MACQUARIE DATA CENTRE

Waste Management Plan

Prepared for:

GIDDIS Project Management
64a Irrubel Rd
Newport NSW 2106

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BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with GIDDIS Project Management (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
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EXECUTIVE SUMMARY

This Waste Management Plan (WMP) has been prepared by SLR Consulting on behalf of Macquarie Data Centres (MDC) care of GIDDIS Project Management. The WMP has been produced to support the Environmental Impact Statement (EIS) prepared by Willowtree Planning PTY Ltd (Willowtree Planning).

The EIS has been submitted to the New South Wales 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 earthworks, provision of infrastructure and 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 (LDA/2018/0322) to allow for additional data storage capacity at the subject site, improving the overall operational efficiencies and provision of technology services to customers and the wider locality.

The proposal comprises:

- a seven storey building plus ground floor
- ancillary office space and staff amenities
- a back-up power system
- associated infrastructure, car parking, loading docks and landscaping.

The subject site is located within the City of Ryde. The proposal seeks to operate 24 hours per day, seven days per week.

The particulars of this proposal are summarised below:

- Minor earthworks involving cut and fill works
- Infrastructure comprising civil works and utilities servicing
- Construction of a seven storey building plus ground floor extension, comprising up to:
  - 15 data halls
  - 20 back-up generators
  - Fitout of the building for use as a data centre as needed.

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1 Introduction

SLR Consulting Australia Pty Ltd (SLR) has been appointed by Macquarie Data Centres (MDC) to prepare a waste minimisation and management plan (WMMP) for the proposed Macquarie Park Data Centre at 17-23 Talavera Road, Macquarie Park, to support the State Significant Development Application (SSDA) for the proposed development.

1.1 Site Description

The site is described as Lot 527 DP 752035 and has a total area of about 20,000 m^2, with access from Talavera Road.

The site forms part of the Macquarie Park Corridor, which is the strategic centre of Macquarie Park, a health and education precinct and an important economic and employment powerhouse in Sydney's north. The site is described through its current commercial setting as an existing data centre (LDA/2018/0322), adjoining surrounding commercial premises along Talavera Road.

The site is situated approximately 12.5 km northwest of the Sydney CBD and 11.3 km northeast of Parramatta. It is in proximity to transport infrastructure routes, predominantly 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 in proximity to active transport links, such as bicycle routes, providing an additional mode of accessible transport available to the subject site.

The site location is shown in Figure 1 below.

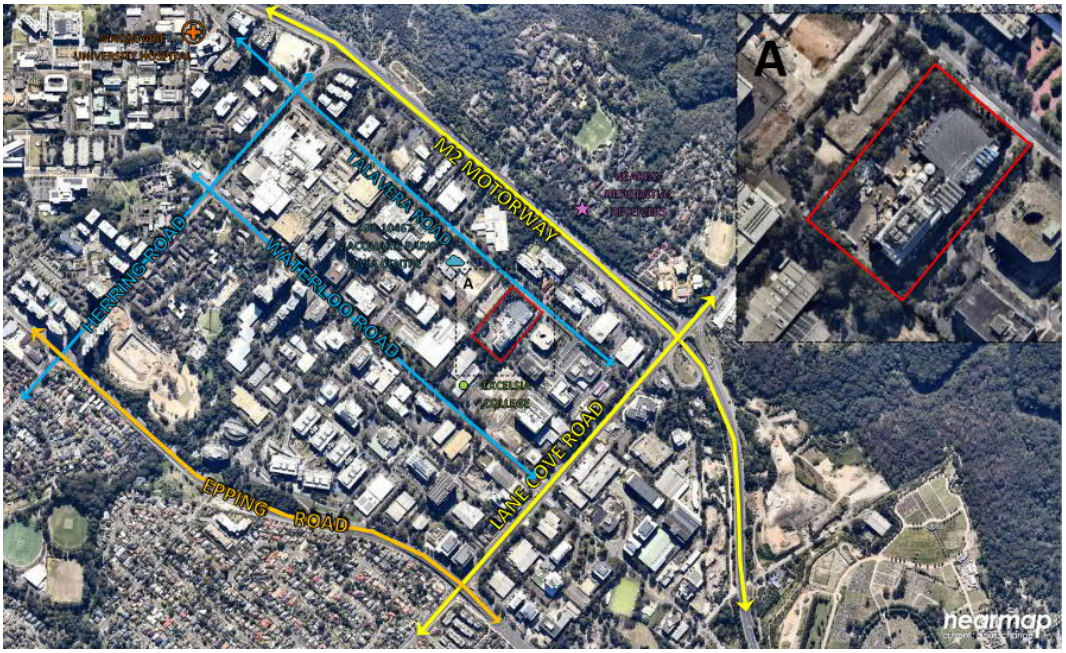


Figure 1 Site location

1.2 Secretary's Environmental Assessment Requirements

This waste management plan is prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs). The SEARs for the proposal outline key issues to be addressed as part of this EIS and includes waste management as shown in Table 1.

Table 1 SEARs

SEARs Items	Secretary's Environmental Assessment Requirements	Response
Waste	- Details of the quantities and classification of all waste streams to be generated on site during the construction and operation of the development	See Section 5.2 and 5.4 for construction waste and Sections 6.2 and 6.3 operational waste.
	- Details of waste storage, handling and disposal during the construction and operation of the development, including plans of waste storage and collection areas	See Section 5.7 for construction waste and Sections 6.4 and 6.7 for operational waste
	- 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.[1]	See Section 4, as well as Section 5.1 for construction waste and Section 6.1 for operational waste

1.3 Objectives

This WMMP applies to the waste generated from the site preparation, construction and operational stages of the Development and has been prepared using architectural drawings supplied by the Client and attached in Appendix A.

Part 7.2 – Waste Minimisation and Management of the City of Ryde Council Development Control Plan has specific requirements for applicants relating to waste minimisation and management. All applications for development must be accompanied by a site waste minimisation and management plan. This report was prepared in accordance with these requirements

The principal objective of this WMMP is to identify all potential waste likely to be generated at the Development site during the site preparation, construction, and operational phases, including a description of how waste would be handled, processed, and disposed of, or re-used or recycled, in accordance with the SEARs and guided by the City of Ryde's (Council) requirements.

The specific objectives of this WMMP are as follows:

- To encourage the minimisation of waste production and maximisation of resource recovery.
- To ensure the appropriate management of contaminated and hazardous waste.
- To assist in ensuring that any environmental impacts during the operational life of the Development comply with the SEARs, Council's requirements and those of other relevant regulatory authorities.

[1] The NSW Waste Avoidance and Resource Recovery Strategy 2014-2021 was replaced in mid-2021 with the NSW Waste and Sustainable Materials Strategy 2021-2027. Both documents are addressed in this WMMP

1.4 Review of WMMP

This WMMP should be reviewed and updated:

- To remain consistent with waste and landfill regulations and guidelines
- If changes are made to site waste and recycling management, or
- To take advantage of new technologies, innovations and methodologies for waste or recycling management.

Copies of the original WMMP and its future versions should be retained by the building manager. Changes made to the WMMP, as well as the reasons for the changes made, should be documented by the building manager as part of the review process.

2 Project description

2.1 Overview of proposed development

The proposed development comprises the construction of the IC3 Super West Data Centre and activities to fit out the building for use as a data centre. The proposal includes ancillary office space, car and truck parking, landscaping and signage.

The proposal does not require clearing or supporting infrastructure for the IC3e Data Centre which is already approved and is already under construction. The gross floor area of the overall data centre campus is summarised in Table 2 below. Please note that circulation areas are not included.

Table 2 Gross Floor Area – Macquarie Park Data Centre Campus

Building	Type	Gross Floor Area (m^2)
IC2 (Existing)	Office	324
	Data Room	4,454
IC3e (Existing)	Office	169
	Data room	6,562
IC3w (Proposed)	Office	1361
	Data hall	9377
	Office/Data Hall Storage	1448
TOTAL GFA		23,695

2.2 Overview of proposed construction activities

Project works for are expected to include site preparation and construction activities. The site currently is predominantly car parking, access road and a small area of landscaping. The proposed IC3w project will add an additional 16,142 m^2 GFA over seven levels.

A site plan for the Development is shown in Figure 2 and Appendix A.

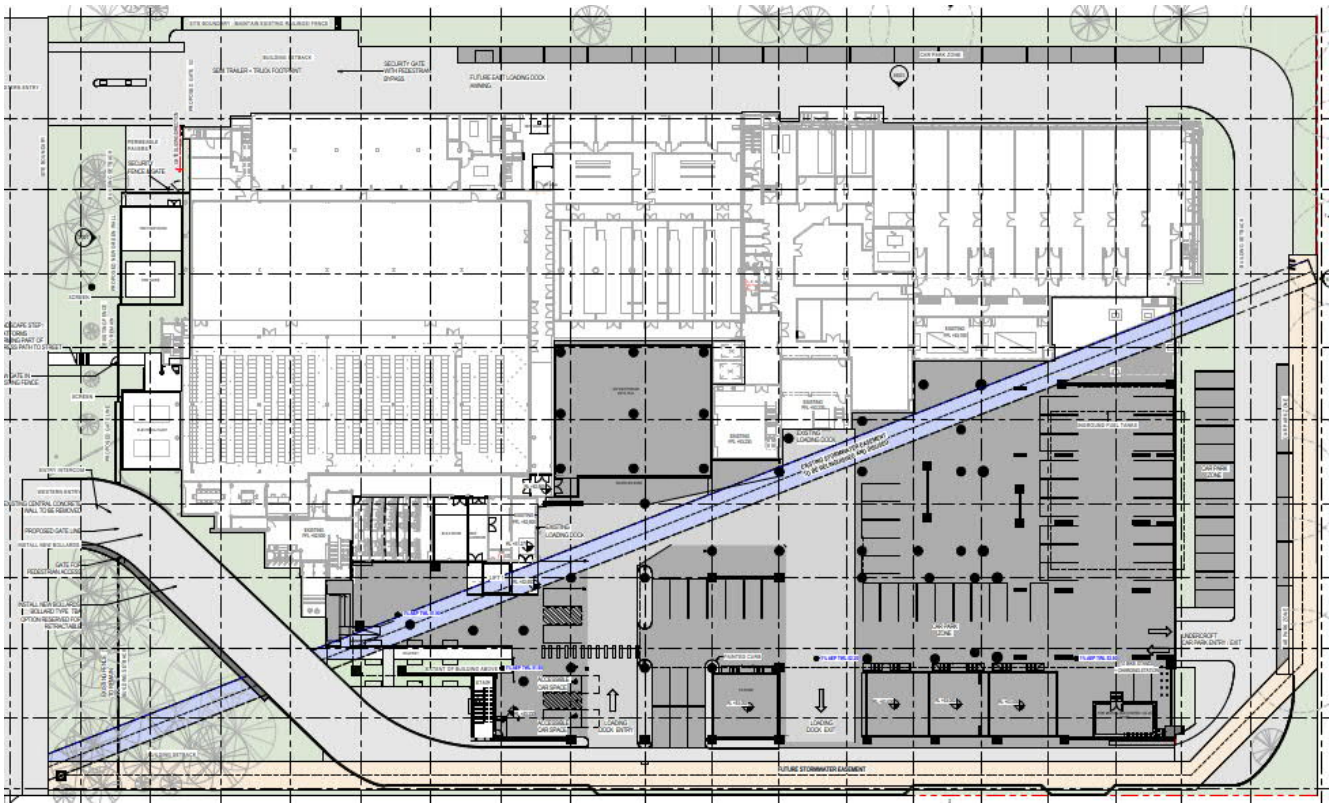


Figure 2 Site Plan

The anticipated construction works for this development include the following:

- Earthworks, excavation and retaining walls
- Construction of the Development, comprising:
  - A ground floor consisting of car parking, loading docks, electrical plant rooms, fire tank and misting control valves.
  - Construction of the main building and façade, comprising seven levels and 9,377 m^2 of data halls
- Fit out of all data halls in a staged manner based on need.

2.1 Overview of proposed operations

The IC3w Data Centre will provide additional data storage capacity in addition to the existing IC2 and IC3e Data Centres. The site will operate 24 hours a day, seven days per week. Articulated and non-articulated trucks would be required to access the site from time to time.

The combined three data centres (IC2, IC3e and the proposed IC3w) will accommodate up to 49 additional staff on site during peak periods. The Development is expected to retain the provision for four loading docks suitable for vehicles up to and including an 8.8 m medium rigid vehicle. This is consistent with the already approved IC3e.

3 Better practice waste management and recycling

3.1 Waste management hierarchy

This WMMP has been prepared in line with the waste management hierarchy shown in Figure 3, which summarises the objectives of the Waste Avoidance and Resource Recovery Act 2001. It is noted that the NSW Government recently released the NSW Waste and Sustainable Materials Strategy 2041 which sets a pathway to increase resource recovery performance, including a transition towards a more circular economy. The waste management hierarchy is still considered highly relevant.

The waste management hierarchy comprises the following principles, from most to least preferable:

- Waste avoidance, prevention, or reduction of waste generation. Achievable through better design and purchasing choices.
- Waste reuse, reuse without substantially changing the form of the waste.
- Waste recycling, treatment of waste that is no longer usable in its current form to produce new products.
- Energy recovery, processing of residual waste materials to recover energy.
- Waste treatment, reduce potential environmental, health and safety risks.
- Waste disposal, in a manner that causes the least harm to the natural environment.

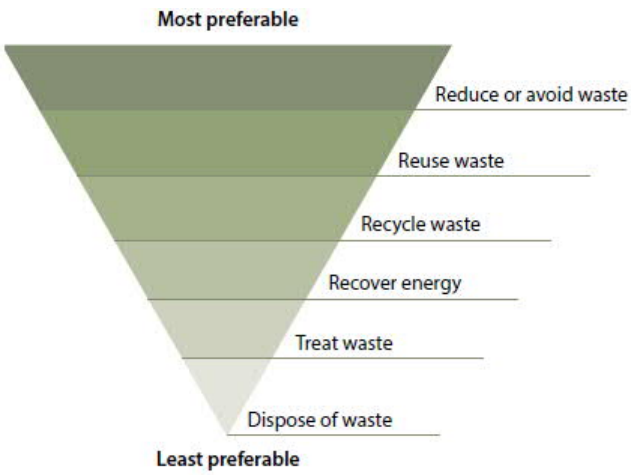


Image from NSW EPA (2014) NSW Waste Avoidance and Resource Recovery Strategy 2014-21.

Figure 3 Waste management hierarchy

3.2 Benefits of adopting better practice

Adopting better practice principles in waste minimisation offers significant benefits for organisations, stakeholders, and the wider community. Benefits from better practice waste minimisation include:

- Improved reputation of an organisation due to social and environmental responsibility.
- Lowered consumption of non-renewable resources.

- Reduced environmental impact, for example, pollution, from materials manufacturing and waste treatment.
- Reduced expenses from lower waste disposal.
- Providing opportunities for additional revenue streams through beneficial reuse.

4 Waste legislation and guidance

The legislation and guidance outlined in Table 3 below should be referred to during the site preparation, construction, and operational phases of the Development.

Table 3 Legislation and guidance

Legislation and Guidance	Objectives
Council legislation and guidelines	
City of Ryde Local Environmental Plan (LEP) 2014[2]	The Ryde LEP came into force for the entire Ryde local government area on 12 September 2014 and provides the legal framework of the Ryde Development Control Plan, including land use and development permitted in a set zone. The LEP also contains provisions to conserve local heritage and protect sensitive land.
City of Ryde Development Control Plan (DCP) 2014[3]	The City of Ryde DCP came into effect on 12 September 2014 and supports provisions of the LEP planning controls by providing detailed waste and design guidelines under Part 7.2 – Waste Minimisation and Management. Part 7.2 has been prepared to meet the objectives of the Environment Planning and Assessment Act 1979, the Waste Avoidance and Resource Recovery Act 2001, and the Protection of the Environment Operations Act 1997. The overall aim of the DCP in relation to waste is for developers to consider how they may minimise, recover, and manage waste in accordance with regulatory requirements.
Waste Management Strategy 2014 City of Ryde	Council's waste strategy focuses on the steps the city is taking to better manage waste streams, focussing on the key areas of waste avoidance, resource recovery and Advanced Waste Treatment methods. The Strategy includes measures to implement a Waste Minimisation plan, as well as actions to engage, inform and educate the public and industry of the benefits of clever waste management and recycling to meet the City's current and future needs.
State and National legislation and guidelines	
Building Code of Australia (BCA) and relevant Australian Standards	The BCA has the aim of achieving nationally consistent, minimum necessary standards of relevant health and safety, amenity, and sustainability objectives efficiently.
Council of Australian Governments National Construction Code 2019	The National Construction Code 2019 sets the minimum requirements for the design, construction, and performance of buildings throughout Australia.
NSW EPA's Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities 2012	These better practice guidelines present information on waste minimisation and resource recovery as well as information on commonly used waste management provisions. The guidelines also provide benchmarks for assessing waste production rates in Australia.
NSW Waste and Sustainable Materials Strategy 2041	Replacing the NSW Waste Avoidance and Resource Recovery Strategy (2014-21) (see below) identifies a focus on the transition of NSW to a circular economy. The focus of the strategy is on minimising what is thrown away, and to use and reuse resources more efficiently, making them as productive as possible. The strategy identifies the need to identify infrastructure needs, the mandating of separation of some organic waste streams, and incentivising biogas generation from waste materials.

[2] City of Ryde, Local Environmental Plan, 2014. (https://legislation.nsw.gov.au/maintop/view/inforce/epi+608+2014+cd+0+N)

[3] City of Ryde, Development Control Plan (https://www.ryde.nsw.gov.au/Business-and-Development/Planning-Controls/Development-Control-Plan)

Legislation and Guidance	Objectives
NSW EPA (2014) NSW Waste Avoidance and Resource Recovery Strategy 2014-21	The NSW Waste Avoidance and Resource Recovery Strategy 2014-21 is aimed at ultimately 'improving environment and community well-being by reducing the environmental impact of waste and using resources more efficiently' by presenting a framework intended to avoid and reduce waste generation, increase recycling, divert more waste from landfill, manage problem waste better, reduce litter, and reduce illegal dumping. This Strategy remains relevant as council requirements have not yet been updated.
NSW EPA Resource Recovery Orders and Resource Recovery Exemptions	The NSW EPA has issued a number of resource recovery orders and resource recovery exemptions under the POEO (Waste) Regulation 2014 for a range of waste that may be recovered for beneficial re-use. These wastes typically include those from demolition and construction works, as well as operational waste such as food waste. • Resource recovery orders present conditions which generators and processors of waste must meet to supply the waste material for beneficial re-use. • Resource recovery exemptions contain the conditions which consumers must meet to use waste for beneficial re-use.
NSW EPA's Waste Classification Guidelines 2014	The NSW EPA Waste Classification Guidelines assists waste generators to effectively manage, treat and dispose of waste to ensure the environmental and human health risks associated with waste are managed appropriately and in accordance with the POEO Act 1997 and is associated regulations.
Protection of the Environment Operations Act (POEO) 1997 and Amendment Act 2011	The POEO Act 1997 and POEO Amendment Act 2011 are administered by the NSW Environment Protection Authority (NSW EPA) to enable the NSW Government to establish instruments for setting environmental standards, goals, protocols, and guidelines. They outline the regulatory requirements for lawful disposal of waste generated during the demolition, construction, and operational phases of a development, as well as the system for licencing waste transport and disposal.
The Work Health and Safety Regulation 2017	The Work Health and Safety Regulation 2017 provide detailed actions and guidance associated with the topics discussed in The Work Health and Safety Act 2011. The primary aim of the regulation is to protect the health and safety of workers and ensure that risks are minimised in work environments. Workplaces are to ensure that they are compliant with the requirements specified in the regulations. The regulations discuss items such as actions that are prohibited or obligated in work environments, the requirements for obtaining licences and registrations, and the roles and responsibilities of staff in workplaces.
Waste Avoidance and Resource Recovery Act 2001	The Waste Avoidance and Resource Recovery Act 2001 aims to promote waste avoidance and resource recovery and repeals the Waste Minimisation and Management Act 1995. Specific objectives of the Waste Avoidance and Resource Recovery Act 2001 include: • encouraging efficient use of resources • minimising the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste • ensuring industry and the community share responsibility in reducing/dealing with waste, and • efficiently funding of waste/resource management planning, programs, and service delivery. As of 2016, the addition to the Act of Part 5 defines the legislative framework for the 'Return and Earn Container Deposit Scheme' whereby selected beverage containers can be returned to State Government authorities for a monetary refund.

5 Site preparation and construction waste and recycling management

5.1 Targets for resource recovery

Targets for new development are expected to contribute to state specific targets. The NSW Waste and Sustainable Materials Strategy 2041 (DPIE, 2021[4]) sets a target of 80% average recovery rate from all waste streams by 2030. Analysis by DPIE (2021) indicates that construction and demolition waste recovery rates in FY19 were 77%.

Council's Waste Management Strategy[5] refers to the EPA landfill diversion target for commercial and industrial waste of 76% in reference to targets for construction and demolition waste, although does not explicitly set a target. The rates reported in the Waste Management Strategy were above 80% recovery.

It is anticipated that the waste minimisation measures in the following sections will assist the Development to meet these targets. Waste reporting and audits can be used to determine the actual percentage of waste that have been recycled during the construction and site preparation stage of the Development.

5.2 Waste streams and classifications

The site preparation and construction of the Development is likely to generate the following broad waste streams:

- Site clearance waste
- Construction waste
- Plant maintenance waste
- Packaging waste, 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 Table 4.

For further information on how to classify a waste type refer to the NSW EPA (2014) Waste Classification Guidelines[6]. Further information on managing site preparation and construction waste is available from the NSW EPA website[7].

[4] NSW Government, Department of Planning, Industry and Environment (DPIE), 2021. NSW Waste and Sustainable Materials Strategy 2041. Stage 1: 2021-2027 (https://www.dpie.nsw.gov.au/__data/assets/pdf_file/0006/385683/NSW-Waste-and-Sustainable-Materials-Strategy-2041.pdf)

[5] City of Ryde, 2014. Waste Management Strategy, 2014.

[6] Available online from https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/waste-classification-guidelines

[7] http://www.epa.nsw.gov.au/your-environment/waste/industrial-waste/construction-demolition

Table 4 Potential waste types and their management methods

Waste Types	NSW EPA Waste Classification	Proposed Management Method
Site Clearance		
Green waste including timber, pine, and particle board	General solid waste (non-putrescible)	Separated, some chipped and stored on-site for landscaping, remainder to landscape supplies or off-site recycling. Stumps and large trees to landfill.
Clean fill	General solid waste (non-putrescible)	On-site re-use
Contaminated fill	To be classified subject to the results of testing	Off-site treatment or disposal to landfill
Excavated natural material (ENM) or virgin excavated natural material (VENM)	General solid waste (non-putrescible)	On-site re-use of topsoil for landscaping of the site, off-site beneficial re-use or send to landfill site.
Construction		
Sediment fencing, geotextile materials	General solid waste (non-putrescible)	Reuse at other sites where possible or disposal to landfill
Concrete	General solid waste (non-putrescible)	Off-site recycling for filling, levelling, or road base
Bricks and pavers	General solid waste (non-putrescible)	Cleaned for reuse as footings, broken bricks for internal walls, crushed for landscaping or driveway use, off-site recycling
Gyprock or plasterboard	General solid waste (non-putrescible)	Off-site recycling or returned to supplier
Sand or soil	General solid waste (non-putrescible)	Off-site recycling
Metals such as fittings, appliances, and bulk electrical cabling, including copper and aluminium	General solid waste (non-putrescible)	Off-site recycling at metal recycling compounds and remainder to landfill
Conduits and pipes	General solid waste (non-putrescible)	Off-site recycling
Timber	General solid waste (non-putrescible)	Off-site recycling, Chip for landscaping, Sell for firewood Treated: reused for formwork, bridging, blocking, propping or second-hand supplier Untreated: reused for floorboards, fencing, furniture, mulched second hand supplier Remainder to landscape supplies.
Doors, Windows, Fittings	General solid waste (non-putrescible)	Off-site recycling at second hand building supplier
Insulation material	General solid waste (non-putrescible)	Off-site disposal
Glass	General solid waste (non-putrescible)	Off-site recycling, glazing or aggregate for concrete production
Asbestos	Special waste	Off-site disposal at a licenced landfill facility.

Waste Types	NSW EPA Waste Classification	Proposed Management Method
Fluorescent light fittings and bulbs	Hazardous waste	Off-site recycling or disposal; contact FluoroCycle for more information[8]
Paint	Hazardous waste	Off-site recycling, Paintback collection[9] or disposal
Synthetic Rubber or carpet underlay	General solid waste (non-putrescible)	Off-site recycling; reprocessed and used in safety devices and speed humps
Ceramics including tiles	General solid waste (non-putrescible)	Off-site recycling at a crushing and recycling company
Carpet	General solid waste (non-putrescible)	Off-site recycling or disposal; reused for landscaping, insulation, or equestrian uses
Plant Maintenance		
Empty oil and other drums or containers, such as fuel, chemicals, paints, spill clean ups	Hazardous waste: Containers were previously used to store Dangerous Goods (Class 1, 3, 4, 5 or 8) and residues have not been removed by washing or vacuuming. General solid waste (non-putrescible): Containers have been cleaned by washing or vacuuming.	Transport to comply with the transport of Dangerous Goods Code applies in preparation for off-site recycling or disposal at licensed facility Note: Discharge to sewer subject to Trade Waste Agreement with local Council
Air filters and rags	General solid waste (non-putrescible)	Off-site disposal
Drained Oil filters	General solid waste (non-putrescible)	Off-site recycling
Commercial Lead acid or Nickel cadmium Batteries	Hazardous waste	Off-site recycling, Contact the Australian Battery Recycling Initiative[10] for more information
Packaging		
Packaging materials, including wood, plastic, including stretch wrap or LLPE, cardboard and metals	General solid waste (non-putrescible)	Off-site recycling
Wooden or plastic crates and pallets	General solid waste (non-putrescible)	Reused for similar projects, returned to suppliers, or off-site recycling. Contact Business Recycling for more information[11]
Work Compound and Associated Offices		
Food Waste	General solid (putrescible) waste	Dispose to landfill with general garbage
Recyclable beverage containers including glass and plastic bottles, aluminium cans, and steel cans	General solid waste (non-putrescible)	Co-mingled recycling at off-site licensed facility or deliver to local NSW container deposit scheme 'Return and Earn' facility[12]

[8] Available online from http://www.fluorocycle.org.au/ or http://www.environment.gov.au/settlements/waste/lamp-mercury.html
[9] Available online from https://www.paintback.com.au/
[10] http://www.batteryrecycling.org.au/home
[11] Available online from http://businessrecycling.com.au/search/
[12] Available online from http://returnandearn.org.au/

Waste Types	NSW EPA Waste Classification	Proposed Management Method
Clean paper and cardboard	General solid waste (non-putrescible)	Paper and cardboard recycling at off-site licensed facility
General domestic waste generated by workers such as soiled paper and cardboard and polystyrene	General solid waste (non-putrescible) mixed with putrescible waste	Disposal at landfill

5.3 Site preparation waste

The Development will be constructed on previously disturbed industrial land in the Macquarie Industrial Park. Site preparation activities associated with the Development are anticipated to include:

- Removal of existing internal access roads circling the site and
- 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 or demolition activities for carparks or roads. Information provided by GIDDIS Project Management indicates that the construction zone will cover 5,660 m^2. Estimates for depth of disturbance are based on SLRs experience on other projects.

Based on these assumptions, SLR estimates the quantity of waste to be generated by the removal of asphalt and road base in Table 5 below. Road base should be reused on site where possible. Asphalt should be removed from site for recycling at an appropriately licensed facility.

Table 5 Estimated quantities of site preparation waste

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

Ryde 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.

For contaminated material management, refer to Section 5.7.4 of this WMMP.

5.4 Construction Waste Types and Quantities

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 2012 for estimating the type and quantities of waste generated from construction of the Development. SLR has adopted the 'Factory' and 'Office' rates to measure waste expected from the Development. In the absence of readily available published information for 'Carpark' construction waste generation rates, SLR has developed 'Carpark' construction rates based on the 'Office' rates by:

- Removing timber, bricks and gyprock as these materials are unlikely to be present in significant quantities in a modern carpark structure, and
- Increasing the rates for concrete, sand or soil, metal and 'other', in proportion, to maintain the total assumed tonnage per 1,000 m^2 of construction.

The waste generation rates are shown in Table 6.

Table 6 Waste generation rates for the construction of the Development

Rate Type	Floor Area (m^2)	Waste types and quantities (m^3)						
		Timber	Concrete	Bricks	Gyprock	Sand or Soil	Metal	Other
Office Space (Office)	1,000	0.25	2.10	1.65	0.45	4.80	0.60	0.50
Data Centre (factory)	1,000	5.1	18.8	8.5	8.6	8.8	2.75	5
Ground floor (carpark)	1,000	--	30.6	--	--	14.3	4.5	8.1

The waste generation rates for 'Factory' are applied to calculate the waste quantities generated from the construction of each floor of the Data Centre. For the ground floor, which comprises a mix of plant and car parking, the rates for car parking have been applied.

The 'Office' waste generation rates are applied to calculate the waste quantities from all office areas. The 'Carpark' waste generation rates are applied to calculate the waste quantities from the construction of all external hard surface areas including carparks and heavy and light duty surfaces. This is taken to be the ground floor which includes car parking, access roads, plus areas for firefighting equipment and water tank storage. The areas are based on the areas provided in the site plans attached in Appendix A.

The construction waste quantities anticipated from construction are shown in Table 7.

Table 7 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	2,642	13	50	22	23	23	7	13
Data Rooms and other areas	36,513	9	77	60	16	175	22	18
Ground floor	2,700	-	83	-	-	39	12	22
Total Construction Waste	41,855	23	209	83	39	237	41	53

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.

5.5 Waste Avoidance

In accordance with Ryde DCP and better practice waste management, the Building Contractor, Building Designer and/or equivalent roles should:

- Provide space on site for the segregation and storage of waste in containers suitable for collection.
- Provide a storage area for waste that is sufficient to handle and store the waste likely to be generated during construction activities.
- Develop a purchasing policy based on the approximate quantities of materials to be used so that the correct quantities are purchased.
- Arrange for delivery of materials on an 'as needed' basis to avoid material degradation through weathering and moisture damage.
- Communicate strategies to handle and store waste to minimise environmental, health and amenity impacts.
- Select materials with a low environmental impact over the lifecycle of the building.
- Choose timber from certified plantations and avoid unsustainable timber imports including western red cedar, oregon, meranti, Luan or merbau.
- Use leased equipment rather than purchase and disposal.
- Minimise site disturbance and unnecessary excavation.
- Design the Development to require standard material sizes or make arrangements with manufacturing groups for the supply of non-standard material sizes.
- Design works for de-construction.
- Reduce packaging waste by:
  - Returning packaging to suppliers where practicable to reduce waste further along the supply chain
  - Purchasing in bulk
  - Requesting cardboard or metal drums rather than plastics
  - Requesting metal straps rather than shrink wrap, and
  - Using returnable packaging such as pallets and reels.
- Use prefabricated materials.
- Select materials for Project works with low embodied energy properties or materials that have been salvaged or recycled for the construction of the Development including concrete that utilises slag and fly ash content, structural and reinforced steel that uses recycled steel content or bulk insulation products that contain recycled content, such as recycled glass in glass-wool.
- Preferentially use paints, floor coverings and adhesives with low VOC (volatile organic compound) content.
- Reduce the use of polyvinyl chloride products.
- Implement measures to prevent the occurrence of windblown litter, dust, and stormwater pollution.

- Ensure subcontractors are informed of and implement site waste minimisation and management procedures.

5.6 Reuse, Recycling and Disposal

Effective management of construction materials and construction and demolition waste, including options for reuse and recycling where applicable and practicable, will be conducted. Only waste that cannot be cost effectively reused or recycled are to be sent to landfill or appropriate disposal facilities.

Refer to Table 4 for an outline of the proposed reuse, recycling and disposal methods for potential site preparation and construction waste streams generated by the Development.

In accordance with Ryde DCP and best practice waste management, the following specific procedures should be implemented:

- Ensure the site's project management of the site includes minimising waste generation, requiring the appropriate storage and timely collection of waste materials, and maximising re-use or recycling of materials.
- Store waste on site appropriately to prevent cross-contamination and guarantee the highest possible re-use value.
- Consider the potential of any new materials to be re-used and recycled at the end of the Development's life.
- Determine opportunities for the use of prefabricated components and recycled materials.
- Strip topsoil from areas designated for excavation and store it on site for reuse.
- Reuse excavation material will be on-site where possible.
- Re-use formwork where appropriate.
- Retain roofing material cut-offs for re-use or recycling.
- Retain used crates for storage purposes unless damaged.
- Recycle cardboard, glass and metal waste.
- Recycle or dispose of solid waste timber, brick, concrete, asphalt, and rock, where such waste cannot be re-used on site, to an appropriately licenced construction and demolition waste recycling facility or an appropriately licenced landfill.
- Dispose of all asbestos and/or hazardous waste in accordance with SafeWork NSW and NSW EPA requirements.
- Deliver batteries and florescent lights to drop off-site recycling facility.
- Return excess materials and packaging to the supplier or manufacturer.

5.7 Waste Storage and Servicing

5.7.1 Waste Segregation and Storage

As outlined in Ryde DCP, waste materials produced from site preparation and construction activities are to be separated at the source and stored separately on-site. It is anticipated that the Development will provide enough space on-site for separate storage, for example, separate skip bins or appropriately managed stockpiles, of the following waste types:

- Bricks, concrete, and scrap metal
- Metal and steel, in a condition suitable for recycling at metal recycling facilities
- Timber
- Glass
- Hardstand rubble
- Uncontaminated excavation spoil if present
- Contaminated excavation spoil if present
- Hazardous waste if present
- Paper and cardboard
- General co-mingled recycling waste, and
- Non-recyclable general waste.

If there is insufficient space on-site for full segregation of waste types, the Site Manager, or equivalent role, should consult with the waste and recycling collection contractor to confirm which waste types may be co-mingled prior to removal from the site.

5.7.2 Waste Storage Areas

Under the Ryde DCP, waste storage areas will be accessible and allow enough space for storage and servicing requirements. The storage areas will also be flexible in order to cater for change of use throughout the Development. Where space is restricted, dedicated stockpile areas are to be delineated on the site, with regular transfers to dedicated skip bins for sorting.

All waste placed in skips or bins for disposal or recycling will be adequately contained to ensure that the waste does not fall, blow, wash or otherwise escape from the site. Waste containers and storage areas are to be kept clean and in a good state of repair.

As described in Ryde DCP, areas designated for waste storage should:

- Allow unimpeded access by site personnel and waste disposal contractors
- Consider environmental factors which could potentially cause an impact to the waste storage, such as slope, drainage and the location of watercourses and native vegetation
- Allow enough space for the storage of garden waste and other waste materials on-site

- Employ adequate environmental management controls to prevent off-site migration of waste materials and contamination from the waste. For example, consideration of slope, drainage, proximity relative to waterways, stormwater outlets and vegetation
- Consider visual amenity, safety, accessibility, and convenience in their selection, and
- Not present hazards to human health or the environment.

5.7.3 Waste Servicing and Record Keeping

The Site Manager or equivalent role is to:

- 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:
- Descriptions and estimated amounts of all waste materials removed from site
- Details of the waste and recycling collection contractors and facilities receiving the waste and recyclables
- Records of waste and recycling collection vehicle movements, for example, date and time of loads removed, licence plate of collection vehicles, tip dockets from receiving facility, and
- 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.

If skips and bins are reaching capacity, removal and replacement should be organised as soon as possible. All site generated building waste collected in the skips and bins will leave the site and be deposited in the approved site lawfully able to accept them.

5.7.4 Contaminated or Hazardous Waste Management

During the site preparation and construction phases, SLR recommends that a qualified and certified contractor is engaged to remove any contaminated or hazardous materials encountered or produced, for example, asbestos, and dispose of all contaminated or hazardous waste at an appropriately licenced facility.

All asbestos and other hazardous waste must be handled according to appropriate legislation and regulation including the Work Health and Safety Regulation 2017.

In accordance with Ryde DCP, hazardous waste management at the site may require a licence from the EPA and approval from Council. If hazardous waste is identified for removal, Council and NSW EPA are to be consulted prior to undertaking any hazardous waste removal.

5.8 Site Inductions

All staff, including sub-contractors and labourers, employed during the site preparation and construction phases of the Development must undergo induction training regarding waste management for the Site.

Induction training is to cover, as a minimum, an outline of the WMMP including:

- 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 waste
- Waste related signage
- The implications of poor waste management practices, and
- Responsibilities and reporting, including identification of personnel responsible for waste management and individual responsibilities.

It is the responsibility of the Site Manager or Building Contractor to notify Council of the appointment of waste removal, transport, or disposal contractors.

5.9 Signage

Standard signage is to be posted in all waste storage and collection areas. All waste containers should be labelled correctly and clearly to identify stored materials.

Signs approved by the NSW EPA for labelling of waste materials are available online[13] and should be used where applicable. A selection of signs prepared by NSW EPA is provided in Figure 4.

Figure 4 Examples of NSW EPA labels for waste skips and bins

5.10 Monitoring and Reporting

The following monitoring practices are to 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.

[13] NSW EPA approved waste materials signage https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/business-government-recycling/standard-recycling-signs

- Record this information to track waste avoidance, reuse, and recycling performance and to help in waste estimations for future waste management plans.

As described in Ryde DCP, records of waste quantities recycled, reused or contractor removed are to be maintained. This can include dockets or receipts verifying recycling and disposal in accordance with this WMMP. This evidence should also be presented to regulatory bodies when required.

Daily visual inspections of waste storage areas will be undertaken by site personnel and inspection checklists and logs recorded for reporting to the Site Manager on a weekly basis or as required. These inspections will be used to identify and rectify any resource and waste management issues.

Waste audits are to be carried out by the Building Contractor to gauge the effectiveness and efficiency of waste segregation procedures and recycling and reuse initiatives. Where audits show that the above procedures are not carried out effectively, additional staff training will be undertaken and signage re-examined.

5.11 Roles and Responsibilities

All personnel have a responsibility for their own environmental performance and compliance with all legislation. It will be the responsibility of the Building Contractor to implement the WMMP, and an employee and subcontractor responsibility to ensure that they always comply with the WMMP.

Where possible, an environmental management representative should be appointed for the Development. Suggested roles and responsibilities are provided in Table 8.

Table 8 Suggested roles and responsibilities for site preparation and construction waste management

Responsible Person	General Tasks
Construction Site Manager	Ensuring plant and equipment are well maintained.
	Ordering only the required number of materials.
	Keeping materials segregated to maximise reuse and recycling.
	Ultimately responsible for routinely checking waste sorting and storage areas for cleanliness, hygiene and safety issues, contaminated waste materials, and also ensuring that all monitoring and audit results are well documented and carried out as specified in the WMMP.
Construction Environmental Manager or equivalent	Approaching and establishing the local commercial reuse of materials where reuse on-site is not practical.
	Establishing separate skips and recycling bins for effective waste segregation and recycling purposes.
	Ensuring staff and contractors are aware of site requirements.
	Provision of training of the requirements of the WMMP and specific waste management strategies adopted for the Development.
	Contaminated waste management and approval of off-site waste transport, disposal locations and checking licensing requirements.
	Approval of off-site waste disposal locations and checking licensing requirements.
	Assessment of suspicious potentially contaminated materials, hazardous materials, and liquid waste.
	Monitoring, inspection, and reporting requirements.

Daily visual inspections of waste storage areas may be delegated to other on-site staff. All subcontractors will be responsible for ensuring that their work complies with the WMMP through the project induction and contract engagement process.

6 Operational waste management

6.1 Targets for resource recovery

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 C&I waste, other than aligning with the State targets.

It is anticipated that the waste minimisation measures in the following sections will assist the Development 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.

6.2 Waste streams and classifications

The operation of the Development is anticipated to generate the following broad waste streams:

- Domestic waste generated by employees, including food waste
- Bulk packaging waste, including polystyrene, plastic wrapping, and cardboard boxes
- General office waste
- Electronic waste
- Garden organic waste from landscaped areas
- Bulky waste items such as furniture
- Stores, plant, and general maintenance waste, and

Potential ongoing waste types, their associated waste classifications, and management methods are provided in Table 9. For further information on how to determine a waste's classification, refer to the NSW EPA (2014) Waste Classification Guidelines. Suggestions for recycling drop off locations and contacts can be found on https://businessrecycling.com.au/ for each waste type.

Table 9 Potential waste types, classifications, and management methods for operational waste

Waste Types	NSW EPA Classification	Proposed Management Method
General Operations		
Clean office paper	General solid (non-putrescible) waste	Paper recycling at off-site licensed facility
Cardboard including bulky cardboard boxes	General solid (non-putrescible) waste	Cardboard recycling at off-site licensed facility
Recyclable beverage containers, glass and plastic bottles, aluminium cans, steel cans	General solid (non-putrescible) waste	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

Waste Types	NSW EPA Classification	Proposed Management Method
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 (non-putrescible) waste	Off-site recycling or disposal at landfill
Furniture	General solid (non-putrescible) waste	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
General garbage, including non-recyclable plastics	General solid (putrescible and non-putrescible) waste	Disposal at landfill
Maintenance		
Spent smoke detectors[14]	General solid (non-putrescible) waste, or Hazardous waste (some commercial varieties)	Disposal to landfill, or off-site disposal at licensed facility
Glass, other than containers	General solid (non-putrescible) waste	Off-site recycling
Light bulbs and fluorescent tubes	Hazardous waste	Off-site recycling or disposal, contact FluoroCycle[15] or Lamp Recyclers[16] for more information
Cleaning chemicals, solvents, area wash downs, empty oil or paint drums, chemical containers	Hazardous waste if containers used to store Dangerous Goods (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 Dangerous Goods Code applies in preparation for off-site recycling or disposal at licensed facility.
Garden organics - lawn mowing, tree branches, hedge cuttings, leaves	General solid (non-putrescible) waste	Reuse on-site or contractor removal for recycling at licenced facility
Hazardous		
E-Waste	Hazardous Waste	Off-site recycling at a licenced facility.

14 The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) require that when more than 10 smoke alarms (particularly americium-241 sources) are collected for bulk disposal they must be treated as radioactive waste and the requirements of the National Health and Medical Research Council's Code of practice for the near-surface disposal of radioactive waste in Australia (1992) must be met.

15 https://www.fluorocycle.org.au/

16 https://www.lamprecyclers.com.au/

6.3 Estimated quantities of operational waste

6.3.1 General operational waste

Schedule C of Section 7.2 Waste Minimisation and Management of Ryde DCP provides commercial waste and recycling generation rates. These do not specifically apply to data centre operation. Macquarie Data Centres has provided waste generation for the existing IC2 Data Centre. 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 three data centres to allow the development of a waste storage area that allows for waste management of entire campus waste.

Existing waste collections are:

- General waste: 1 x 4.5 m^3 bin collected weekly, about 75% full on collection
- Cardboard: 2 x 660 L bins collected weekly, about 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 IC2 waste generation rate by GFA for IC3e and IC3w. This is shown in Table 10 below.

Table 10 Estimated operational waste

	IC2	IC3e	IC3w	Total
GFA Office Space	324	169	1,361	1,854
GFA Data Hall	4,454	6,562	9,377	20,393
Totals	4,778	6,731	10,738	22,247
Estimated waste generation				
General Waste (L per week)	3,375	4,842	7,624	15,841
Cardboard (L per week)	1,650	2,367	3,758	7,775

At present separation of other recyclables is not undertaken. SLR recommends that recyclable waste generated in the office space within each IC be separated.

Using the waste generation rates in Table 10 above, the approximate weekly waste quantities for the Development have been calculated.

Table 11 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)
Waste data centre campus (total)	15,841	5,184	7,775
IC3w (this proposal)	7,624	2,506	3,758

6.3.2 Additional operational waste

In addition to the estimated quantities of waste and recycling listed in Table 11, the Development is anticipated to produce:

- E-waste, generated from fit out and decommissioning of individual data centres and associated infrastructure
- Minimal quantities of green landscaping waste
- Other waste 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 data centre 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, packing waste should be returned to suppliers where possible. As larger quantities of packaging waste may be campaign sourced, that is, from new fit outs, 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 Development is anticipated to produce minimal quantities of garden organics. This waste will be taken by a landscaping contractor who will dispose of it at an off-site licenced facility.

6.4 Waste Storage Area Size

6.4.1 Ryde Council Requirements

Ryde DCP requires all commercial premises to:

- Have a dedicated waste and recycling storage room or area which has adequate storage space to meet the needs of the land use activity.
- All waste and recycling storage rooms and areas must be designed and constructed in accordance with the requirements of Schedule 4 (refer to S4.2 Waste and Recycling Storage Rooms and S4.5 External Waste and Recycling Storage Areas (see Section 6.6).
- The waste and recycling storage room or area must provide separate containers for the separation of recyclable materials from general waste. Standard and consistent signage on how to use the waste management facilities should be clearly displayed.
- Space must be provided in each occupancy for the temporary storage of garbage and recyclables generated in that area.
- Hazardous and special waste is to be stored in accordance with relevant occupational, health and safety and environmental protection legislation.
- Sufficient space in the development must be allocated to store bulky items such as used pallets and crates to prevent illegal dumping in the public domain.

For the IC3w 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 waste generated from the entire campus.

All waste storage room calculations have considered the bin dimensions listed in the Ryde DCP, as shown in Table 12.

Table 12 Dimensions and approximate footprint of bins

Dimension	Height (mm)	Depth (mm)	Width (mm)	Footprint (m²)
660 L rear lift other recycling	1,080	770	1,360	1.05
1100 L 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 footprint. This can also act as a contingency in the event of spikes in waste generation.

The recommended storage areas do not include consideration for the storage of bulky and hazardous waste. For the additional storage space for bulky waste, refer to Section 6.4.2.

6.4.2 Bulky waste

As outlined in the Ryde DCP, 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 1100-litre bin to be stored in 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 recommends 8 m² be allocated for bulky waste storage.

6.4.3 Total waste storage

The estimated number of bins required for weekly storage of operational waste and recycling generated by the Development is shown in Table 13 and based on:

- The estimated quantities of operational waste and recycling as shown in Table 11
- Bin dimensions shown in Table 12.

The estimated number of bins required for weekly storage of operational waste and recycling generated by the Development is shown in Table 13.

Table 13 Minimum number of bins and waste storage area for operational waste of the Development

Waste type	Capacity	Number	Collection frequency per week	Storage area required (m²)
General waste	1100 L	2	4	7.6
Cardboard	1100 L	1	4	3.8
Other recyclables	1100 L	1	3	3.8
Electronic Waste	1100 L	1	As required	1.7
Bins space including manoeuvring				27.0
Bulky Waste		-	As required	8
TOTAL				35.0

The waste storage area for the Development is shown in the drawing attached in Appendix A. The proposed waste storage area is show on Figure 6 adjacent to the loading dock. This area has a total of 35 m^2 which is adequate for the proposed storage requirements.

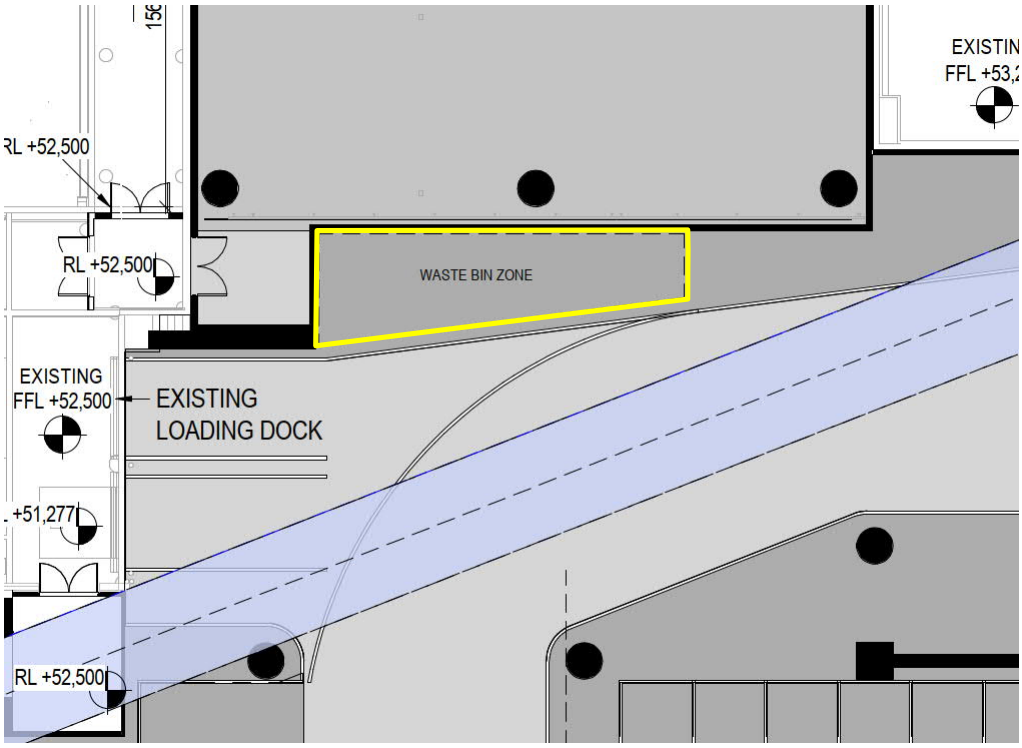


Figure 5 Indicative waste storage room layout

SLR recommends that waste audits be undertaken approximately one month into the operational phase of the Development 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.

6.5 Waste Storage Room Location

In accordance with Ryde DCP, the design for the waste storage areas of the Development takes into consideration better practice waste management and recommendations from the Ryde DCP. The proposed waste storage area services waste needs from the IC2, IC3e and the proposed IC3w. The waste storage area will be located within the IC3w Data Centre and servicing the entire campus.

In accordance with better practice waste management and Ryde DCP, the waste storage area is be located so that it:

- Provides easy, direct, and convenient access for users
- Permits easy transfer of bins to the collection point in the loading dock
- Permits easy, direct, and convenient access for collection service providers
- Does not intrude on car parking, landscaping, access and turning areas required for the type and scale of the development

- Does not reduce amenity and minimises the potential for noise, odour and other amenity and environmental impacts on residents or other occupants
- Maximises protection of trees and significant vegetation.

As described in Ryde DCP, the collection areas for the data centre are to be clearly nominated on site plans accompanying development applications. The waste storage areas are shown on the site plan as presented in Appendix A, and as shown on Figure 5, in accordance with Council requirements.

6.6 Waste Storage Area Features

In accordance with better practice waste management and Ryde DCP, the waste storage area should incorporate the following features.

Access driveways and service areas for waste collection vehicles must be designed in accordance with Australian Standard AS 2890.2-2002 Parking Facilities – Part 2: Off-street commercial vehicle facilities.

External waste and recycling storage areas must be designed and constructed in accordance with Schedule 4: S4.5. External Waste and Recycling Storage Areas.

The relevant parts of Schedule 4 S4.5 are:

- The waste and recycling storage area must be roofed to prevent the entry of rainwater. The ceiling must be of a minimum height to enable access for cleaning and the lids of bins to be fully opened.
- The floor of the waste and recycling storage area must be constructed of concrete finished to a smooth even surface.
- All uncontaminated stormwater from the roof and uncovered paved areas of the site must be directed away from the waste and recycling storage area and be drained to Council's stormwater drainage system.
- Where garbage or putrescible waste is to be stored, the floor must be graded to a floor waste connected to the sewerage system. The floor waste must be fitted with an in-floor dry basket arrestor approved by Sydney Water.
- Where garbage or putrescible waste is to be stored, a tap with a hose connection must be provided in or adjacent to the waste and recycling storage area to facilitate cleaning.
- The waste and recycling storage area must be adequately screened from the street to prevent the creation of unsightly conditions

6.7 Waste Servicing

Based on communication with the Client, SLR understands that waste collections will be undertaken through a private contractor. The following general waste servicing access requirements should be implemented:

- Waste will be removed regularly.
- Arrangements should be in place so that the waste and recycling storage rooms are not accessible to the general public.

Where possible, access must be provided for waste collection vehicles to stand on the premises when collecting waste and leave the site in a forward direction.

According to Ryde DCP, the following is required for the access provisions for of waste collection vehicles:

- Drawings must show the site's entry point, vehicle's route of travel and manoeuvring
- The site must be designed to allow collection vehicles to enter and exit the property in a forward direction with minimal need of reversing and to be operated with adequate clearances; and
- The driveway and any basement space needed are to be suitable for collection vehicles in terms of pavement strength, spatial design, access width, and height clearances. The DCP recommends using Appendix C Collection Vehicles and Appendix D Vehicle access/Turning Circles under the Better Practice Guide for Waste Management in Multi-Unit Dwellings (DECC 2008) to be used as a guide.
- Swept path models must illustrate how a standard waste collection vehicle will enter, service and exit the site
- A 0.5 m unobstructed clearance is required from all obstructions for the vehicle's ingress and egress manoeuvres
- For rear loaded vehicles, an additional 2 m unobstructed loading zone is required behind the vehicle for the loading of 1,100 L bins. Additionally, a 0.5 m side clearance is required on either side of the vehicle for driver movements and accessibility
- Unobstructed access, adequate driveways, and ramps of sufficient strength to support waste collection
- A structural engineer's report is to accompany the DA and confirm that all infrastructure used for vehicle ingress and egress movements can support the waste collection vehicle's weight. Ryde DCP consists of dimensions for waste collection vehicles.

Once a private waste contractor is engaged, a valid waste and recycling collection contract is recommended to demonstrate disposal at a waste facility lawfully able to accept it. Written evidence of the valid contract should be kept on-site.

6.8 Waste Avoidance, Reuse and Recycling Measures

6.8.1 Waste Avoidance

Waste avoidance measures include:

- Participating in take-back services to suppliers to reduce waste further along the supply chain
- Avoiding printing where possible
- Review of packaging design to reduce waste but maintain 'fit for purpose'
- Providing ceramic cups, mugs, crockery, and cutlery rather than disposable items
- Purchasing consumables in bulk to avoid unnecessary packaging
- Presenting all waste reduction initiatives to staff as part of their induction program, and
- Investigating leased office equipment and machinery rather than purchase and disposal.

6.8.2 Re-use

Possible re-use opportunities include establishing systems with in-house and supply chain stakeholders to transport products in re-useable packaging where possible.

6.8.3 Recycling

Recycling opportunities include:

- Collecting and recycling e-waste
- Flatten or bale cardboard to reduce number of bins required
- Paper recycling trays provided in office areas for scrap paper collection and recycling
- Collecting printer toners and ink cartridges in allocated bins for appropriate contractor recycling, and
- Development of 'buy recycled' purchasing policy.

6.9 Communication Strategies

Waste management initiatives and management measures should be clearly communicated to building managers, owners, employees, customers, and cleaners. Benefits of providing this communication include:

- improved satisfaction with services
- increased ability and willingness to participate in recycling
- improved amenity and safety
- improved knowledge and awareness through standardisation of services
- increased awareness or achievement of environmental goals and targets
- reduced contamination of recyclables stream
- increased recovery of recyclables and organics material, if implemented, and
- greater contribution to targets for waste reduction and resource recovery, the environment and heritage conservation.

To realise the above benefits, the following communication strategies should be considered:

- Use consistent signage and colour coding throughout the Development
- Ensure all staff are trained in correct waste separation and management procedures
- Provide directional signage to show location of and routes to waste storage area
- General waste and co-mingled recycling bins should be clearly labelled and colour-coded to ensure no cross contamination, where applicable
- Employees and cleaners should adhere to the WMMP for compliance, in consultation with management, and
- Repair signs and labels promptly to avoid breakdown of communications.

6.10 Signage

The waste storage and collection areas should be provided with appropriate signage. These signs should clearly identify waste management procedures and provisions to contractors, tenants and visitors should be distributed around the Development.

Signs which clearly identify waste management procedures and provisions to staff and visitors should be distributed around the Development. Key signage considerations are:

- Clear and correct labelling on all waste and recycling bins, indicating the correct type or types of waste that can be placed into a given bin, as shown in Figure 6
- Signposts and directions to location of waste storage areas
- Clear signage in all waste storage areas to instruct users how to correctly separate waste and recycling
- Maintaining a consistent style colour scheme and system for signs throughout the Development, and
- Emergency contact information for reporting issues associated with waste or recycling management.

Colour-coded and labelled bin lids are necessary for identifying bins. All signage should conform to the relevant Australian Standard and use labels approved by the NSW EPA[17]. The design and use of safety signs for waste rooms and enclosures should comply with Australian Standard AS 1319 Safety Signs for the Occupational Environment and clearly describes the types of materials designated for each bin.

Figure 6 Example of bin labels for operational waste

6.11 Monitoring and Reporting

Monitoring is recommended to ensure waste and recycling management arrangements and provisions for the Development are functional, practical and are maintained to the standard outlined in this plan, at a minimum.

Visual assessments of bins and bin storage areas should 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.

In addition, audits are to be conducted on a half-yearly basis to ensure WMMP provisions are maintained.

Quantities of waste and recycling associated with disposal of waste and recycling, including dockets, receipts and other physical records should be recorded by the Building Manager. This is to allow reviews of the waste management arrangements and provisions at the site over time. Records of waste disposal should also be available to regulatory authorities such as the NSW Environmental Protection Authority and SafeWork NSW, upon request.

[17] NSW EPA waste signage and label designs http://www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm

Any deficiencies identified in the waste management system, including, but not limited to, unexpected waste quantities, is to be rectified by the Building Manager as soon as it is practical. Where audits show that recycling is not carried out effectively, management should carry out additional staff training, signage re-examination and reviews of the waste management system where the audit or other reviewing body has deemed necessary. If this waste management plan no longer sufficiently meets the needs of the Development, review, and updates to maintain suitability must be undertaken.

6.12 Roles and Responsibilities

It is the responsibility of the Building Manager, or equivalent role, to implement this WMMP and a responsibility of all warehouse tenants and staff to follow the waste management procedures set out by the WMMP. SLR recommends that all subcontractors enlisted by the Client are to have roles and responsibilities identified and the Development's waste management system clearly explained. A summary of recommended roles and responsibilities are provided in Table 14.

Table 14 Operational waste management responsibility allocation

Responsible Person	General Tasks
Management	Ensure the WMMP is implemented throughout the life of the operation.
	Update the WMMP on a regular basis (e.g., annually) to ensure the Plan remains applicable.
	Undertake liaison and management of contracted waste collections.
	Organise internal waste audits on a regular basis.
	Manage any complaints and non-compliances reported through waste audits etc.
	Perform inspections of all waste storage areas and waste management equipment on a regular basis.
	Organise cleaning and maintenance requirements for waste management equipment.
	Monitor bins to ensure no overfilling occurs.
	Ensure effective signage, communication and education is provided to alert visitors, employees, and cleaners about the provisions of this WMMP and waste management equipment use requirements.
	Monitor and maintain signage to ensure it remains clean, clear, and applicable.
	Ensure waste and recycling storage rooms are kept tidy.
	Ensure that regular cleaning and daily transfer of bins is being undertaken by the cleaners
	Ultimately responsible for the management of all waste management equipment, cleaning requirements, waste transfer and collection arrangements.
Cleaners and Staff	Removal of general waste, recyclables, cardboard waste, and hazardous waste from floor areas for transfer to centralised waste and recycling collection rooms daily or as required.
	Cleaning of all bins and waste and recycling rooms on a weekly basis or as required.
	Compliance with the provisions of this WMMP.
Gardening Contractor, as applicable	Removal of all garden organics waste generated during gardening maintenance activities for recycling at an off-site location or reuse as organic mulch on landscaped areas.

Appendix A:

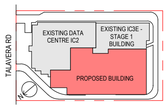
Drawings

1 mm = 0.25 m

REV	DESCRIPTION	DATE
D	REVISED SSDA ISSUE	20/10/2022
C	REVISED SSDA ISSUE	27/09/2022
B	REVISED SSDA ISSUE	16/09/22
A	REVISED SSDA ISSUE	08/08/22
8	EXISTING STORMWATER ADDED	04/07/22
7	CARPARK REVISED	28/06/22
6	EASEMENT UPDATE ISSUE	14/04/22
5	EASEMENT UPDATE ISSUE	25/02/22

NORTH POINT

KEY PLAN



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PROJECT
IC3 SUPER WEST
17-23 TALAVERA RD, MACQUARIE PARK

DRAWING TITLE
GENERAL ARRANGEMENT - GROUND LEVEL

PROJECT STATUS
WIP

PROJECT NUMBER
10301489

DRAWING NUMBER
A2101

ISSUE
D

SCALE
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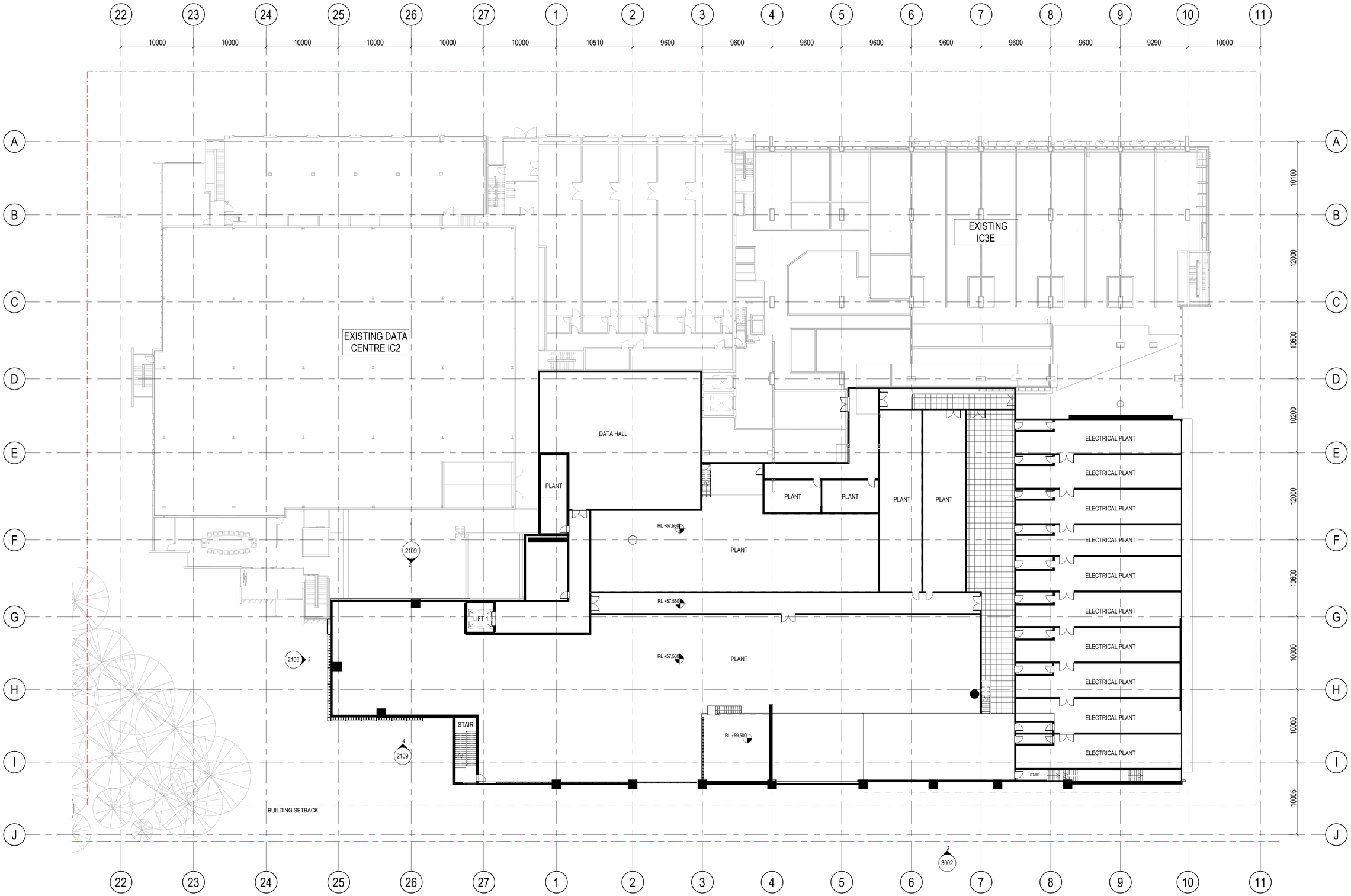

REV	DESCRIPTION	DATE
C	REVISED SSDA ISSUE	27/09/2022
B	REVISED SSDA ISSUE	16/09/22
A	REVISED SSDA ISSUE	08/08/22
3	ECI PRICING ISSUE	31/01/22
2	ISSUED FOR INFORMATION	21/01/22
1	ISSUED FOR INFORMATION	22/12/21

NORTH POINT

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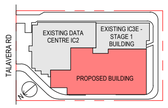

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17-23 TALAVERA RD, MACQUARIE PARK

DRAWING TITLE
GENERAL ARRANGEMENT - LEVEL 01

PROJECT STATUS
WIP

PROJECT NUMBER
10301489

DRAWING NUMBER
A2102

ISSUE
C

SCALE
1 : 250 @ A1

LEGEND:

LEVEL 1 BELOW (FULL HEIGHT SPACE)

REV	DESCRIPTION	DATE
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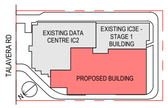
NORTH POINT

KEY PLAN



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PROJECT

IC3 SUPER WEST
17-23 TALAVERA RD, MACQUARIE PARK

DRAWING TITLE

GENERAL ARRANGEMENT - LEVEL 01B

PROJECT STATUS

WIP

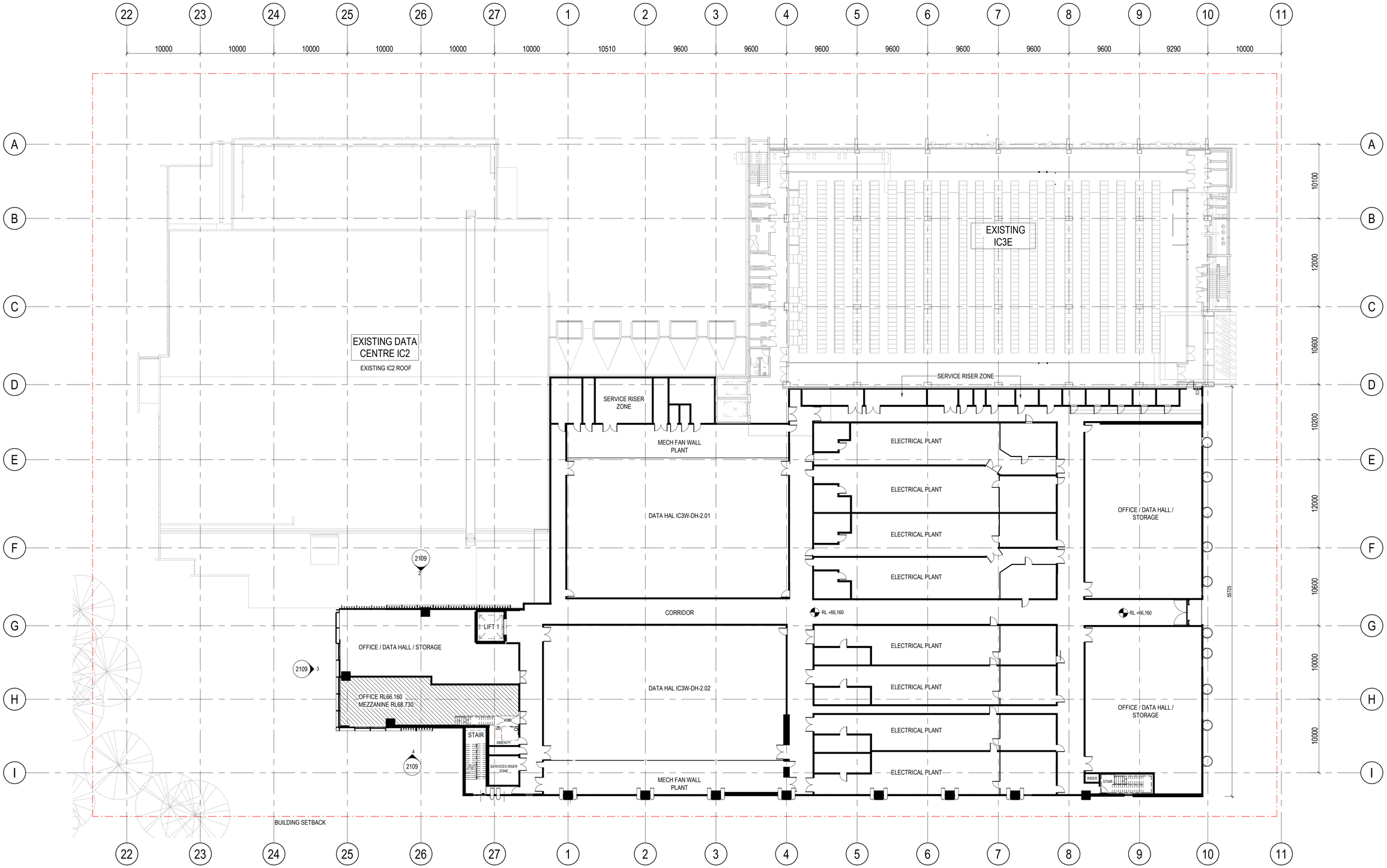
PROJECT NUMBER 10301489

DRAWING NUMBER A2102.1

ISSUE A

SCALE

As indicated @ A1



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B	REVISED SSDA ISSUE	16/09/22
A	REVISED SSDA ISSUE	08/08/22
3	ECI PRICING ISSUE	31/01/22
2	ISSUED FOR INFORMATION	21/01/22
1	ISSUED FOR INFORMATION	22/12/21

NORTH POINT

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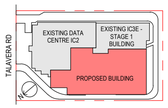

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PROJECT

IC3 SUPER WEST
17-23 TALAVERA RD, MACQUARIE PARK

DRAWING TITLE

GENERAL ARRANGEMENT - LEVEL 02

PROJECT STATUS

WIP

PROJECT NUMBER

10301489

DRAWING NUMBER

A2103

ISSUE

C

SCALE

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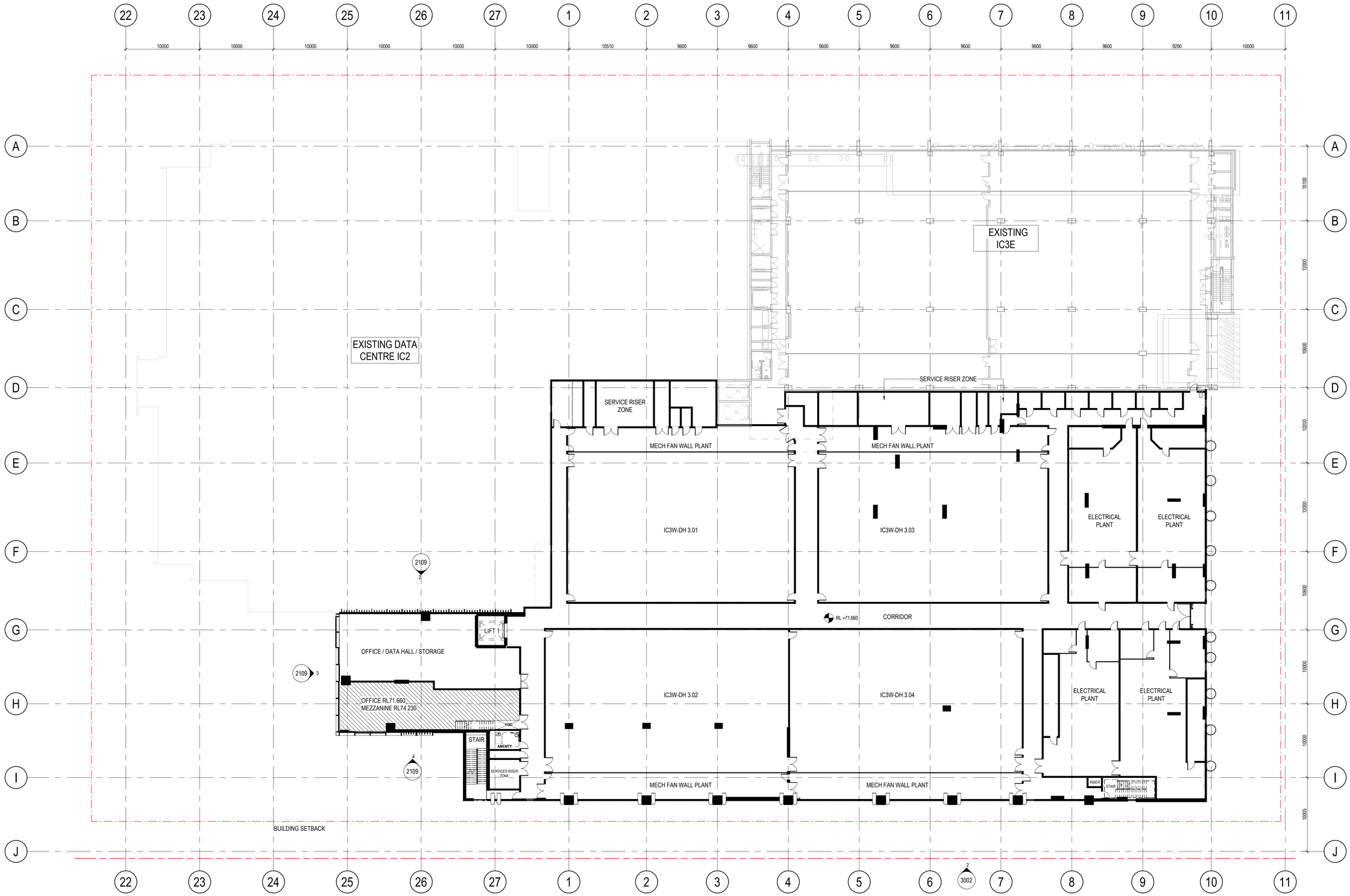

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B	REVISED SSDA ISSUE	16/09/22
A	REVISED SSDA ISSUE	08/08/22
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2	ISSUED FOR INFORMATION	21/01/22
1	ISSUED FOR INFORMATION	22/12/21

NORTH POINT

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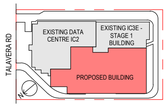

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PROJECT
IC3 SUPER WEST
17-23 TALAVERA RD, MACQUARIE PARK

DRAWING TITLE
GENERAL ARRANGEMENT - LEVEL 03

PROJECT STATUS
WIP

PROJECT NUMBER
10301489

DRAWING NUMBER
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ISSUE
C

SCALE
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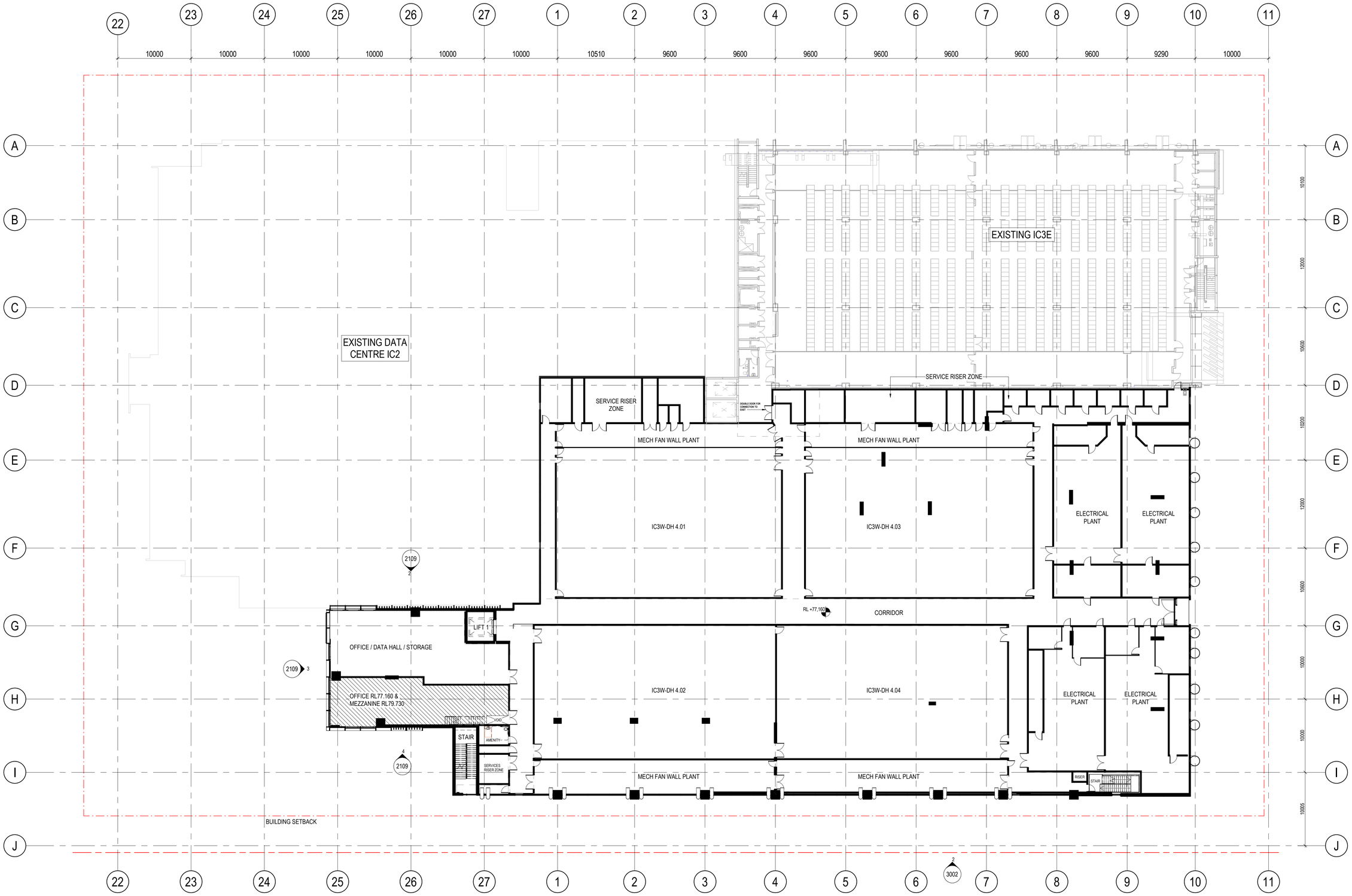

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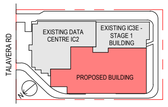

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PROJECT

IC3 SUPER WEST
17-23 TALAVERA RD, MACQUARIE PARK

DRAWING TITLE

GENERAL ARRANGEMENT - LEVEL 04

PROJECT STATUS

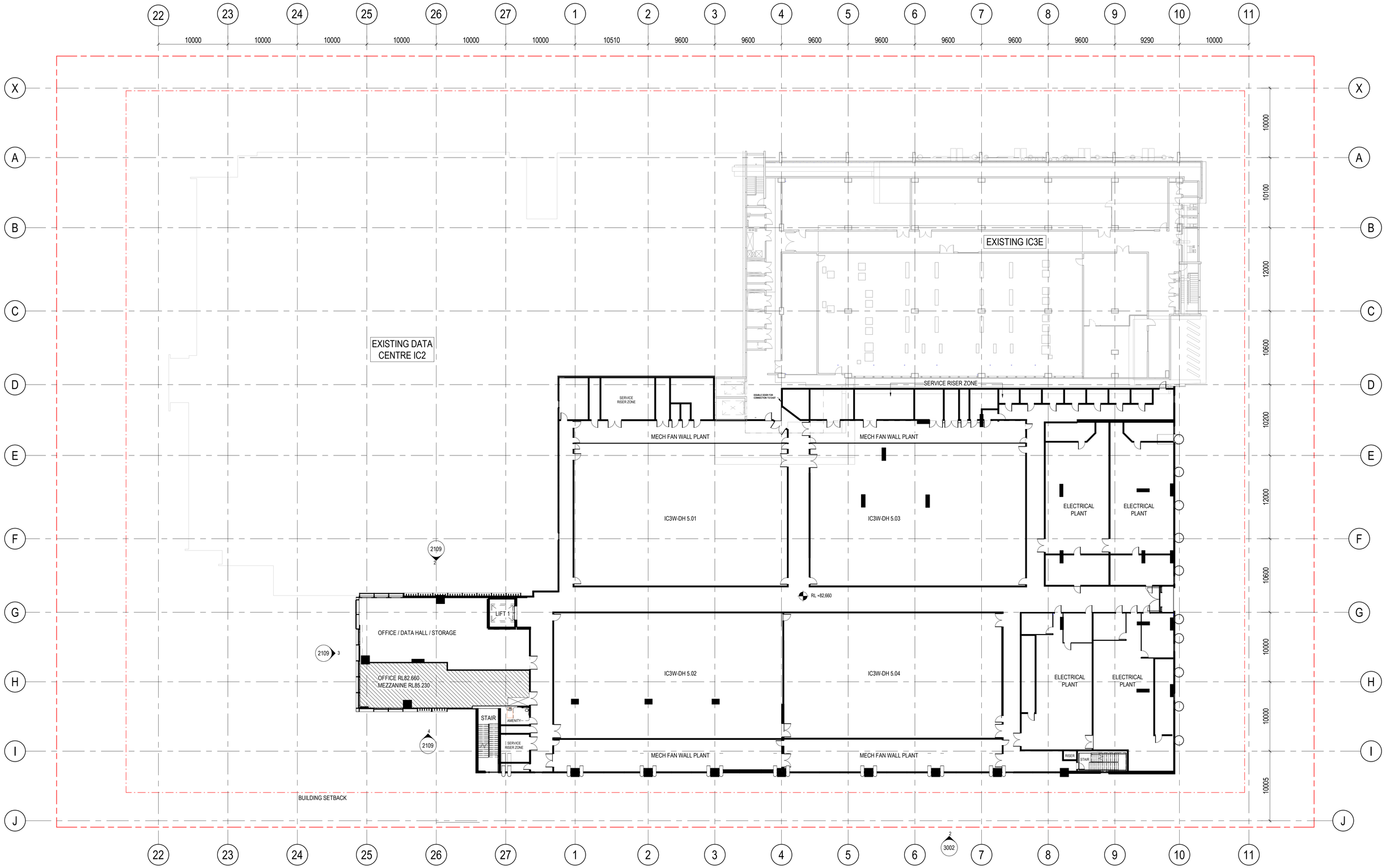
WIP

PROJECT NUMBER 10301489

DRAWING NUMBER A2105

ISSUE C

SCALE 1 : 250 @ A1



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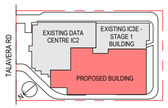

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17-23 TALAVERA RD, MACQUARIE PARK

DRAWING TITLE

GENERAL ARRANGEMENT - LEVEL 05

PROJECT STATUS

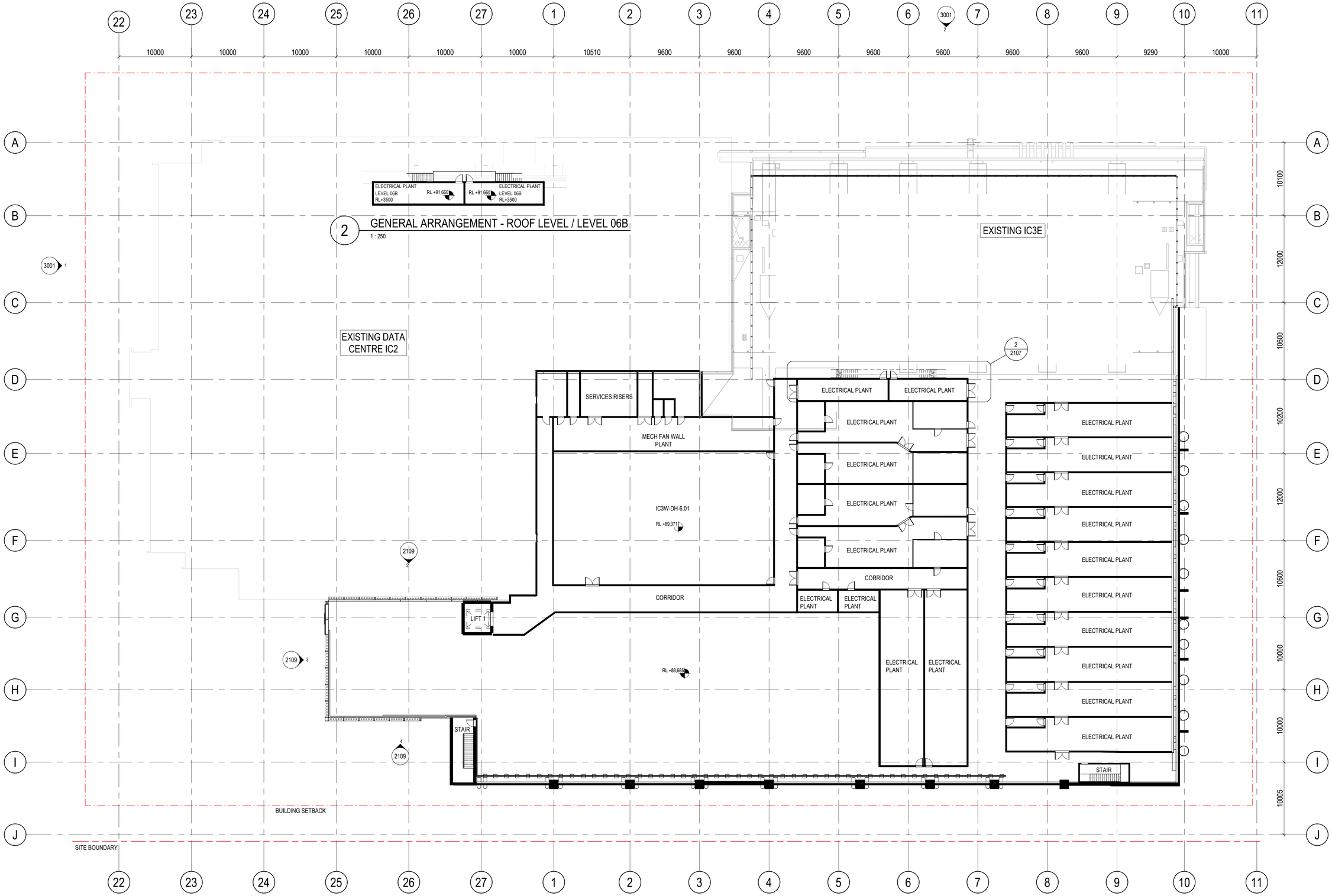
WIP

PROJECT NUMBER: 10301489

DRAWING NUMBER: A2106

ISSUE: C

SCALE: 1 : 250 @ A1



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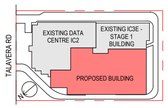

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DRAWING TITLE
GENERAL ARRANGEMENT - LEVEL 06 / ROOF LEVEL

PROJECT STATUS
WIP

PROJECT NUMBER 10301489
DRAWING NUMBER A2107
ISSUE C
SCALE 1 : 250 @ A1

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