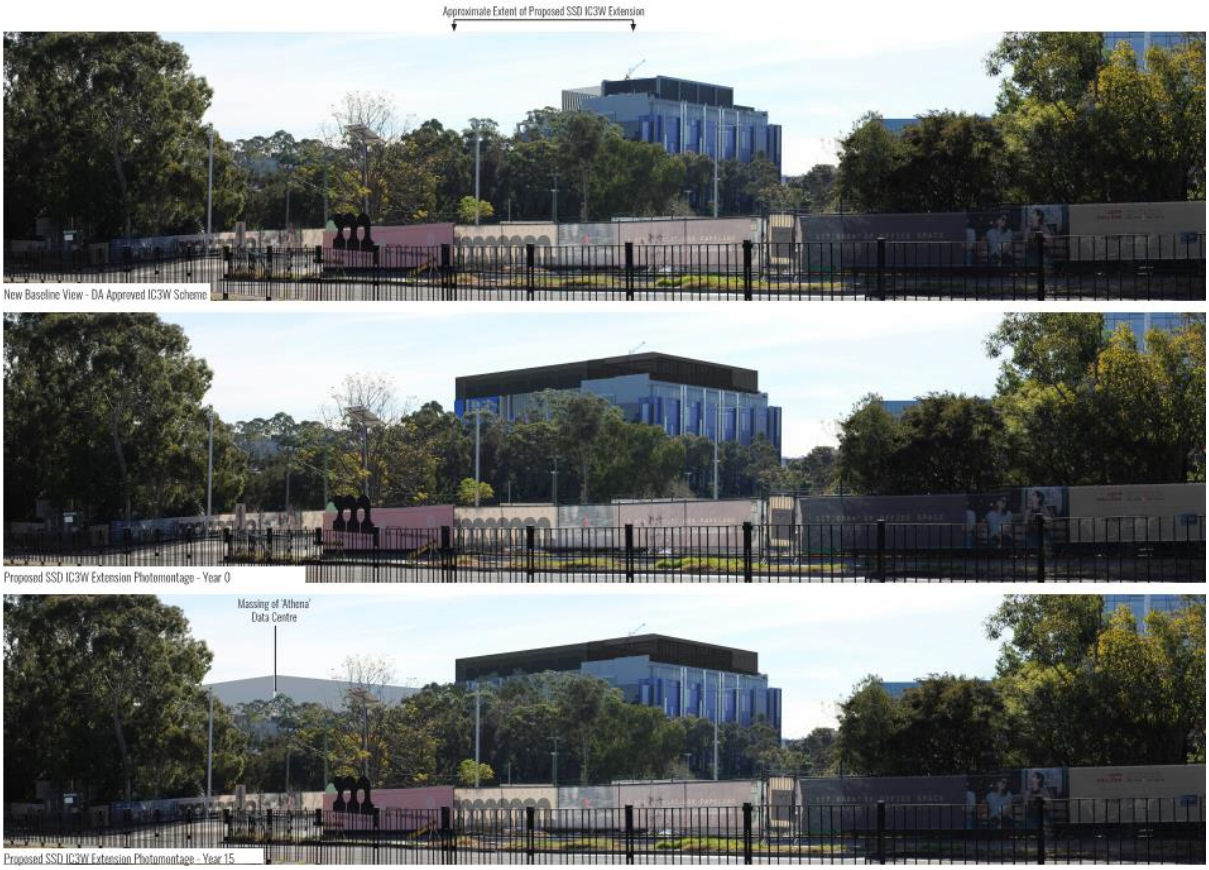


Figure 63 Viewpoint 4 Photomontage (Source: Geoscapes, 2021)

Similarly to Viewpoint 1 and Viewpoint 2, views will be transient and for a short time period only and will be seen by the same types of receptor groups. The baseline view has also slightly changed with

the introduction of the DA approved scheme making the data centre slightly more apparent. Therefore, the visual sensitivity has been judged to be medium.

The proposed development will form a new element within the view, however the addition of the IC3W proposed scheme is somewhat screened by existing vegetation and this will be further strengthened at Year 15 with the maturity of tall canopy tree planting. IC3W will be coherent with the exiting development in unifying materials and finishes. Therefore, it is judged that the residual magnitude of change is low.

The significance of the visual impact at this location is judged to be minor.*

* Note: The visual receptor is located adjacent to the Macquarie Square development at 45-61 Waterloo Road. Following construction of Macquarie Square the MDC Data Centre would likely be no longer visible at this location and further northwest along Waterloo Road. Therefore, any visual impacts assessed may not be relevant in the near future.

Viewpoint 5:

Viewpoint 5 was taken from the Level 5 communal rooftop at 54 Waterloo Road, the office building is currently home to Novartis and Sandoz. As is evident in the existing view the MDC building is prominent within the view together with 'The Glasshouse' development to the right of the shot.

Figure 64 Viewpoint 5 Photomontage (Source: Geoscapes, 2021)

The communal space and windows facing Waterloo Road at higher levels would experience a view. As this receptor is representative of people at their place of work, the view may hold some value to them however, it is unlikely to be of prime importance. The MDC development is screened at lower levels the existing tree line and some longer distance views are possible. Therefore, it is judged that the sensitivity of this visual receptor is medium.

The proposed development will form a new and recognisable element within the view which is likely to be recognised by the receptor. The baseline view will be changed slightly further in the horizontal and vertical extent, however the IC3W proposed scheme is coherent with the exiting development

in unifying materials and finishes. Therefore, it is judged that the residual magnitude of change is medium.

The significance of the visual impact at this location is judged to be moderate/minor.*

* Note: The 'Athena' (SSD-10467) has been represented as an opaque massing model in the Year 15 image. The above significance of visual impact has been determined on the MDC development in isolation only, however once Athena has been constructed the sensitivity from this location is likely to decreased due to another large scale development within the view and in close proximity. This in turn is likely to lower the significance of visual impact.

Viewpoint 6:

Viewpoint 6 was taken from the roof of a new apartment block currently under construction. It would be assumed that only windows facing east would experience views of the development and the amount visible will decrease at lower elevations. The rooftop therefore represents the most open views possible at this location, the view presented is a mix of residential and office developments scattered through tree lined streets. Chatswood CBD is seen on the horizon beyond Lane Cove National Park.

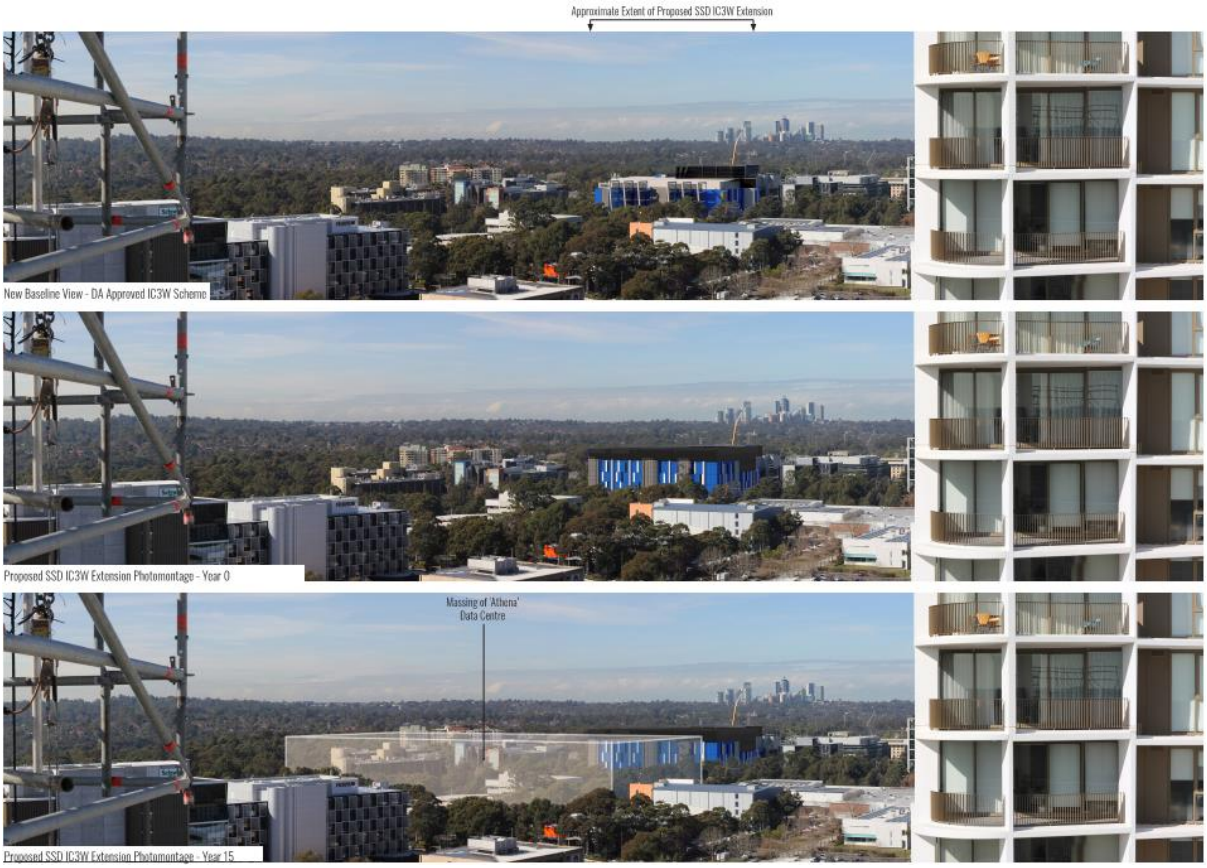


Figure 65 Viewpoint 6 Photomontage (Source: Geoscapes, 2021)

Views of the development are expected from within residential living spaces and residential receptors are often more critical of their views. The introduction of the approved scheme does make the data centre more prominent within the view which already contains many built forms and elements within the immediate context. Therefore, it is judged that the sensitivity of this visual receptor is medium.

The proposed IC3W SSD development will appear very similar in scale to the approved ccheme and will form a minor constituent being at sufficient distance to be a small component. Therefore, it is judged that the magnitude of change is low.

The significance of the visual impact at this location is judged to be minor*.

* Note: The 'Athena' (SSD-10467) has been represented as an opaque massing model in the Year 15 image. Once Athena has been completed it is likely to restrict views from this location towards the MDC site. The Athena development will become a much more dominant element within the view than the proposed MDC expansion; this statement would be true at many visual receptor locations to the east at viewing similar angles.

Viewpoint 7:

Viewpoint 7 is located northwest of the MDC site in a new office development at 8 Khartoum Road. This receptor was determined through drone photography as a recently constructed development that will receive views of the proposal from windows facing this aspect.

The photograph was taken on a fire escape adjacent to Level 5 and would closely represent what might be seen from inside the building. The existing MDC Data Centre is presently partially hidden behind tree canopies.

Figure 66 Viewpoint 7 Photomontage (Source: Geoscapes, 2021)

Windows facing Khartoum Road at higher level would experience a view. The MDC development is screened at lower levels by the existing tree line and some longer distance views are possible.

As this receptor is representative of people at their place of work the view may hold some value to them however, there are many other types of development within the view. Therefore, it is judged that the sensitivity for this receptor to the proposed IC3W expansion would be low.

The proposed development will form a new and recognisable element within the view which is likely to be recognised by the receptor. The baseline view will be changed slightly further in the horizontal and vertical extent however, the IC3W proposed scheme is coherent with the exiting development in unifying materials and finishes. Therefore, it is judged that the residual magnitude of change is medium.

The significance of the visual impact at this location is judged to be minor.*

* Note: The 'Athena' (SSD-10467) has been represented as an opaque massing model in the Year 15 image. Once Athena has been completed it is expected to completely block any views from this location towards the MDC site.

6.1.12.5 Visual impact conclusions

This VIA compares the visual impact of the new SSD IC3W Proposed Scheme against that of the DA approved scheme (LDA/2018/0322). Photomontages of the DA approved scheme are resented within the VIA and become the baseline image in which any further impacts generated by the new proposed scheme are assessed against.

It is concluded that the proposed development will create visual impacts for receptors in close proximity to the site. However, of the locations assessed none of the impacts are considered to be of high significance. This is due to the fact that predominately the type of visual receptor within the immediate area generally has a lower sensitivity rating or the baseline view already contains other highly visible developments. Also a number of the viewpoint locations the difference between the DA approved scheme and the SSD proposed scheme is relatively small.

Further development in and around the MDC Data Centre could also prevent or restrict views of the IC3W proposed scheme in the future, this would be true of 'Macquarie Square' along Waterloo Road and the 'Athena' Data Centre at 11-17 Khartoum Road and 33-39 Talavera Road. The Athena Data Centre has been represented as a massing model in the Year 15 images and it is clear that it will be a very dominant visual element within the view.

This further strengthens the argument that the MDC IC3W expansion would not be out of scale with approved development within the immediate surrounding context.

The conclusions of potential visual impacts have been determined by site visits, desktop study, photographic and photomontage visual analysis. Through analysis conducted within this report, of the receptors assessed, the following locations are judged to receive moderate/minor visual impacts from the proposed development:

- Talavera Road (East), Macquarie Park (VP2)
- Macquarie Gardens, 1-15 Fontenoy Road, Macquarie Park (VP3)
- 54 Waterloo Rd (Novartis), Macquarie Park (VP5)

The following locations are judged to receive minor visual impacts from the proposed development:

- Waterloo Road, Macquarie Park (VP4)
- Natura Apartments, 82 Waterloo Road, Macquarie Park (VP6)
- 8 Khartoum Rd, Macquarie Park (VP7)

The following location is judged to receive minor negligible visual impacts from the proposed development:

- Talavera Road (North), Macquarie Park (VP1)

From analysis of aerial drone photography, it is evident that a number of other office buildings or residential tower blocks from within the study area will receive views of the development. However, as previously mentioned within the report it would be impractical to provide viewpoints and photomontages for every possible visual receptor.

The report also demonstrates that from a select number of locations, proposed additional landscape planting at the development site can help in reducing visual impacts not only for the proposed scheme but also the existing data centre. This will be most effective after 15 years and for those receptors who experience direct views at close to medium range.

6.1.12.6 Solar analysis

Figure 67 and **Figure 68** are extracted from the HDR architectural plans package, to provide a representation of the minor impact of overshadowing, during the morning Spring and Summer solstice to 33 Talavera Road (to the north) and morning Winter solstice to Excelsia College (to the west).

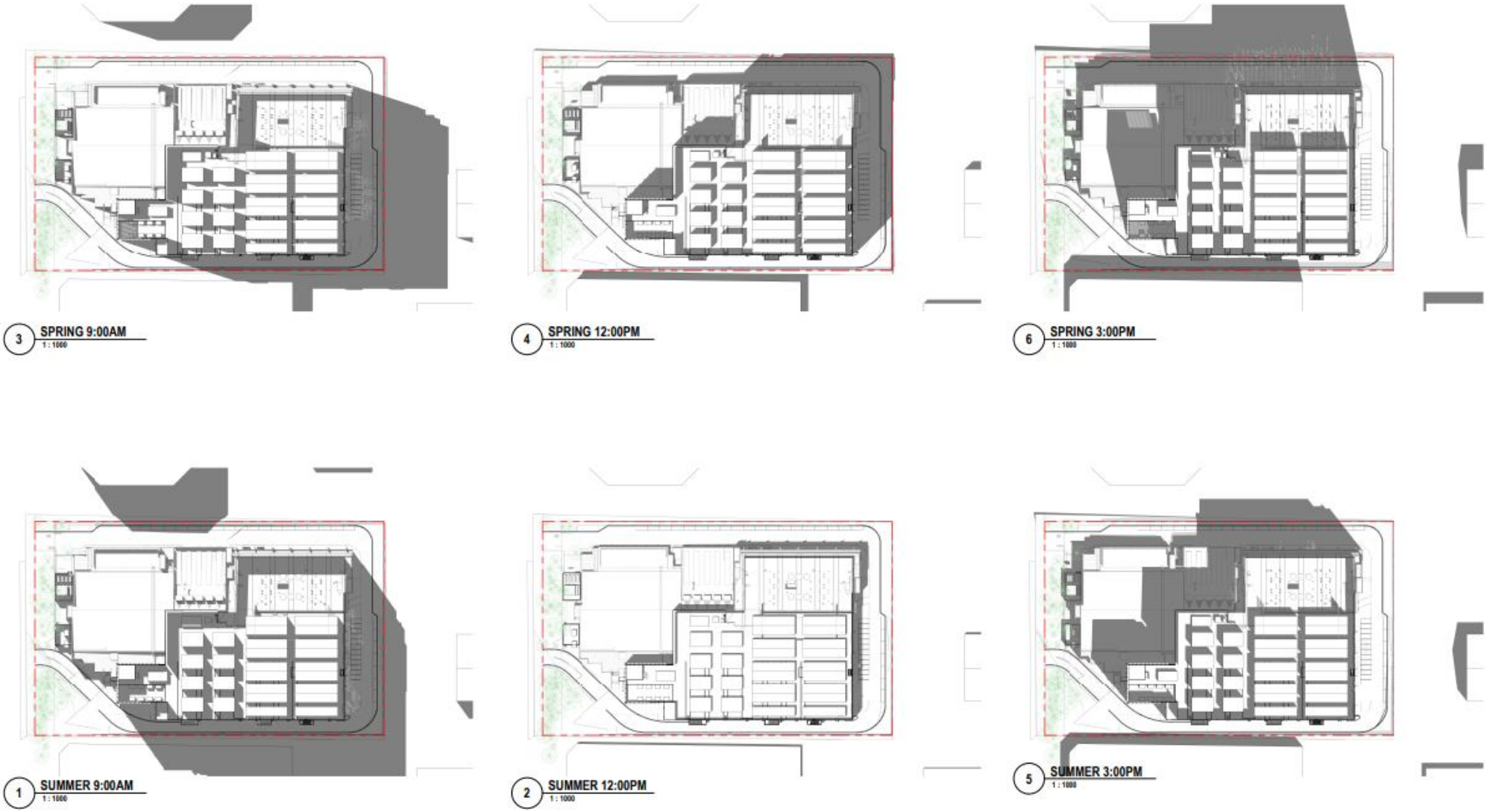


Figure 67 Shadow Diagrams – Spring/Summer (Source: HDR, 2021)

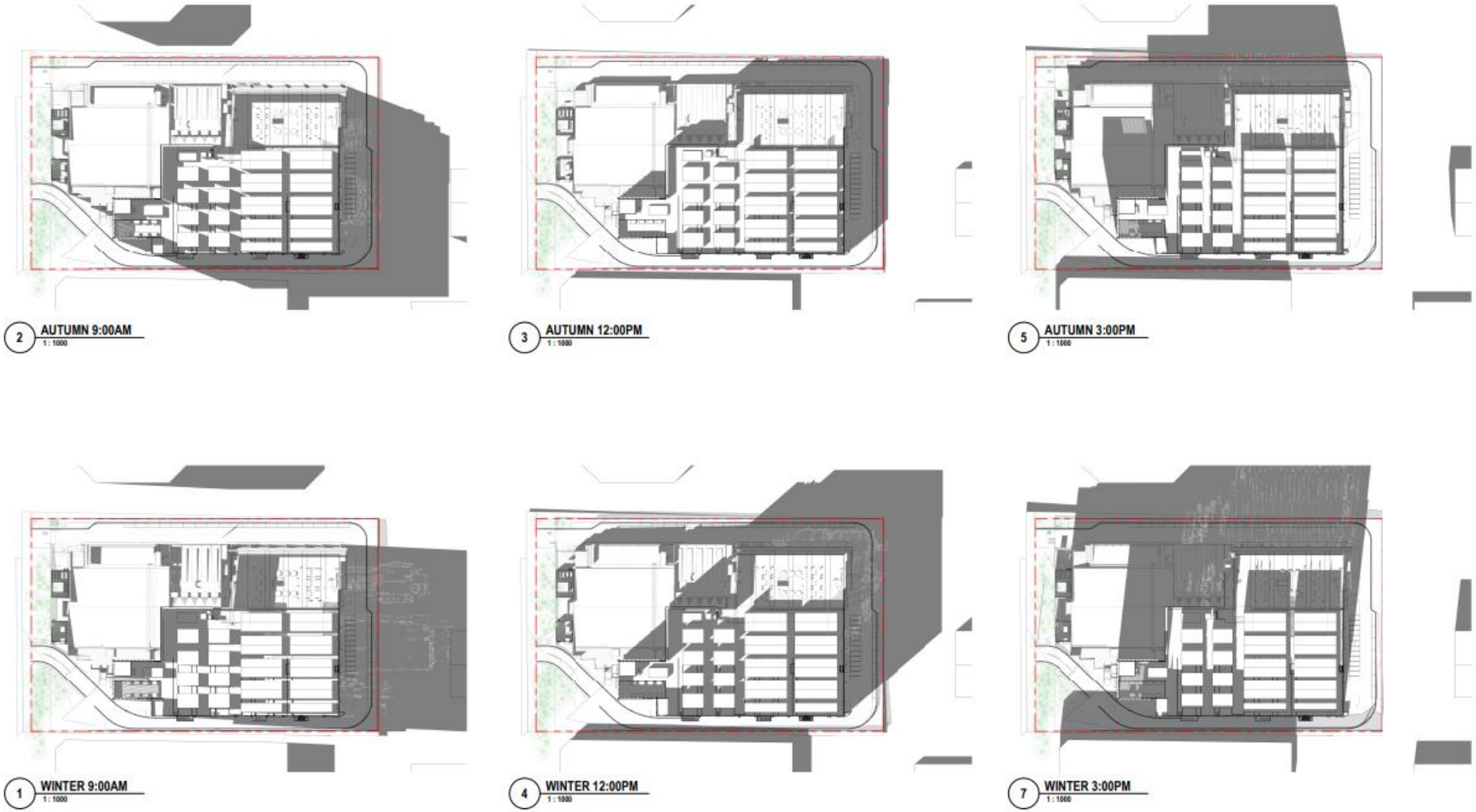


Figure 68 Shadow Diagrams – Autumn/Winter (Source: HDR, 2021)

6.1.12.7 Development accessibility

An accessibility compliance assessment has been undertaken by ABE Consulting, to inform the proposed development. The Accessibility Review Report forms **Appendix 12** of this EIS, and concludes that proposed development can readily achieve compliance with Part D3, Clause F2.4 and Clause E3.6 'deemed-to-satisfy' (DtS) requirements of the BCA, The Disability (Access to Premises - Buildings) Standards 2010 and the pertinent Australian Standards.

6.1.12.8 Surrounding networks

The subject site forms part of the Macquarie Park Corridor, which is the strategic centre of Macquarie Park, being a health and education precinct and an important economic and employment powerhouse in Sydney's North District.

The site is described through its current commercial setting as an existing Data Centre (LDA2018/0322), adjoining surrounding commercial premises along Talavera Road, and forming part of the wider Macquarie Park Corridor.

The site is situated approximately 12.5 km northwest of the Sydney CBD and 11.3 km northeast of Parramatta. It is within close proximity to transport infrastructure routes (predominantly the bus and rail networks), as well as sharing direct links with the wider regional road network, including Talavera Road, Lane Cove Road, Epping Road and the M2 Motorway. These road networks provide enhanced connectivity to the subject site and wider locality.

Additionally, the site is located within close proximity to active transport links, such as bicycle routes, providing an additional mode of accessible transport available to the subject site.

Access to the site is currently provided via Talavera Road along the eastern boundary of the subject site.

As part of the Macquarie Park Corridor, it is noted that the Council's DCP state that its size is comparable in scale to the City of Sydney, but has fewer roads and route choice. The current block size and building footprint lengthens the walk time for foot trips within the precinct and increases reliance on driving. It is clear within the DCP that there are aims in place to create a permeable network of streets and pedestrian ways to improve vehicular, pedestrian and cycle permeability within the corridor.

6.1.13 Ecologically sustainable development

This section of the EIS evaluates the matters of ecologically sustainable development (ESD) associated with the proposal, as per the SEARs, including:

- ***a description of how the proposal will incorporate the principles of ecologically sustainable development in the design, construction and ongoing operation of the development;***
- ***consideration of the use of green walls, green roofs and/or cool roofs in the design of the development;***
- ***a description of the measures to be implemented to minimise consumption of resources, especially energy and water.***

6.1.13.1 ESD initiatives

The following provides a summary of the proposed ESD initiatives.

Indoor air quality:

Ductwork will be protected during construction to minimise contamination with debris and moisture prior to occupation. In order to minimise indoor air contamination and promote occupant health, preference will be given to paints, adhesives, sealants and floor coverings which have low Volatile Organic Compound (VOC) emissions and engineered wood products with low formaldehyde emissions.

Biodiversity:

The site is considered to be of low ecological value as assessed by Cumberland Ecology. A BDAR waiver has been granted for this proposal. A carefully selected landscape setting will be chosen for the subject site, comprising a mix of native and endemic plant species, shrubs, trees and grasses, enhancing the biodiversity of the site. 2,743m^2 of deep soil landscaping has been proposed for the site, equating to 14% of the site being landscaped.

Waste:

A Waste Management Plan has been prepared by SLR, forming **Appendix 33** of this EIS.

Transport:

The subject site is within close proximity to transport infrastructure routes (predominantly the bus and rail networks). 71 car parking spaces have been provided for the proposed development (including three (2) accessible spaces). The subject site is located within close proximity to active transport links, such as bicycle routes. Up to 8 bicycle spaces are proposed for the site. A separate Transport Impact Assessment has been prepared and forms **Appendix 16** of this EIS.

Energy:

Data centres consume significant amounts of power, and energy efficiency is generally considered to be the single most important sustainability feature of any data centre design.

The National Australian Built Environment Rating System (NABERS) provide a star rating system for energy usage within data centres. Three (3) types of rating systems are available – IT Equipment, Infrastructure and Whole Facility. The Infrastructure rating is used within this statement. The two other rating types take IT equipment efficiency (which form part of end customer fit-out and is unknown at this stage) into account and hence is not appropriate for this assessment.

The rating ranges from 4 star to 6 stars. For comparison purposes, the NABERS key principle indicates that an average facility would perform equivalent to 2 to 3 energy stars level.

The NABERS Data Centres Infrastructure rating assesses the efficiency by comparing the following:

- Infrastructure Energy Consumption (i.e. exclusive of IT Equipment)
- IT Energy

The above has been converted to PUE and tabulated as the maximum permissible PUE with respect to each NABERS energy star rating as follows:

TABLE 77: NABERS ENERGY STARS WITH PERMISSIBLE PUE

NABERS Energy Stars	Maximum PUE
3	1.88
4	1.61
4.5	1.48
5	**1.34**
5.5	**1.2**
6	1.07

The Climate Neutral Data Centre Pact (CNDCP) has the following PUE target: By January 1,2025 new data centres operating at full capacity in cool climates will meet an annual PUE target of 1.3, and 1.4 for new data centres operating at full capacity in warm climates.

The proposed design is highly energy efficient. A maximum PUE of 1.3 (using ASHRAE Recommended conditions) is expected, which place the proposed development at NABERS Energy Stars rating between 5 and 5.5 stars and meeting the CNDCP's target of 1.3.

This high efficiency design is achieved through a combination of the following:

- High efficiency chilled water-cooling system.
- VSD drives will be used on fans and pumps allowing turndown and energy savings at part load.
- High efficiency electrical drives will be used on the various systems.
- All lighting to be LED.
- Sub-metering throughout the facility to help monitor and interpret energy consumption in operation and enable optimisation year-on-year.

Water:

WUE is a measure of water efficiency for a data centre and can be defined at a high level as:

$$WUE = \frac{\text{Annual Site Water Usage}}{\text{IT Equipment Energy}}$$

WUE, a site-based metric that is an assessment of the water used on-site for operation of the data centre. This includes water used for humidification and water evaporated on-site for energy production or cooling of the data centre and its support systems.

The lower the WUE the more water efficient a data centre is. However, it is important to consider WUE in the context of PUE, for example an air sourced cooling system would have a WUE of zero but could be less energy efficient resulting in a higher PUE.

The WUE has been calculated in accordance with "*The Green Grid, Water Usage Effectiveness (WUEtm): A green Grid Data Center Sustainability Metric*" to be 1.88 L/Kwhr.

There are no recognised WUE benchmarks or targets set as yet, however it is considered current best practice for data centres to calculate and consider the WUE when designing a data centre. It is anticipated that the CNDCP are to confirm a WUE target in 2022.

The calculated annual water used on-site for operation of the new data centre is 528,113 m^3.

The total annual water usage for existing and new data centres (i.e., IC3E, IC3W and IC2) on site has been calculated as approximately 790,000 m^3.

The proposed design will utilise open circuit cooling towers for heat rejection. This cooling system is highly efficient, contributing to the low PUE value noted above, but will consume significant volume of water. In order to minimise water consumption, the cooling towers will be selected and controlled as follows:

- Towers will be selected to provide no more than 0.002% drift coefficient
- The system will be controlled to operate with no less than 6 cycles of concentration

The above is in line with GBCA good practice for water efficiency and in accordance with AS/NZS3666.1 – Air Handling and Water Systems of buildings – Microbial Control.

The proposed water-cooled heat rejection system benefits from free cooling and is more energy and GHG efficient than an air-cooled chiller system. Air-cooled systems still use some water albeit, off site, as part of the cooling required for fossil fuel powered electricity generation.

As grid electricity becomes decarbonised there will become a point where an air-cooled system could result in low GHG emissions and low water consumption however the most effective option at present from an energy consumption and GHG emissions perspective is the proposed system.

Whilst most of the water used on site will be for the operation of the data centre some will be used for the welfare area. To minimise the potable water usage in the welfare area all sanitary wares will achieve a minimum WELS – 5-star rating.

Materials:

Preference will be given to materials responsibly sourced as per below:

- Fabricated structural Steelwork – Environmental Sustainability charter of the Australian Steel Institute (ASI)

- Steel – ISO 14001 / World Steel Associates Climate Action Programme
- Timber – Reused / FSC / AFC/ PEFC
- PVC – Best practice PVC
- Other – ISO 14001

Precast concrete will be used to expedite construction and reduce the embodied carbon of the development.

Through the implementation of the initiatives noted within this subsection, the project clearly demonstrates the commitment to ESD principles throughout the design, construction, and operation. Additionally, the project design team has worked to optimise energy performance and address key climate related risks posed to the site, work that will continue to be developed throughout the detailed design process.

6.1.14 Greenhouse gas and energy efficiency

This section of the EIS evaluates the energy usage of the proposal and demonstrates all reasonable and feasible measures that would be implemented on site to minimise the proposal's greenhouse gas emissions (reflecting the Government's goal of net zero emissions by 2050).

6.1.14.1 Greenhouse gas (GHG) emissions estimate

Emissions scope and coverage:

For this assessment, the following emissions scope has been assessed:

1. Scope 1 related to direct emissions from sources within the boundary of the proposal;
2. Scope 2 related to the emissions resulting from the consumption of imported electricity from the local electricity grid; and
3. Scope 3 related to the indirect emissions attributable to losses through the electricity transmission and distribution network.

Sources of emissions estimated in this assessment include the following:

- Imported electricity consumed in the operation of the facility; and
- On-site diesel fuel consumption consumed in the monthly testing of backup diesel generators.

Emissions have been estimated on an annual basis under assumption of full and ultimate operational capacity over a 50-year period.

Input data:

Data used for the estimation of GHG emissions has been taken from the National Greenhouse Accounts Factors (August 2020), published by the Australian Government Department of the Environment and Energy. At the time of writing, this was the latest revision of these accounts factors and it is assumed that they are applicable to the estimates at commencement of operation.

Emissions factors associated with relevant sources for the proposal are outlined in **TABLE 78**.

TABLE 78: INPUTS FOR ESTIMATING GHG EMISSIONS

Source	Emissions Factors
Grid electricity	Scope 2: 0.81 kg CO2-e/kWh
	Scope 3: 0.09 kg CO2-e/kWh
Diesel fuel	Scope 1: CO2: 69.9 kgCO2-e/GJ CH4: 0.1 kgCO2-e/GJ N2O: 0.2 kgCO2-e/GJ
Biodiesel fuel (assumed for use 2050)	Scope 1: CO2: 0.0 kgCO2-e/GJ CH4: 0.08 kgCO2-e/GJ

TABLE 78: INPUTS FOR ESTIMATING GHG EMISSIONS	
Source	**Emissions Factors**
	N2O: 0.2 kgCO2-e/GJ

With respect to estimating emissions of an assumed facility life of 50 years, the decarbonisation of the electricity grid has been estimated based on linear interpolation and extrapolation of publicly announced government commitments related to renewable energy targets. Emission for the generation of electricity is projected to decline with increased renewable energy supply while emissions for distribution losses are held constant (as a conservative assumption, although likely also to decline) up to the net zero carbon target of 2050. Diesel emissions have been reduced to current biodiesel emissions factors as the proposed generators are capable of using biodiesel when a suitable supply becomes available in Sydney therefore conservatively estimated the changeover to be 2050. **Figure 69** illustrates the assumed changes to these factors notionally between 2022 and 2072.

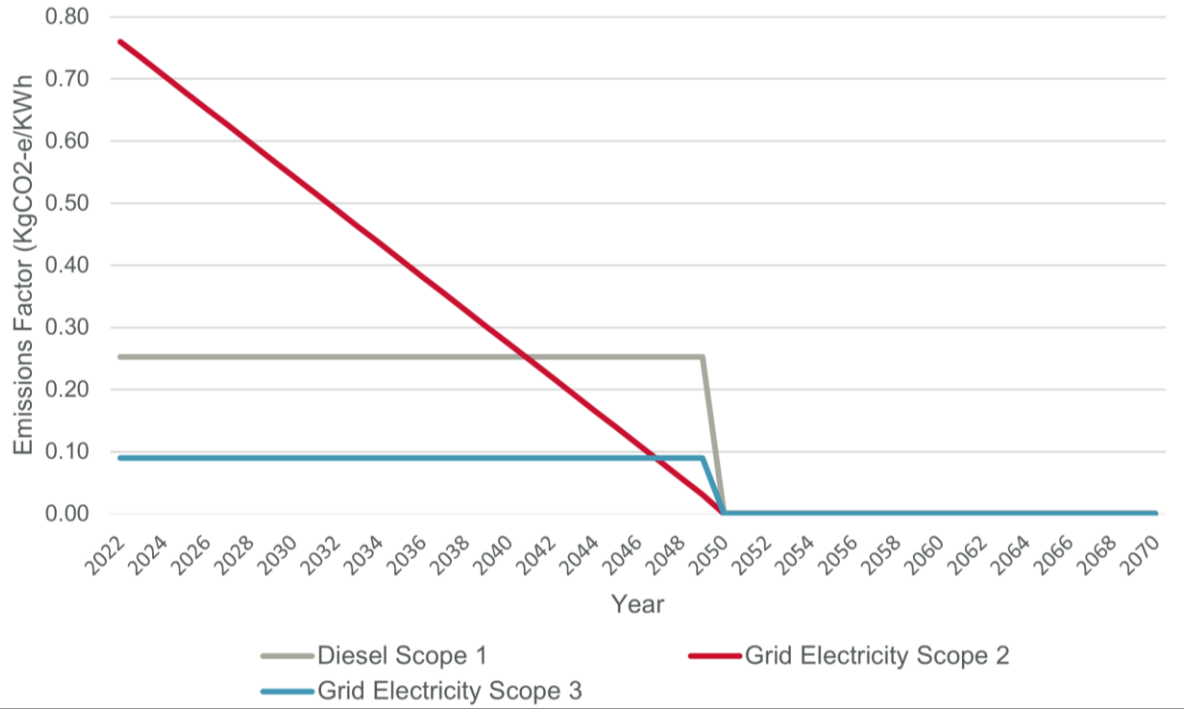


Figure 69 **Projected emissions factor for grid electricity and diesel for the life of the asset** (Source: HDR, 2021)

6.1.14.2 GHG emission estimation methods

Emissions arising from diesel fuel consumption:

Source of scope 1 emissions within the facility are the diesel generators which provide a backup source of electricity for the facility. In total, 18 x 3,000kW/3750 kVA generators will produce scope 1 emissions as a result of monthly generator testing. Generators are tested for operational readiness for 10-15 minutes each per month (total 3 hours per month) at an assumed load of 0% (no load on the generators).

In the first year of operation, based on the predicted 2022 emissions factors, diesel consumption will result in 0.0207 tonnes of CO_2.

Emissions arising from consumption of imported grid electricity:

Scope 2 and 3 emissions are produced through the consumption of imported electricity from the national grid. Electrical energy consumption estimate is based on the maximum power usage for the facility operating at 100%, 365 days a year. The annual energy consumption calculation:

- Maximum site IT Load / Power Consumption: 31.8MW.
- Average annualized Site PUE: 1.30.
- Maximum Total Site Load / Power Consumption: 41.34MW.

- Maximum Annual Energy Consumption for IT Load: 31.8 x 24 x 365.25 = 278.76GWhr.
- Maximum Annual Energy Consumption for Total Site Load: 41.34 x 24 x 365.25 = 362.39GWhr.

In the first year of operation, based on the predicted 2022 emissions factors, electricity consumption will result in 308,032 tonnes of CO_2.

GHG emissions over the life of the asset:

Figure 70 shows the total annual emissions for the predicted 50-year life of the asset, using the predicted emissions factors shown in **Figure 69**.

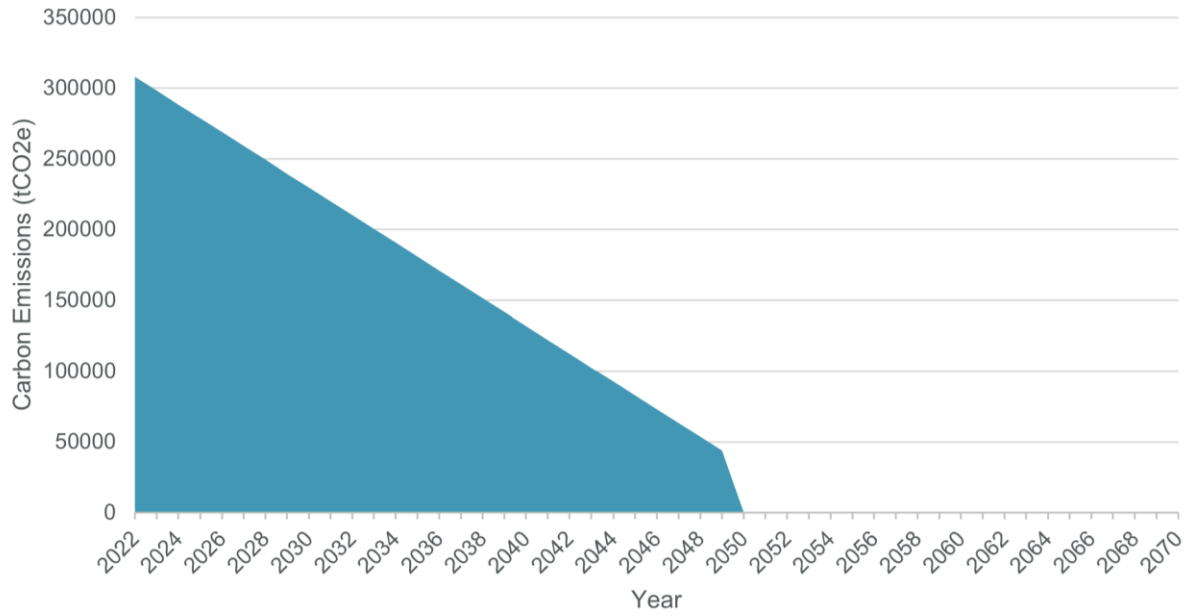


Figure 70 Total CO2 annual Carbon equivalent emissions for the life of the asset (Source: HDR, 2021)

The total GHG emissions for life of the asset is predicted to be 4,926,330 tonnes CO_2 equivalent.

The total GHG emissions for the first year of operations is predicted to be 308,032 tonnes CO_2 equivalent.

The total GHG emissions for the last year of operations is predicted to be 0 tonnes CO_2 equivalent.

The average annual GHG emissions for the life of the asset is precited to be 965,95 CO_2 equivalent.

State and territory GHG inventories:

The State and territory greenhouse gas inventories emissions show that NSW total GHG emissions for 2019 were 136.6 Mt CO2-e. Emissions have declined 17.2% on 2005 levels, mainly due to reductions in emissions from stationary energy (mostly electricity) and the land sector.

The proposed development is predicted to contribute 308,032 tonnes CO_2 equivalent to the 2022/2023 State and territory greenhouse gas inventories. As shown above the predicted GHG emissions will fall year on year in line with the decarbonisation of grid electricity. The proposed generators are capable of using biodiesel when a suitable supply becomes available in Sydney, therefore conservatively estimated the changeover from diesel to biodiesel to be 2050. Through the combination of a decarbonised grid and the use of biodiesel the proposed development is predicted to have 0 GHG contributions by 2050.

Digital infrastructure assets have a central role to play in the transition to a low-carbon economy and sustainable cities and can improve the states GHG emissions per GDP.

Through the implementation of the initiatives noted within **Section 6.1.13.1** of this EIS, the project clearly demonstrates the commitment to ESD principles throughout the design, construction, and operation. Additionally, the project design team has worked to optimise energy performance and address key climate related risks posed to the site, work that will continue to be developed throughout the detailed design process.

6.1.15 Biodiversity

This section of the EIS evaluates biodiversity impacts of the proposed development, as per the SEARs, and addresses the following specific matters:

- **an assessment of the proposal's biodiversity impacts in accordance with the Biodiversity Conservation Act 2016, including the preparation of a Biodiversity Development Assessment Report (BDAR) where required under the Act, except where a waiver for preparation of a BDAR has been granted.**

A BDAR waiver has been granted under section 7.9 of the BC Act. Refer to **Appendix 29** to view a copy of the waiver.

6.1.16 Aboriginal cultural heritage

This section of the EIS evaluates the matters of Aboriginal cultural heritage associated with the proposed development, as per the SEARs, which require:

- **an Aboriginal Cultural Heritage Assessment Report prepared in accordance with relevant guidelines, identifying, describing and assessing any impacts for any Aboriginal cultural heritage values on the site.**

Artefact has commenced preparation of an ACHAR for the subject site. A copy of the draft ACHAR forms part of **Appendix 30** of this EIS. It is noted that a copy of the final ACHAR will be provided with the forthcoming response to submissions phase of the SSD Application.

The process is being undertaken in accordance with the *Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011) and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (OEH 2010).

The consultation process has commenced and is ongoing. The results of the archaeological survey and research concluded that there are no Aboriginal sites in the study area and that there were no areas of potential archaeological deposit. It was concluded that the study has nil to low potential for Aboriginal objects, due to the disturbed nature of the site.

However, as consultation is not yet completed, we are waiting for feed-back from Aboriginal stakeholders regarding any cultural or archaeological significance relating to the site or its surrounds.

<u>Actions to date</u>

Agency Letters seeking the names and organizations of potential Aboriginal Stakeholders were sent out on 6 September 2021 and a Public Notice seeking the same was placed in *The Weekly Times* on 8 September 2021. Agency Letters were sent to the following:

- Heritage NSW
- National Native Title Tribunal
- NTSCorp
- Office of the Registrar
- City of Ryde
- Greater Sydney Local Land Services

Agencies and interested parties had 14 days to respond.

In response to the information obtained through the Agency Letters and the Public Notice, an *Invitation to Register an Interest* to participate as a *Registered Aboriginal Party* (RAP) was emailed and/or posted to 47 individuals/organization on 24 September. Potential respondents had 14 days

to reply and register their interest to participate. Seven (7) individuals/organizations replied to register as RAPs.

On 12 October 2021, a Methodology Letter was sent to the 7 RAPs. The primary purpose of this letter is to provide information on the methodology to provide an ACHAR, and to request comment on the methodology as well as an indication of the cultural significance of the study area. The period of this review is 28 days, and will come to a close on the 9 November 2021.

Future actions

A draft of the ACHAR has been prepared. Any feedback from RAPs will be incorporated into the report to produce the final report. It is anticipated that the final ACHAR will be sent out for review by the RAPs on or around 9 November 2021 and the closing date for comment from the RAPs would, in this case, be in early December (at the end of the 28 day review period).

Once the review process is completed, all correspondence relating to the consultation will be appended to the final report, and the ACHAR submitted.

A summary of progress has been provided by Artefact, which is included within **Appendix 30** of this EIS.

Consultation with the RAPs is continuing and the RAPs will be provided a draft of the CHAR for commentary and feedback.

Following the unexpected finds policy below, consultation with RAPs would continue at completion of the ACHAR.

Unexpected finds

An unexpected finds policy would be implemented in the event of any unexpected finds of Aboriginal sites, objects, or archaeological deposits being identified during construction.

An unexpected archaeological finds policy would involve the following actions:

- Stop work within the affected area, protect the potential archaeological find, and inform environment staff or supervisor
- Contact a suitably qualified archaeologist to assess the potential archaeological find
- If Aboriginal archaeological material is identified, works in the area should cease, and NSW Heritage should be informed. Further archaeological mitigation may be required prior to works recommencing
- If human remains are found:
    - Immediately cease all work at the particular location
    - Notify site manager and project archaeologist
    - Notify NSW Police
    - Notify Heritage NSW on the Environment Line 131555 as soon as practicable and provide details of the remains and their locations
    - Notify the Metropolitan Local Aboriginal Land Council

6.1.17 Non-Aboriginal cultural heritage

This section of the EIS evaluates the matters of Non-Aboriginal cultural heritage associated with the proposed development, as per the SEARs:

- **An assessment of potential impacts on non-Aboriginal cultural heritage items and values on the site and/or in the surrounding area.**

Artefact has undertaken a search of all relevant heritage registers on 4 May 2021. The study area includes no heritage listed items, and there are no heritage listed items within 200m of the study area – refer to **Figure 71** below.

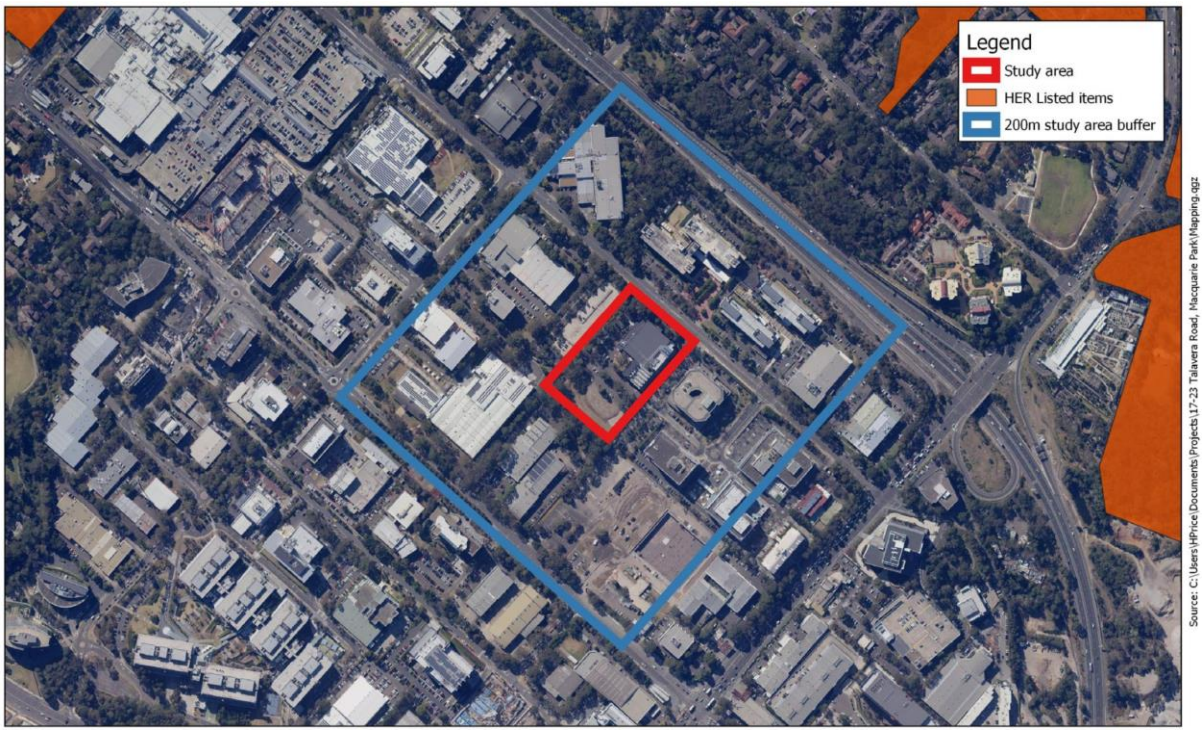


Figure 71 Study area with 200m buffer zone in relation to heritage listings (Source: Artefact, 2021)

During construction works, it is recommended that:

- An Unexpected Finds Policy is developed in the unlikely event that relics are identified during ground disturbing works.
- All relevant staff, contractors and subcontractors should be made aware of their statutory obligations for heritage under the NSW Heritage Act 1977 and best practice as outlined in The Burra Charter 2013. This may be implemented as a heritage induction.

6.1.18 Socio-economic

This section of the EIS evaluates the socio-economics associated with the proposed development, as per the SEARs, in provides

- **an analysis of any potential economic impacts of the development, including a discussion of any potential economic benefits to the local and broader community.**

A robust Social Impact Assessment (SIA) has been prepared by Astrolabe Group; refer to **Appendix 32** of this EIS. The following subsections intend to summarise the findings of the SIA, particularly relating to any potential economic impacts and/or economic benefits.

6.1.18.1 Socio-economic impacts analysis

The proposal is expected to have the greatest negative impact during the construction phase, though limited to the site's immediate surroundings. As surrounding development is low scale, with low density of people, the magnitude of these impacts are expected to be relatively low, and can be managed with plans to mitigate certain construction activities.

Overall, long term socio-economic impacts of the proposal are expected to be positive, with benefits to be felt by groups extending beyond the immediate study area, through the enhanced digital connectivity and broad economic benefits realised in operation.

The impacts of the proposal on the local community, economy, and place has been assessed in regard to the social elements of value to people, as identified in NSW DPIE's 'Social Impact Assessment Guidelines'. This includes health and wellbeing, surroundings, accessibility and community.

Noise and vibration impacts:

The Noise and Vibration Assessment Report (**Appendix 14**) provides an assessment of potential noise and vibration at sensitive receives located near the site during construction and assessment of operational noise levels during operation.

Exposure to noise and vibration at high levels or for sustained periods can create annoyance, and/or interfere with concentration, ability to carry out activities or sleep. There can also be longer term health impacts from excessive exposure to noise and vibration.

Noise and vibration assessments were undertaken for the proposal's construction phase. Predicted noise levels were assessed in accordance with the NSW Noise Policy for Industry (EPA 2017). During construction neighbouring developments, including sensitive residential developments, are expected to be exposed to noise however the implementation of noise mitigation measures will mitigate these impacts resulting in no neighbouring receivers being predicted to be highly noise affected.

Out of standard construction hours activities (Period 1) is expected to have slightly above the noise management levels for neighbouring receivers immediately to the south-west of the site, which includes an educational premises, Excelsia College at 63-71 Waterloo Road. Noise mitigation measures will assist in reducing noise levels as much as possible during this period.

Construction traffic to and from the proposal site on public roads is predicted to be insignificant, therefore having negligible impact.

There is a low risk of vibration impact during the construction phase.

Operation of the proposal is modelled to have very little to no impact on surrounding receivers and is predicted to comply with the applicable policies and guidelines.

The significance of noise and vibration impacts on the community is low to medium.

Air quality:

The main potential sources for air emissions identified in the AQIA (**Appendix 15**), are:

- Suspended particulate matter and deposited dust during the construction stage.
- Particulate matter during the operational stage.
- The dispersion of emissions due to emergency conditions (on the occasion that there is a loss of all feeders to the site, requiring generators to operate simultaneously).

A total of nine representative sensitive receptors were identified in undertaking the AQIA, with the closest located approximately 120 metres from the proposal. The representative sensitive receptors included childcare centre outdoor areas, residences (ranging from ground floor to seventh floor) and air intakes up to 900m from the proposal site.

The AQIA found that during both construction and operational phases, the risk of dust emissions and ambient air quality exceeding the relevant criteria and causing nuisance to sensitive receptors is unlikely.

In the event that emergency conditions occur, and all generators operate simultaneously, there is a low chance that air quality compliance requirements will not be met at one sensitive receiver. The AQIA suggests however, that the likelihood of this occurring is vanishingly small.

Overall, the significance of air quality impacts during construction and operation is low.

As the significance of noise and vibration, and air quality impacts are low to medium, and mitigation measures are in place to further lessen the impact which are limited to the construction phase, it is expected that the socio-economic impact of the proposal on health and wellbeing are low.

Visual amenity:

The proposal site sits adjacent to an existing data centre, the recently completed 'IC3e' extension. The proposal will tie into this existing building, extending the development footprint to the north and west. As the proposal is situated within a highly urbanised area close to the commercial core of Macquarie Park, surrounding developing is characterised by large, multi-storey commercial offices, data centres and educational facilities, consistent with the character of a business precinct. Site and aerial analysis show that the proposal is not out of character for the site or the surrounding area.

At approximately 44m tall at completion, the proposal will be the same height as the existing IC3east. Seven viewpoints were used in assessing the proposal's visual impact, with a summary of significance at each viewpoint as follows:

- Talavera Road (North), Macquarie Park: minor negligible
- Talavera Road (East), Macquarie Park: moderate/minor
- Macquarie Gardens, 1-15 Fontenoy road, Macquarie Park: moderate/minor
- Waterloo Road, Macquarie Park: minor
- 54 Waterloo Rd (Novartis), Macquarie Park: moderate/minor
- Natura Apartments, 82 Waterloo Road, Macquarie Park: minor
- 8 Khartoum Rd, Macquarie Park: minor

The VIA (**Appendix 27**) notes that where overall significance is predicted to be moderate or higher, the likely impact is considered substantial, therefore where the significance is considered moderate/minor and below, impacts are not considered to be substantial. As a result, none of the viewpoints are assessed as being significantly impacted in regard to visual amenity. This is due to the receptors within the immediate area having low sensitivity, or the baseline view already containing other highly visible developments.

Overall, the significance of visual amenity impacts is low. It is expected that the socio-economic impact of the proposal on surroundings are low.

Traffic/transport:

The Transport Impact Assessment and Preliminary CTMP assess impacts of the proposal on traffic and parking, during construction and operational phases. The Preliminary CTMP and Transport Impact Assessment note the following:

- During the construction phases, it is expected that there would be up to 50 construction vehicles generated from the proposed construction activities of the site. In addition, it is anticipated that there would be up to 7 vehicles (7 in; 7 out) per hour during the busiest period.
- A total of 71 car parking spaces would be provided on-site for works and visitors, which is expected to exceed the peak parking demand.
- 3 accessible parking spaces are proposed, exceeding the RDCP2014 requirements.
- 10 on-site bicycle parking spaces are proposed, exceeding the RDCP2014 requirements.
- The proposed operation is expected to generate at most, 23 vehicle trips per hour in the AM and PM peak period. This equates to one vehicle movement every two to three minutes, which is considered negligible. Hence, the proposed development traffic is considered minimal and could not be expected to result in any noticeable traffic impacts on the surrounding road network.

Overall, the significance of traffic impacts is low. It is expected that the socio-economic impacts of the proposal on accessibility are low.

Community values:

The proposal generates positive impacts for the local Macquarie Park community and aligns with its values and expectations for the future in relation to growth and change in Macquarie Park.

The proposal is consistent with the Community Strategic Plan vision for the City of Ryde. The data centre expansion will support positive socio-economic impacts across the seven identified categories, it is most relevant to the category 'Our smart and innovative city'.

The proposal supports community aspirations for Macquarie Park as home to world-class businesses, innovation, research and education precinct. The proposal also aligns with improved movement and place outcomes for Macquarie Park, noting its strategic location next to Macquarie Park Station.

The proposal aligns with the vision for North Park (Ngalawala), as set in the Draft Macquarie Park Place Strategy, supporting the generation of a new commercial activity hub. The data centre expansion does not impact on the current and future amenity of the North Park neighbourhood area.

The proposal supports liveability and sustainability outcomes for Macquarie Park through improved utilisation of an existing site.

Overall, the significance of impacts on community values is low. It is expected that the socio-economic impacts of the proposal on community are low.

Job creation:

The proposal will create approximately 1,200 direct construction jobs during the construction phase. This also creates indirect positive economic benefits for local hospitality and retail venues during the construction phase where construction workers located on site choose to visit these venues and purchase food and drink, in particular.

During operation the proposal is expected to generate direct employment opportunities, supporting approximately 49 ongoing jobs.

NSW's economic development ambitions place an increased reliance on the role of the digital economy and related investment in leading-edge physical infrastructure. IC3 Super West, will be one of the most advanced data centres in Sydney, a vital investment in supporting economic growth, creating jobs of the future, building sovereign security skills, and offering protection against cyber threats.

NSW Government's Jobs Plus Program commits $250 million to strengthening the state's economy, creating up to 25,000 jobs before 30 June 2022 by supporting companies expanding their footprint in NSW. Through Investment NSW, the Jobs Plus Program has confirmed its support for this project, providing infrastructure rebates and payroll tax relief to accelerate the creation of additional jobs on this site. This support will facilitate the development of a new Sovereign Cyber Security Centre of Excellence, bringing NSW one step closer to its vision of being the leading cyber security jurisdiction in the Asia Pacific Region. The Centre will create more than 1,200 immediate indirect jobs, and host initial 31 highly skilled specialist roles by 2024, growing the state's workforce of cyber security experts.

Digital technology impacts:

The operation of the project has a large digital reach and services business and communities beyond the study area. There will be broader economic impacts experienced by communities further afield as a result of the project.

The proposal generates positive impacts for the community and aligns with the local Macquarie Park and broader Greater Sydney communities' expectations around digital technology and reliance on this to support their daily lives.

Expansion of the existing data centre provides critical enabling infrastructure, supporting the high-tech economic specialisations of the Eastern Economic Corridor and Macquarie Park innovation district. Considering the economic specialisations of the City of Ryde in high-tech industry sectors, increasing data centre capacity is a core requirement for current and future business activity in the City of Ryde.

The clustering of growth industries in Macquarie Park relies on increased data centre capacity. Data centre capacity will be increasingly central to place characteristics that can attract and retain skills and talent. These facilities need to be place to support the transformation of Macquarie Park into an innovation district.

Increased data centre capacity will support the increasing shift to hybrid working arrangements, evidenced during ongoing management of COVID-19 and shift to digital delivery. The need for reliable, sovereign and secure data storage for public and private sector operations.

Further, increased data centre capacity supporting businesses to operate securely online. Not only does this make businesses more resilient to future disruption, but it provides people who are able to work flexibly with greater choice about where they are able to live – supporting the 30-minute city vision.

6.1.19 Waste

This section of the EIS evaluates the matters of waste associated with the proposed development, as per the SEARs, in particular:

- ***details of the quantities and classification of all waste streams to be generated on site during construction and operation;***
- ***details of waste storage, handling and disposal during construction and operation; and***
- ***details of the measures that would be implemented to ensure that the development is consistent with the aims, objectives and guidance in the NSW Waste Avoidance and Resource Recovery Strategy 2014-2021.***

A Waste Minimisation and Management Plan has been prepared by SLR Consulting, to identify potential wastes to be generated by the proposed development during site preparation, construction and operation. This includes a description of how waste will be handled, processed and reused, recycled or managed in accordance with both the SEARs and Council requirements.

A copy of the Waste Management Plan is included in **Appendix 33** of this EIS.

6.1.19.1 Construction Waste

Construction waste types and quantities:

The site preparation and construction of the project is likely to generate the following broad waste streams:

- Site clearance wastes
- Construction wastes
- Plant maintenance waste
- Packaging wastes, and
- Work compound waste from on-site employees.

A summary of likely waste types generated from site preparation and construction activities, along with their waste classifications and proposed management methods, is provided in the following subsections.

Site preparation waste

The project will be constructed on previously disturbed land comprising commercial/industrial land associated with the Macquarie Industrial Park. Site preparation activities associated with the proposal are anticipated to include:

- Removal of existing internal access roads circling the site
- Removal of existing car parking adjacent to current data centres

SLR has assumed car parking and roads are constructed of asphalt with a sub-layer of road base beneath. Council's guidelines to not provide waste generation rates for site preparation of demolition activities for carparks or roads. It is anticipated that the construction zone will encompass approximately 5,660 m^2. This has been estimated by measuring the proposed ground floor footprint for the IC3-West from the General Arrangement Plan (HDR-AR-2101). Estimates for depth of disturbance are based on SLRs experience on other projects.

Based on these assumptions, SLR estimates the volume of waste to be generated by the removal of asphalt and road base is estimated, as shown in **TABLE 79** below. Road base should be reused on site where possible. Asphalt should be removed from site for recycling at an appropriately licensed facility.

TABLE 79: ESTIMATED QUANTITIES OF SITE PREPARATION WASTES				
Project component	**Material**	**Surface area (m^2)**	**Depth (m)**	**Volume (m^3)**
Construction footprint	Asphalt	5,600	0.05	280
	Road base	5,600	0.1	565

Council's DCP requires details of waste storage areas during demolition, construction, and ongoing operation to be submitted in support of the application. These should clearly show the location and provision for the storage and collection of waste and recycling. Stockpiles and site waste bins during construction should be sited to consider environmental factors and neighbouring properties.

It is possible that additional material will be generated during site preparation activities, such as preliminary groundworks or excavations for foundations. SLR recommends that excavated spoil is classified by a specialist contaminated land consultant and separated into contaminated materials, if any, uncontaminated fill or ENM.

Uncontaminated fill or ENM should be retained on site and managed appropriately for beneficial re-use for filling earthworks. As a last resort, remaining uncontaminated fill of ENM is to be sent off-site to a licenced facility in accordance with the Protection of the Environment Operations (Waste) Regulation 2014. The retention of waste tracking information on site is required by the NSW Government to demonstrate which facility received the material for recycling or disposal.

Construction waste

The Construction Site Manager will need to specify the types and quantities of wastes produced during
construction and on this basis, the numbers and capacity of skip bins can be determined.
In the absence of readily available construction waste generation rates from Council, SLR has adopted the waste generation rates from Appendix A of The Hills Development Control Plan (DCP) 2012 for estimating the type and quantities of waste generated from construction of the Project. The waste generation rates listed in the Hills DCP include '2 Bedroom', '3 Bedroom', 'Block of Flats', 'Factory' and 'Office'. SLR has adopted the 'Factory' and 'Office' rates to measure waste expected from the project, as the construction of a factory and office is the most relevant in representing the construction of the data centre.

Actual waste quantities and composition will vary; however, this estimate is provided so that the Construction Site Manager can make provision for on-site or off-site re-use and recycling opportunities. The construction wastes quantities anticipated from the construction of the proposal are provided in **TABLE 80**.

TABLE 80: ESTIMATED TYPES AND QUANTITIES OF CONSTRUCTION WASTE								
Project component	**Area (m^2)**	**Waste types and quantities (m^3)**						
		Timber	**Concrete**	**Bricks**	**Gyprock**	**Sand and soil**	**Metal**	**Other**
Office space	1,506	10	30	15	15	15	5	10
Data centre	7,522	5	20	15	5	40	5	5
Ground floor	2,700	-	85	-	-	40	15	25
Total construction waste	**11,728**	**15**	**135**	**30**	**20**	**95**	**25**	**40**

The Site Manager is responsible for updating construction waste estimates once waste streams, estimated quantities, and final disposal locations and recycling services have been identified.

Construction waste storage, handling and disposal:

In accordance with the Waste Management Plan, prepared by SLR Consulting, the site preparation and construction phases will target the following waste management strategies, in order of priority:

1. Waste avoidance
2. Reuse
3. Recycling
4. Disposal

6.1.19.2 Operational Waste

Targets for new development are expected to contribute to state specific targets. The NSW Waste and
Sustainable Materials Strategy 2041 (DPIE, 2021) sets a target of:

- 80% average recovery rate from all waste streams by 2030.

Analysis by DPIE (2021) indicates that commercial and industrial waste recovery rates in FY19 were 53%.
Council's Waste Management Strategy was released in 2014 and predates the updated State Strategy, aligning closely with the NSW Waste Avoidance and Resource Recovery Strategy 2014-2021. There are no specific targets in the current Waste Management Strategy relating to Commercial and Industrial Wastes, other than aligning with the State targets.

It is anticipated that the waste minimisation measures in the following subsections will assist the Project to meet the state's targets. Waste reporting and audits can be used to determine the actual percentage of waste that are being, or have been, recycled during operation.

Potential waste types, classification and management methods:

TABLE 81: WASTE TYPES, CLASSIFICATIONS AND MANAGEMENT METHODS FOR OPERATIONAL WASTE

Waste types	NSW EPA Classification	Proposed management method
General operations		
Clean office paper	General solid waste (non-putrescible)	Paper recycling at off-site licensed facility
Cardboard including bulky cardboard boxes	General solid waste (non-putrescible)	Cardboard recycling at off-site licensed facility
Recyclable beverage containers, glass and plastic bottles, aluminium cans, steel cans	General solid waste (non-putrescible)	NSW container deposit scheme 'Return and Earn', container recycling at off-site licensed facility
Food waste	General solid (putrescible) waste	Compost on or off-site or dispose to landfill with general garbage
Batteries	Hazardous waste	Off-site recycling, alternatively contact the Australian Battery Recycling Initiative for more information
Mobile phones	Hazardous waste	Off-site recycling; can be taken to the Mobile Muster program. Contact Mobile Muster for more information
Bulky polystyrene	General solid waste (non-putrescible)	Off-site recycling or disposal at landfill
Furniture	General solid waste (non-putrescible)	Off-site reuse or disposal to landfill
E-waste	Hazardous waste	Off-site recycling
Printer toners and ink cartridges	Hazardous waste	Off-site recycling, free disposal box or bags and pickup service exists for printer toners and ink cartridges

TABLE 81: WASTE TYPES, CLASSIFICATIONS AND MANAGEMENT METHODS FOR OPERATIONAL WASTE		
Waste types	**NSW EPA Classification**	**Proposed management method**
General garbage, including non-recyclable plastics and street sweepings	General solid (putrescible and non-putrescible) waste	Disposal at landfill
Maintenance		
Spent smoke detectors	General solid waste (non-putrescible) or Hazardous waste (some commercial varieties)	Disposal to landfill, or off-site disposal at licensed facility
Glass, other than containers	General solid waste (non-putrescible)	Off-site recycling
Light bulbs and fluorescent tubes	Hazardous waste	Off-site recycling or disposal, contact FluoroCycle[2] or Lamp Recyclers[3] for more information
Cleaning chemicals, solvents, area wash downs, empty oil or paint drums, chemical containers	Hazardous waste if containers used to store DGs (Class 1, 3, 4, 5 or 8) and residues have not been removed by washing or vacuuming. General solid (non-putrescible) waste if containers cleaned by washing or vacuuming.	Transport to comply with the transport of DGs Code applies in preparation for off-site recycling or disposal at licensed facility
Garden organics - lawn mowing, tree branches, hedge cuttings, leaves	General solid waste (non-putrescible)	Reuse on-site or contractor removal for recycling at licenced facility
Production waste		
E-waste	Hazardous waste	Off-site recycling at a licenced facility

Estimated quantities of operational waste:

Schedule C of Section 7.2 Waste Minimisation and Management of Council's DCP provides commercial waste and recycling generation rates. These do not specifically apply to the nature of a data centre operation. Macquarie Data Centre's has provided existing waste arisings for the existing IC2 facility. SLR has used these actual rates of generation to estimate operational rates for the development. In discussion with Macquarie Data Centres, SLR has calculated the overall waste needs for the 3 data centres to allow the development of a waste storage area that allows for waste management of entire campus wastes.

Existing waste collections are:

- General waste: 1 x 4,500 L bin collected weekly (approximately 75% full on collection)
- Cardboard: 2 x 660 L bin collected weekly (approximately 75% full on collection)
- Approximately 10 x pallets a month

SLR has calculated the waste generation rate from the overall data centre campus by extrapolating from the existing IC2 waste generation rate by GFA for IC3-East and IC3-West, as per below.

TABLE 82: ESTIMATED OPERATIONAL WASTE				
Site element	**IC2**	**IC3-East**	**IC3-West**	**Total**
GFA Office Area	324	169	1,506	1,999
GFA Data Halls	4,454	6,562	7,523	18,539

TABLE 82: ESTIMATED OPERATIONAL WASTE				
Site element	**IC2**	**IC3-East**	**IC3-West**	**Total**
Total GFA	4,778	6,731	9,029	20,538
Estimated waste generation:				
General Waste (L per week)	3,375	4,842	6,457	14,674
Cardboard (L per week)	1,650	2,367	3,157	7,200

At present separation of other non-cardboard recyclable waste is not undertaken. SLR recommends that with the larger facility, recyclable waste generated in the office space within each IC is separated.

The RDCP2014 provides an estimated rate of 10L/100m^2/day to calculate office recyclable waste generation. With the total office space of 1,999m^2 across the campus, this gives an estimate of 200L of recyclable waste per day. This estimate includes cardboard, which accounts for approximately 60% of the office recyclable waste stream. When recalculated, the remaining recyclable waste generation rate is approximately 80L per day or 560L per week.

Using the waste generation rates in **TABLE 82** above, the approximate weekly waste quantities for the project have been calculated, as follows.

TABLE 83: ESTIMATED QUANTITIES OF OPERATIONAL GENERAL WASTE AND RECYCLING FOR THE DATA CENTRE CAMPUS			
Location	**General Waste (L/week)**	**Recycling (General) (L/week)**	**Recycling (Cardboard) (L/week)**
Data centre campus (total)	14,675	560	7,200
Proposed expansion	6,450	420	3,160

In addition to the estimated quantities of waste and recycling listed in **TABLE 83**, the project is anticipated to produce:

- Electronic waste, generated from fit out/decommissioning of individual data centres and associated infrastructure
- Minimal quantities of green landscaping waste
- Other wastes derived from maintenance activities

E-waste generation will vary depending on the nature of data-centre client activities. The Site Manager should ensure there is sufficient storage capacity within the facility to temporarily store e-waste as it is generated. E-waste should be sent for recycling at a suitably licensed facility. The Site Manager should establish a contract for collection and recycling with an e-waste recycling contractor.

To minimise packaging waste generated in the recyclables stream, it is recommended that packing waste is returned to the suppliers where possible. As larger quantities of packaging waste may be campaign sourced (e.g., new fit outs, new client fit out), the site manager should ensure there is sufficient storage for packaging waste prior to it being sent for recycling.

If additional collection services are required, such as secured document destruction, these can be organised with a private waste contractor who can provide additional bins and take collected waste to an off-site licenced facility.

The project is anticipated to produce minimal quantities of garden organics. Less than 100L of garden organics are estimated to be generated per week. This waste will be taken by a landscaping contractor who will dispose of it at an off-site licenced facility.

Waste storage area size:

For the expanded data centre, the waste storage area must be large enough to adequately store all quantities of operational waste and recycling between collections. Given there are two other data

centres at the same address, the size calculation allows for the storage and management of wastes generated from the entire campus.

All waste storage room calculations have considered the bin dimensions listed in RDCP2014, as outlined in **TABLE 84**.

TABLE 84: DIMENSIONS AND APPROXIMATE FOOTPRINT OF BINS

Dimension	Height (mm)	Depth (mm)	Width (mm)	GFA (m^2)
4.5m^3 Front lift General Waste	1,850	1,860	2,050	3.81
4.5m^3 Front lift Cardboard	1,850	1,860	2,050	3.81
660L Rear lift general recycling	1,080	770	1,360	1.05
1100L Rear lift e-Waste bin	1,460	1,230	1,370	1.69

To allow for ready movement of bins into and out of the bin storage area, the bin storage area is to provide a floor area of at least twice the total minimum bin GFA. This can also act as a contingency in the event of spikes in waste generation. Additionally, an additional 0.2m should be allowed between the bins to allow for manoeuvrability. This has been considered in the calculation of the waste storage area for each of the buildings in the project.

The recommended storage areas do not include consideration for the storage of bulky and hazardous waste.

The estimated number of bins required for weekly storage of operational waste and recycling generated by the project are shown in **TABLE 85** and are based on:

- The estimated quantities of operational waste and recycling as shown in **TABLE 83**
- Bin dimensions from the Council's DCP as shown in **TABLE 84**

The estimated number of bins required for weekly storage of operational waste and recycling generated by the project is shown in **TABLE 85**.

TABLE 85: TOTAL RECOMMENDED STORAGE AREA FOR OPERATIONS

Waste type	Bin required	Collection frequency	Storage area size (m^2)
General waste	1 x 4.5m^3 Front lift general	4 x weekly	8
General recycling	1 x 660L Rear lift	1 x weekly	2
Cardboard	1 x 4.5m^3 Front lift general	2 x weekly	7
Electronic waste	1 x 1100L	As required	4
Bulky waste	-	As required	8
		Total	**29**

As outlined in the RDCP2014, additional storage space for the bulky waste stream must be provided. This stream includes broken pallets, broken storage units, bulky e-waste and other materials that cannot be disposed of in the general or recyclable waste stream. SLR recommends that the site has a specific bin for e-waste to be collected and has allowed for a 1,100-litre bin to be stored within the waste storage area.

Council's guidelines do not provide storage area dimensions for bulky waste. In the absence of dimensions provided by Council, SLR has adopted storage area dimensions for bulky waste presented in The City of Sydney's Guidelines for Waste Management in New Developments. These are applied as they are the most recent recommendations for bulky waste storage that have been provided in guidelines for new developments in NSW and are applicable to non-residential developments. The recommended space for storing bulky wastes should be at least:

- 4m^2 for developments between 100m^2 and 2,000m^2, and
- An additional 4m^2 for developments over 2,000m^2 and for every 20,000m^2 of office space.

SLR recommends 8m^2 to be allocated for bulky waste storage. The total recommended waste storage area is 29m^2.

Management may consider organising a skip on a monthly basis or as required to remove bulky waste items or engage a contractor to collect and transport these items for reuse, recycling, or disposal at an EPA licensed facility. The Site Manager should consider the need for a separate e-waste bin should depending on need.

Waste storage areas for the proposal are in line with Council's requirements. The following schematic diagram shows the proposed location and configuration of the waste storage room, including bulky waste.

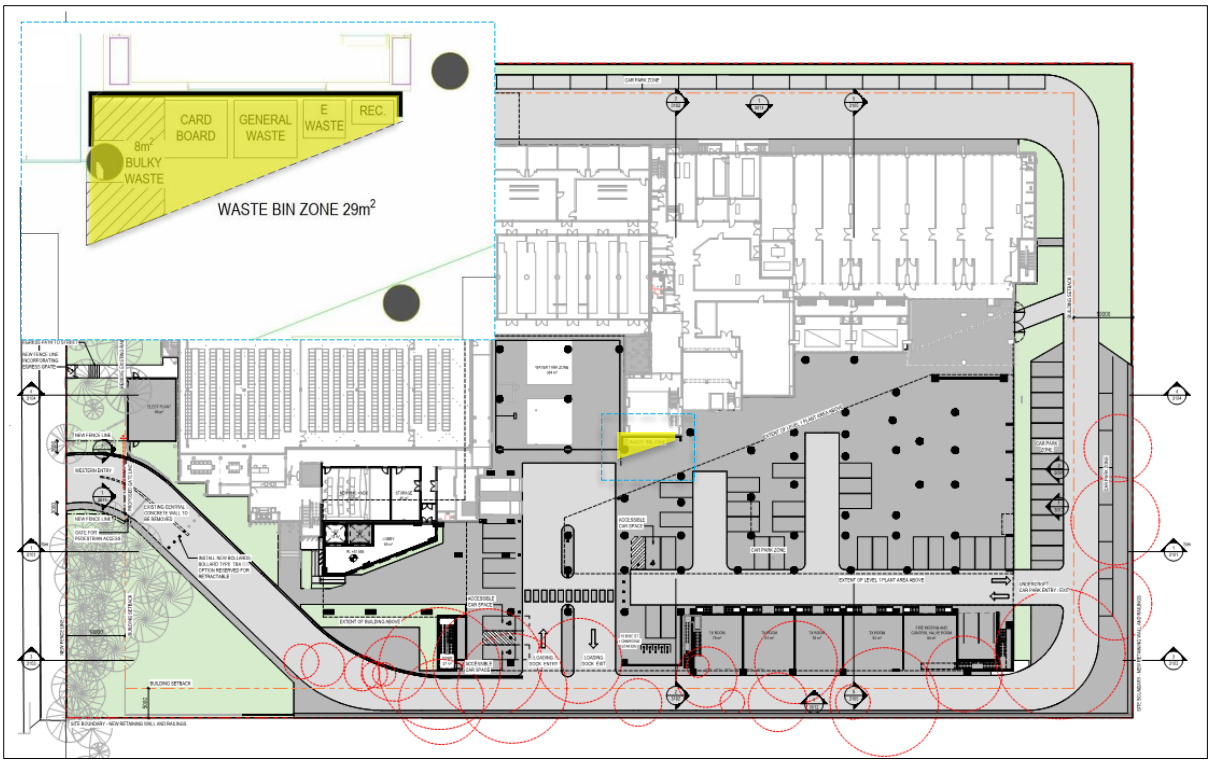


Figure 72 Schematic showing indicative waste storage room layout (Source: SLR, 2021)

SLR recommends that waste audits be undertaken approximately one month into the operational phase of the Project to quantify actual waste generation rates. The assessment of generated waste quantities will be influenced by management, employee, and tenant attitudes to recycling and disposal, and the adequacy of signage and education provided for occupants.

6.1.20 Planning agreement/development contributions

This section of the EIS evaluates the relevant planning agreement/development contributions associated with the proposed development, as required by the SEARs and addresses the following specific matters:

- ***demonstration that satisfactory arrangements have been or would be made to provide, or contribute to the provision of, necessary local and regional infrastructure required to support the development, in accordance with the relevant Council Plan/s.***

Discussion have been ongoing with the City of Ryde Council regarding the provision of a VPA under the subject SSD Application. To invoke the provisions under Clause 6.9 of RLEP2014 and achieve a 45 m height limit, MDC propose to enter into a VPA with the City of Ryde Council.

It is noted that a VPA was executed under LDA2018/0322 between the abovementioned parties, and any new VPA for the subject SSD would seek to obtain a credit where there have already been monies paid relevant to the proposal. The monetary rate would be in the order of $275 per square metre and MDC may also seek to pay Section 7.11 contributions as part of any new VPA.

The terms of the VPA and the draft offer are yet to be finalised. Any future arrangement regarding this matter will be documented and reported to NSW DPIE as part of the SSD assessment process.

PART G PLANNED MANAGEMENT AND MITIGATION MEASURES FOR THE PROPOSED DEVELOPMENT

By:	Macquarie Data Centres
In relation to:	State Significant Development Application (SSD-24299707) For Talavera Road Data Centre Campus Expansion
Site:	17 – 23 Talavera Road, Macquarie Park Lot 527 DP 752035

Macquarie Data Centres (MDC), plan to undertake the construction and operation of the proposed data centre, in accordance with the following subsections.

PLANNED MANAGEMENT AND MITIGATION MEASURES FOR SSD-24299707		
ID	**Management / Mitigation Measure**	**Timing**
Administrative Commitments		
A1	**Commitment to Minimise Harm to the Environment** MDC will commit to implement all reasonable and feasible measures, to prevent and/or minimise any harm to the environment, that may result from the construction or operation of the proposed development	Prior to construction, during construction, and during operation.
A2	**Terms of Approval** MDC would carry out the project generally in accordance with the: (a) Environmental Impact Statement; (b) Drawings; (c) Management and Mitigation Measures; (d) Any Conditions of Approval. If there is any inconsistency between the above, the Conditions of Approval shall prevail to the extent of the inconsistency.	Prior to construction, during construction, and during operation.
A3	**Occupation Certificate** MDC would ensure that Occupation Certificates are obtained prior to the occupation of the facilities.	Prior to operation.
A4	**Compliance** MDC would ensure compliance with any reasonable requirement(s) of the Secretary of the DPIE arising from the assessment of: (a) Any reports, plans, programs, strategies or correspondence that are submitted in relation to this Approval; and (b) The implementation of any recommended actions or measures contained in reports, plans, programs, strategies or correspondence submitted by the Project Team as part of the application for Approval.	Prior to construction, during construction, and during operation.
A5	**Structural Adequacy** MDC would ensure that all new buildings and structures on the site are constructed in accordance with the relevant requirements of the National Construction Code.	During construction.
A6	**Construction Environmental Management Plan** Prior to the commencement of construction, MDC would prepare a Construction Environmental Management Plan (CEMP) that addresses the following: (a) Air Quality; (b) Noise and Vibration;	Prior to construction.

PLANNED MANAGEMENT AND MITIGATION MEASURES FOR SSD-24299707		
ID	**Management / Mitigation Measure**	**Timing**
	(c) Waste Classification; (d) Erosion and Sediment Control; (e) Materials Management Plan; and (f) Community Consultation and Complaints Handling.	
A7	**Site Induction** All staff employed on the site by the construction contractor would be required to undergo a site induction.	Prior to construction.
A8	**Operation of Plant and Equipment** MDC would ensure that all plant and equipment used on-site, is maintained and operated in proper and efficient manner, and in accordance with relevant Australian Standards.	During operation.
A9	**Monitoring the State of Roadways** MDC would monitor the state of roadways leading to and from the subject site, during construction, and will take all necessary steps to clean up any adversely impacted road pavements as directed by the City of Ryde Council.	During construction.
A10	**Waste Receipts** MDC would ensure that a permanent record of receipts, for the removal of both liquid and solid waste from the subject site, be kept and maintained up to date at all times. Such records would be made available to authorised person upon request.	During construction and operation.
A11	**Complaints Handling** MDC would prepare an Operational Complaints Handling Protocol for the development, prior to the commencement of operations.	Prior to operation.
Specific Environmental Commitments		
Noise and Vibration		
NV1	During construction, MDC is committed to: ▪ The use of less noisy plant and equipment, where feasible and reasonable. ▪ Proper maintenance of plant and equipment. ▪ Providing special attention to the use and maintenance of 'noise control' or 'silencing' kits fitted to machines to ensure they perform as intended. ▪ Strategically positioning plant on site to reduce the emission of noise to the surrounding neighbourhood and to site personnel. ▪ Avoiding any unnecessary noise when carrying out manual operations and when operating plant. ▪ Switching off any equipment not in use for extended periods during construction work. ▪ Limiting/avoiding, where possible, the simultaneous operation of noisy plant within discernible range of a sensitive receiver. ▪ Maximising, where practical, the offset distance between noisy plant and adjacent sensitive receivers. ▪ Where practical, plant that is used intermittently is to be throttled down or shut down when not in use.	During construction.

PLANNED MANAGEMENT AND MITIGATION MEASURES FOR SSD-24299707		
ID	**Management / Mitigation Measure**	**Timing**
	▪ Direct noise-emitting plant away from sensitive receivers, where possible. ▪ Staging of construction works so as to erect solid external walls first and utilising them to provide noise shielding to the noise sensitive receivers. However, the structural integrity of the external walls should be investigated prior to implementing this measure and should be prioritised over the noise benefits.	
NV2	In addition to the noise mitigation measures outlined above, a management procedure will need to be put in place to deal with noise complaints that may arise from construction activities. Each complaint will need to be investigated and appropriate noise amelioration measures put in place to mitigate future occurrences, where the noise in question is in excess of allowable limits.	Prior to construction.
NV3	MDC would consult with nearby stakeholders prior to commencing construction and throughout the construction phase, to keep them informed of progress and allow for feedback to be received on any complaints.	Prior to and during construction.
NV4	Noise monitoring would be carried out during the construction phase, in line with recommendations, as required.	During construction.
NV5	Construction noise and vibration management would form part of the CEMP, to be prepared for the project, as outlined in **A6**.	Prior to construction.
NV6	Where construction activity is to occur in close proximity to sensitive receivers, vibration testing of actual equipment would be carried out prior to their commencement of site operation, to determine site-specific acceptable buffer distances to the nearest affected receiver locations.	Prior to construction.
NV7	MDC would prepare an Operational Noise Management Plan, in line with the recommendations of the Noise and Vibration Report TM162 - 01F02 (Renzo Tonin & Associates, November 2021).	Prior to operation.
Air Quality		
AQ1	Air quality mitigation and monitoring would form part of the CEMP, to be prepared for the project, as outlined in **A6**.	Prior to construction.
Traffic and Transport		
TT1	MDC would ensure that a Construction Traffic Management Plan (CTMP) is prepared and submitted to DPIE. This plan would: (a) be submitted to the Secretary for approval prior to the commencement of construction; (b) describe the traffic volumes and movements to occur during construction; (c) detail proposed measures to minimise the impact of construction traffic on the surrounding network, including driver behaviour and vehicle maintenance; and, (d) detail the procedures to be implemented in the event of a complaint from the public regarding construction traffic.	Prior to construction.

PLANNED MANAGEMENT AND MITIGATION MEASURES FOR SSD-24299707		
ID	**Management / Mitigation Measure**	**Timing**
TT2	A site specific Traffic Control Plan (TCP) would be prepared in accordance with TfNSW's *Traffic Control at Work Sites Manual* once detailed construction staging is completed post-approval and if the vehicle haulage routes that utilises manoeuvres with traffic control are required.	Prior to construction.
TT3	A Site Supervisor would check all relevant traffic control management measures are in place prior to commencement of works.	Prior to construction.
TT4	MDC would prepare a Workplace Travel Plan.	Prior to operation.
Hazards & Risks		
HR1	MDC would notify Safework NSW of the proposed storage of diesel fuel and lithium ion batteries.	Prior to operation.
HR2	MDC would ensure that the storage of combustible and flammable liquids shall be in accordance with Australian Standard *AS1940 Flammable Liquids Storage and Handling*.	During operation.
HR3	An emergency management plan (EMP) would be prepared in accordance with AS2745:2010. The EMP shall incorporate first attack firefighting training for Emergency Planning Committee and Emergency Control Organisation members and emergency procedures which reinforce containment of fires only where safe to do so.	Prior to operation.
Cultural Heritage		
H1	An Unexpected Finds Policy would be developed, in the unlikely event that relics are identified during ground disturbing works.	Prior to construction.
H2	Unexpected Aboriginal objects remain protected by the National Parks and Wildlife Act 1974. If any such objects, or potential objects, are uncovered in the course of the activity, all work in the vicinity would cease immediately. A qualified archaeologist would be contacted to assess the find and Heritage NSW and Metropolitan Local Aboriginal Land Council would be notified.	During construction.
H3	If human remains, or suspected human remains, are found in the course of the activity, all work in the vicinity would cease, the site would be secured, and the NSW Police and Heritage NSW would be notified	During construction.
H4	All relevant staff, contractors and subcontractors would be made aware of their statutory obligations for heritage under the NSW *Heritage Act 1977* and best practice as outlined in *The Burra Charter 2013*, during site inductions.	Prior to construction.
H5	Consultation with the registered Aboriginal parties would continue.	Prior to and during construction.
Socio-Economic		
SE1	MDC would notify surrounding businesses and residents one (1) week before commencement of construction activities. Notices should include: ▪ Details of the proposal, including contact details of management team ▪ Hours and expected period of construction ▪ Details regarding process should businesses or residents have concerns, questions or complaints	Prior to construction.

PLANNED MANAGEMENT AND MITIGATION MEASURES FOR SSD-24299707		
ID	**Management / Mitigation Measure**	**Timing**
SE2	MDC would set up a feedback process to manage and respond to stakeholder concerns, questions, or complaints. MDC would ensure that this process is clear and accessible to stakeholders such as surrounding businesses and residents.	Prior to and during construction.
SE3	MDC would prioritise engaging with local businesses, where practicable, e.g. site induction for visiting workers to include profile of surrounding food and beverage retailer.	During construction.
Waste Management		
WM1	Effective management of construction materials and construction and demolition waste, including options for reuse and recycling where applicable and practicable, would be conducted. Only wastes that cannot be cost effectively reused or recycled would be sent to landfill or appropriate disposal facilities.	During construction.
WM2	Waste materials produced from site preparation and construction activities would be separated at the source and stored separately on-site.	During construction.
WM3	The Site Manager or equivalent role would: ▪ Arrange for suitable waste collection contractors to remove any construction waste from site ▪ Ensure waste bins are not filled beyond recommended filling levels ▪ Ensure that all bins and loads of waste materials leaving site are covered ▪ Maintain waste disposal documentation detailing, at a minimum: o Descriptions and estimated amounts of all waste materials removed from site o Details of the waste and recycling collection contractors and facilities receiving the waste and o recyclables o Records of waste and recycling collection vehicle movements, for example, date and time of loads o removed, licence plate of collection vehicles, tip dockets from receiving facility, and o Waste classification documentation for materials disposed to off-site recycling or landfill facilities. ▪ Ensure lawful waste disposal records are readily accessible for inspection by regulatory authorities such as Council, SafeWork NSW or NSW EPA, and ▪ Remove waste during hours approved by Council.	During construction.
WM4	Site inductions, as required under **A7** would ensure the following training is covered: ▪ Legal obligations and targets ▪ Emergency response procedures on-site ▪ Waste priorities and opportunities for reduction, reuse, and recycling ▪ Waste storage locations and separation of waste ▪ Procedures for suspected contaminated and hazardous wastes ▪ Waste related signage ▪ The implications of poor waste management practices, and	Prior to construction.

PLANNED MANAGEMENT AND MITIGATION MEASURES FOR SSD-24299707		
ID	**Management / Mitigation Measure**	**Timing**
	▪ Responsibilities and reporting, including identification of personnel responsible for waste management and individual responsibilities.	
WM5	The following monitoring practices would be undertaken to improve site preparation and construction waste management and to obtain accurate waste generation figures: ▪ Conduct waste audits of current projects where feasible. ▪ Note waste generated and disposal methods. ▪ Look at past waste disposal receipts. ▪ Record this information to track waste avoidance, reuse, and recycling performance and to help in waste estimations for future waste management plans.	During construction.
WM6	Waste audits would be undertaken approximately one (1) month into the operational phase of the project to quantify actual waste generation rates.	During operation.
WM7	Waste avoidance, reuse and recycling measures would implemented throughout the life of the project, where possible.	During operation.
WM8	Monitoring would be undertaken by MDC to ensure waste and recycling management arrangements and provisions for the project are functional, practical and are maintained to the standard outlined in this plan, at a minimum.	During operation.
WM9	Visual assessments of bins and bin storage areas would be conducted by the Building Manager, at minimum: ▪ Weekly, in the first two months of operation to ensure the waste management system is sufficient for the operation, and ▪ Every six months, to ensure waste is being managed to the standards outlined in this document.	During operation.
WM10	Audits would be conducted on a half-yearly basis to ensure waste management provisions are maintained. Quantities of waste and recycling associated with disposal of waste and recycling, including dockets, receipts and other physical records would be recorded by the Building Manager. This would allow reviews of the waste management arrangements and provisions at the site over time. Records of waste disposal would also be available to regulatory authorities such as the NSW Environmental Protection Authority and SafeWork NSW, upon request.	During operation.
Tree Protection		
TP1	Trees to be retained on site must be protected in accordance with AS4970-2009.	During construction.

PART H PROPOSED DEVELOPMENT JUSTIFICATION

8.1 JUSTIFICATION

The proposed development is justified on environmental, social and economic grounds and is compatible with the locality in which it is proposed. The proposed development would enhance the subject site from an otherwise vacant landholding to a productive employment generating facility.

This EIS is submitted on the following basis.

8.1.1 Supports State, Regional and Local Planning Objectives

The proposed development is consistent with the objectives, provisions and vision contained within *A Metropolis of Three Cities – Greater Sydney Region Plan*; the *North District Plan*; and RLEP2014. The proposal would contribute to employment generation in an area already earmarked for employment through both State and Regional planning policies.

The need for data centres was given a burning platform by changes to business as usual catalysed by COVID-19. The NSW DPIE recognises data centres as a type of development 'well-placed' to support short-term economic recovery from COVID-19. Data centres were included as one infrastructure asset encouraging investment and job-generating development in DPIE's Productivity Acceleration Package. This relative importance is reflected in amendments to the SRD SEPP, which temporarily allows greater scope for warehouses and data centres to be assessed as SSD.

8.1.2 Demonstrates an Appropriate Use of a Permissible Development

The proposed development would retain and contribute to the growth of Macquarie Park Corridor and the wider region. The proposed development would be a highly appropriate and compatible (given its contiguousness to other existing operations) response to the strategic goals and objectives of the whole region as set out in *A Metropolis of Three Cities – Greater Sydney Region Plan* and the *North District Plan*. These documents all envisage employment-generating land uses at this location.

The proposed development is an expansion to the existing data centre, co-located with an existing facility that is demonstrated to operate consistent with character of local area. The expansion would further support the secure operation of business to business and business to consumer services, helping provide employment-generating opportunities in the professional services, start-up and creative industries in the City of Ryde LGA, the Macquarie Park Innovation District and the Eastern Economic Corridor. If additional data supply is not provided in well suited locations, additional pressure would be placed on cloud-based storage capacity, limiting the capability of digital transformation in economy.

The proposed development would assist in providing new employment opportunities (directly and indirectly), through the promotion of further industry diversification in regional growth industry sectors (i.e. ICT sector). Accordingly, this proposal would not alter the quantity or configuration of land currently zoned for commercial-related uses pursuant to the B7 Business Park zone under RLEP2014. Rather, the proposed development would represent a logical extension to the existing data centre approved at the subject site, under LDA2018/0322. The proposal would support the retention and maintenance of existing commercial land stocks and employment objectives, whilst promoting land use diversification (and generating new employment sources), and would generate more employment through the relevant planning, construction, operational and maintenance stages.

8.1.3 Minimises Environmental Impacts

Specialist consultants have assessed the potential impacts of the proposed development, determining that it could be undertaken with minimal environmental impacts. The commissioned reports (also as listed in **TABLE 2**) have collectively concluded that no significant risk to the locality would result from the proposed development. Where impacts have been identified, these fully-developed strategies are set out in detail for management and mitigation. These measures are described in **PART F** of this EIS.

8.1.4 Creates Compatibility with Surrounding Development

The proposed development is compatible with existing land uses on adjacent lands, all of which provide very similar employment-generating functions. All are within the immediate vicinity of the proposed development. Detailed investigations undertaken, as part of this application, conclude that no significant environmental cumulative impacts, would occur from the proposed facility.

8.1.5 Delivers Ecologically Sustainable Development

The principles of ESD as outlined in Clause 7(4) of the EP&A Regulation have been carefully considered in the formulation of this proposal and are addressed as follows:

8.1.5.1 Precautionary Principle

After careful assessment by both the project team and expert consultants, it is concluded that no unmanageable threat or irreversible damage to the environment, would result from the proposed development.

8.1.5.2 Inter-generational Equity

The project team and expert consultants have examined the overall effects of the proposed development, on both the natural environment and the existing built environment within the vicinity of the subject site.

This detailed assessment has concluded that no unreasonable use of resources, affectation of environmental processes or prevention of the use of land for future generations would occur from the proposed development. The proposed development would improve the status of the subject site and contribute to the economies of the region through both substantial investment and new employment, thereby improving the inter-generational equity.

8.1.5.3 Improved Valuation, Pricing and Incentive Mechanisms

Increasing the capacity and capability of secure data storage and cloud-based infrastructure is of regional, state and national significance. The events of recent times have radically shaped the way people live and work. From wild weather events, to geopolitical tensions, a global pandemic and the resulting move to online business. These macro-economic forces have created challenging conditions for many enterprises. Traditional business models are being pushed aside and how a company responds will determine its future – adapt and survive or resist and fold.

The provision of data storage provides a platform for a competitive digital economy, with increased capacity creating the conditions for multinationals to enter the Australian market. CBRE (2020) *CBRE Research: Asia Pacific Data Centre Trends H1 2020* identifies Sydney is one of four tier one data centre markets in the in Asia-Pacific, recording the strongest growth in IT capacity in the Asia Pacific region in the last financial year – an increase of 76%. This is significantly greater than comparable cities such as Singapore (14%) and Hong Kong (27%).

Importantly, the proposed development would provide data storage solutions for both public and private cloud, not just public cloud. This enables the proposal to support services for multinational corporations that require their own private hosting solutions, as well as Tier 1 Government agencies. Emerging digital technology (including cybersecurity, AI and quantum computing) is a priority industry to achieve Global NSW's vision for a globally connected, smart and vibrant economy.

Further, the NSW Government has states that 'each data centre development directly contributes as much as $1 billion in construction and fit-out costs to the NSW economy and forms critical infrastructure for the IT sector', emphasising the importance of these investments towards economic stimulus.

The proposal also offers a total investment value of $ 289,731,682.00 (excluding GST).

8.1.5.4 Environmental Management

The proposed development implements significant and elaborate measures that avoid, contain and address any possible flooding, air-quality, noise, waste and pollution impacts, through avoidance, better design and management. This is exemplified through the measures, which would be implemented throughout both the construction and operational phases of the proposed development, outlined within **PART F** and **PART G** of this EIS.

PART I CONCLUSION

This proposed development is deemed to SSD pursuant to Schedule 1, item 25 of SRD SEPP. This EIS has been prepared in accordance with the SEARs.

The proposed development is considered to be entirely consistent with the Objects of the EP&A Act under Section 1.3, particularly the notion of promoting the orderly and economic development of the land.

Based on the specialist studies and extensive investigations carried out for the proposed development, the following conclusions are made:

1. **Strategic and Statutory Context** – The proposal aligns with the strategic planning framework, namely *A Metropolis of Three Cities* and the *North District Plan*. Consistency is achieved through:

    - N8: Eastern Economic Corridor is better connected and more competitive: The Eastern Economic Corridor extends from Macquarie Park to Sydney Airport, containing close to a third of Greater Sydney's jobs. The proposal would contribute to further job creation in this respect.
    - N9: Growing and investing in health and education precincts: The proposed data centre expansion at the subject site supports the growth of the Macquarie Park Corridor, which is intended as a hospital and high-tech industrial employment hub.
    - N10: Growing investment, business opportunities and jobs in strategic centres: The proposed data centre expansion supports improved access to jobs, goods and services in the Macquarie Park strategic centre.
    - N13: Supporting growth of targeted industry sectors: Increased data storage capacity would enable economic opportunities created by changing technologies, embracing opportunities to expand start-up and digital innovation that can allow people to work closer to home.

    In terms of the statutory context, the proposal is entirely consistent with the Objects of the EP&A Act. The appropriateness of the proposed development is also demonstrated through compliance with the ISEPP, SRD SEPP and RLEP2014 in that it achieves the employment generating outcomes envisaged for the subject site with minimal impact on surrounding land uses.

2. **Suitability of the Site** – The subject site is highly suitable for the proposed development, as it is directly adjacent to the existing data centre. It also presents a suitable platform for development in that it is flat, is located within close proximity of key infrastructure and has limited environmental constraints.

3. **Community and Stakeholder Engagement** – This EIS and supporting reports have been prepared in accordance with the matters prescribed by the SEARs. A comprehensive level of community and stakeholder engagement has been undertaken for the proposed development.

4. **Noise and Vibration** – The acoustic assessment carried out by Renzo Tonin & Associates has quantified construction and operational noise emissions from the proposed development and has assessed noise at the nearest sensitive receivers. Based on the assumptions and inputs the assessment, it has been established that operation of the site is capable of complying with relevant EPA and Council noise emission requirements.

5. **Air Quality and Odour** – Based upon the assumptions presented in the AQIA and the implementation of the recommended mitigation methods, the site is assessed as being capable to not give rise to significant air quality and odour impacts during the construction and operational phases associated with the proposal.

6. **Traffic and Transport** – Sufficient access and parking arrangements are provided as part of the proposed development, ensuring that there would be no undue impact on the surrounding road network.

7. **Hazards and Risks** – The storage of DGs has been analysed, and it is concluded that the risks at the site boundary are not considered to exceed the acceptable risk criteria; hence, the

facility would only be classified as potentially hazardous and would be permitted within the current land zoning for the site.

8. **Infrastructure Requirements** – The proposed development seeks to ensure that future planned infrastructure can be accommodated to support the proposed and future development.

9. **Soils and Water** – The proposed development is supportable based on soil and water investigations and management methodologies.

10. **Flood risk** – The proposed development is not expected to have a significant adverse impact on the subject site or in adjacent properties.

11. **Urban Design and Visual** – As clearly demonstrated in the submitted Architectural Plans and Visual Impact Analysis the proposed development provides a suitable urban design outcome that reflects the existing locality.

12. **Ecologically Sustainable Development** – The proposed development would aim to achieve a high Green Star Rating by applying ESD principles.

13. **Greenhouse Gas and Energy Efficiency** – Through the implementation of the initiatives noted within this statement the project clearly demonstrates the commitment to ESD principles and reduction of GHG emissions throughout the design, construction, and operation.

14. **Biodiversity** – A BDAR wavier has been granted.

15. **Aboriginal cultural heritage** – There are no recorded Aboriginal sites, nor have any areas of Aboriginal archaeological sensitivity been identified within the subject site.

16. **Non-Aboriginal cultural heritage** – The proposal does not involve works that would impact a listed heritage item, and there is low potential that significant archaeological remains are present within the subject site.

17. **Socio-economic** – Long term socio-economic impacts of the proposal are expected to be positive, with benefits to be felt by groups extending beyond the immediate study area, through the enhanced digital connectivity and broad economic benefits realised in operation.

18. **Waste** – A Waste Minimisation and Management Plan has been provided, which considers construction and operational waste measures to be undertaken for the proposed development. All buildings have considered the provision for waste management areas to ensure the effective management and disposal of waste can occur.

19. **Planning agreement / Development contributions** – The applicant seeks to enter into a VPA with the City of Ryde Council to invoke the incentive height provisions under Clause 6.9 of the RLEP2014. Discussions have been ongoing with the City of Ryde Council and the terms and draft offer of the VPA are yet to be finalised. Any future arrangement regarding this matter will be documented and reported to NSW DPIE as part of the SSD assessment process.

Based on the findings of this EIS, it is concluded that the proposed development would support the continued and targeted growth of the digital economy. The proposal would contribute to the retention and growth of the Macquarie Park Corridor. The proposed development is therefore considered suitable from both a local and regional context and is considered orderly and appropriate, based on social, cultural, economic and environmental matters.

Given the above reasons and the satisfaction of both of the Objects of the EP&A Act and the aims of ISEPP and RLEP2014, it is recommended that the proposed development, for the purposes of a data centre, be supported subject to relevant and reasonable condition.