



Infrastructure Assessment Report

IC3w Data Centre

17-23 Talavera Road, Macquarie Park, NSW 2113

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1.0 Introduction

HDR have been appointed by Macquarie Data Centres (MDC) to undertake the Infrastructure Assessment Report for the proposed development of the Macquarie Park Data Centre Campus IC3 Super West site at 17-23 Talavera Road, Macquarie Park.

This Infrastructure Assessment Report serves to support the State Significant Development Application (SSDA) relating to the proposed development. It outlines the incoming services required, with respect to capacity, availability and connections to facilitate the development.

The proposed data centre development works by Macquarie Data Centre include:

- Construction of a five (5) level building adjacent to the existing building, housing additional data halls and associated utility and private equipment.
- Amendments to car parking areas, loading docks and internal access roads.
- Reticulation of new Ausgrid HV feeders (33kV) to site.
- Extension of existing pit and pipe system to facilitate incoming communication services pathway via diverse underground route.
- Connection into existing portable water supply from Sydney Water for hydraulic and wet fire services
- Connection into existing sewerage system currently traversing through the site.
- Modifications of the site stormwater drainage network to direct stormwater runoff to existing water quality devices and on-site detention tank/s.
- The construction of an under-croft area and modifications to external areas to allow passage of overland flow through the site.

2.0 Executive Summary

This Infrastructure Assessment Report has been prepared by HDR on behalf of Macquarie Data Centres (MDC) C/- GIDDIS Project Management.

The following Infrastructure Assessment Report has been produced to support the Environmental Impact Statement (EIS) prepared by Willottree Planning PTY Ltd (Willottree Planning).

The EIS has been 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 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 involves the construction and operation of an expansion to an existing data centre located at 17-23 Talavera Road, Macquarie Park (Lot 527 in DP 752035), comprising:

- a five-storey building
- 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 Local Government Area (LGA). The proposal seeks to operate 24 hours per day, seven (7) 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 five (5) storey building extension, comprising up to:
 - 14 data halls
 - 18 back up generators
 - Fitout of the building for use as a data centre (on an as-needs basis)

3.0 Site Description

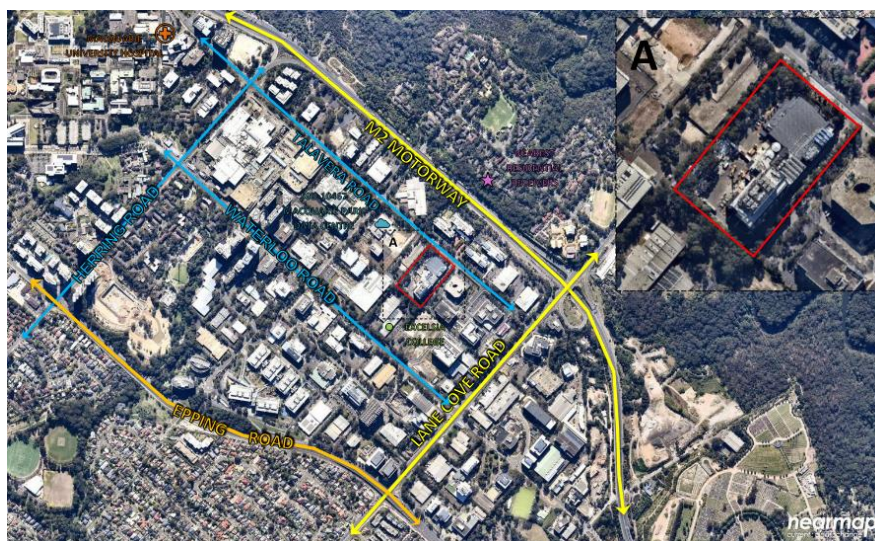
The site is described as Lot 527 DP 752035, commonly known as 17 – 23 Talavera Road, Macquarie Park. Has a total area of approximately 20,000m², with access achieved via Talavera Road.

The 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 (LDA/2018/0322), adjoining surrounding commercial premises along Talavera Road, and forming part of the wider Macquarie Park Corridor.

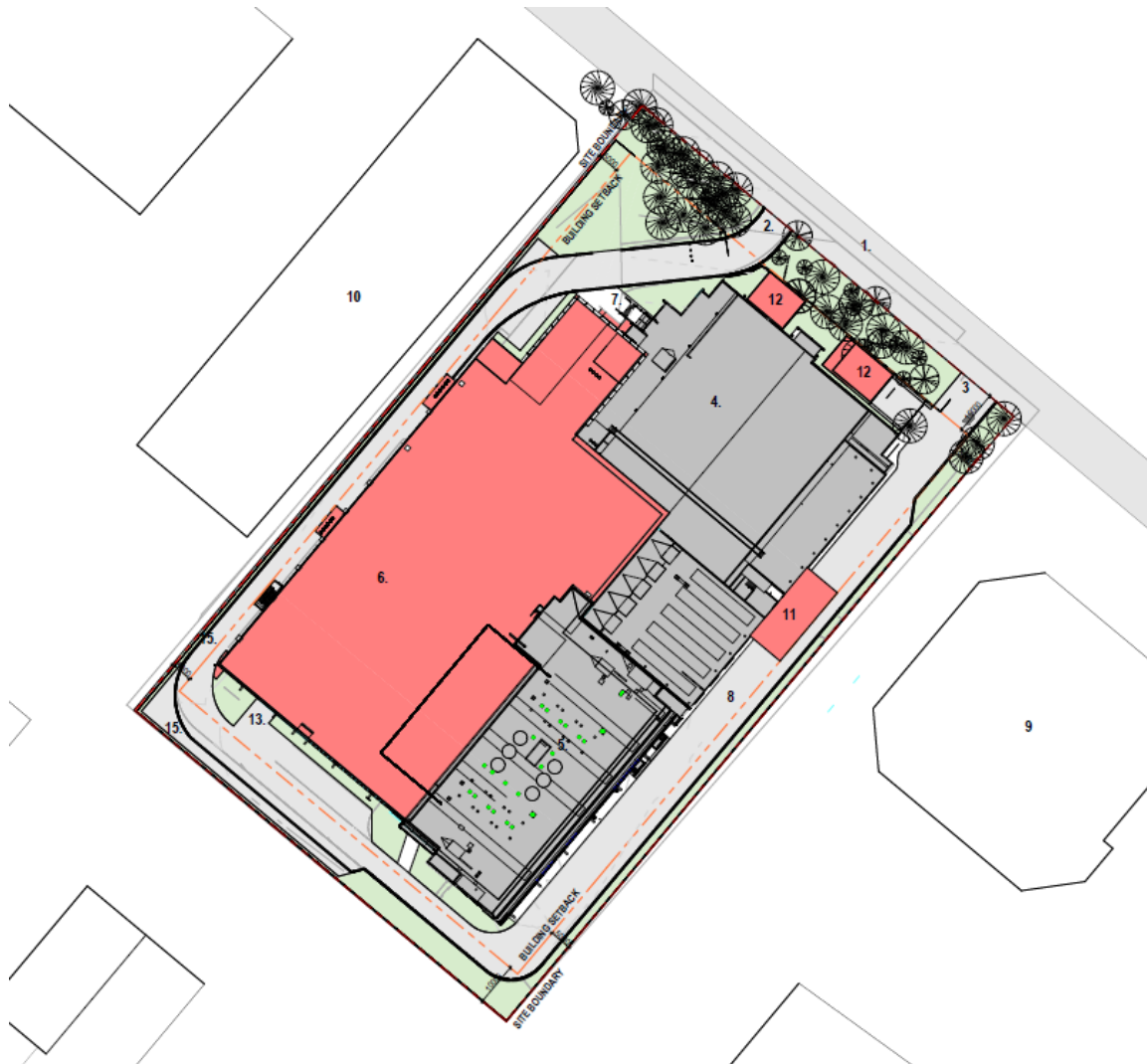
The site is situated approximately 12.5 km northwest of the Sydney CBD and 11.3 km northeast of Parramatta. It is within close proximity to transport infrastructure routes (predominantly the bus and rail networks), as well as sharing direct links with the wider regional road network, including Talavera 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



3.1 Site Location

The site 17 – 23 Talavera Road, Macquarie Park, being Lot 527 DP 752035.



4.0 Secretary's Environmental Assessment Requirements

This Infrastructure Assessment Report 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:

HDR have been appointed by Macquarie Data Centres (MDC) to undertake the Infrastructure Assessment Report for the proposed development of the Macquarie Park Data Centre Campus IC3 Super West site.

The following Secretaries Environmental Assessment Requirements (SEARS) are addressed within Table 1 of this report.

Table 1

SEARs Items	Secretary's Environmental Assessment Requirements	Response
Key Issue	<p>The following SEARS requirements are to be addressed within this document</p> <ul style="list-style-type: none"> • 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 <p>in consultation with Council:</p> <ul style="list-style-type: none"> • 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. 	<p><i>Section 5.0 Appendix A, Appendix B Appendix D Figures 3-10</i></p> <p><i>Section 5.1, 5.2 Figures 3-10</i></p> <p><i>Section 5.1 Appendix A</i></p> <p><i>Section 5.5</i></p> <p><i>Section 5.6</i></p>

5.0 Incoming Services

The incoming services outlined within this report include:

- Electricity
- Communication Services
- Portable Water
- Sewerage
- Storm Water
- Overland Flow

It is to be noted that no gas connection is proposed for the development/ site.

5.1 Electricity

The Phase 1 deployment of IC3w 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.

5.2 Communication Services

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 and IC3w Data Centres. The external pit and pipe system will be extended to serve IC3w.

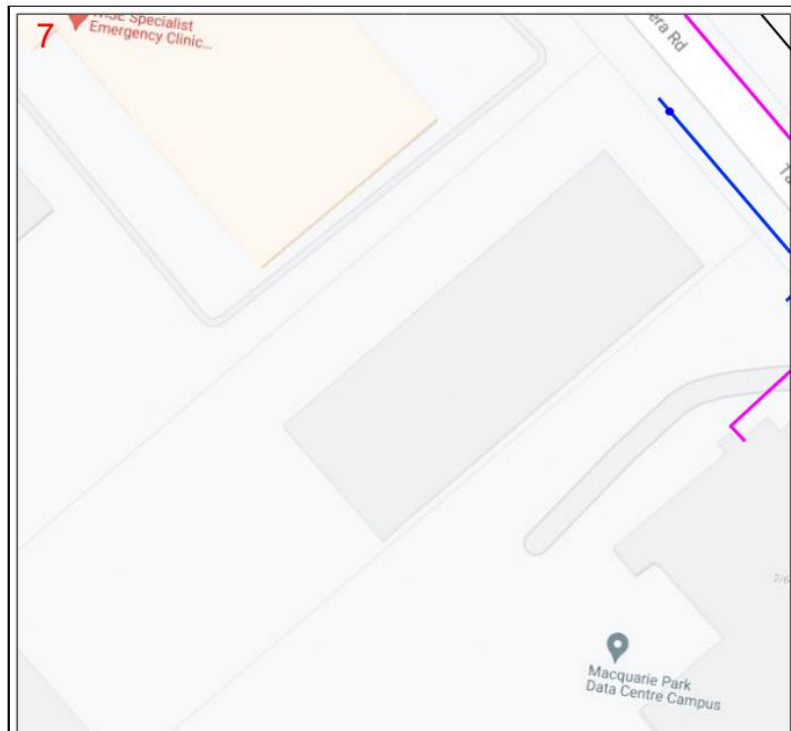
It is anticipated that carrier services will be organised directly by Macquarie Data Centre. Dial Before You Dig (DBYD) plans indicate that there are multiple telecommunication services providers in the vicinities of the site, refer to below images for details.



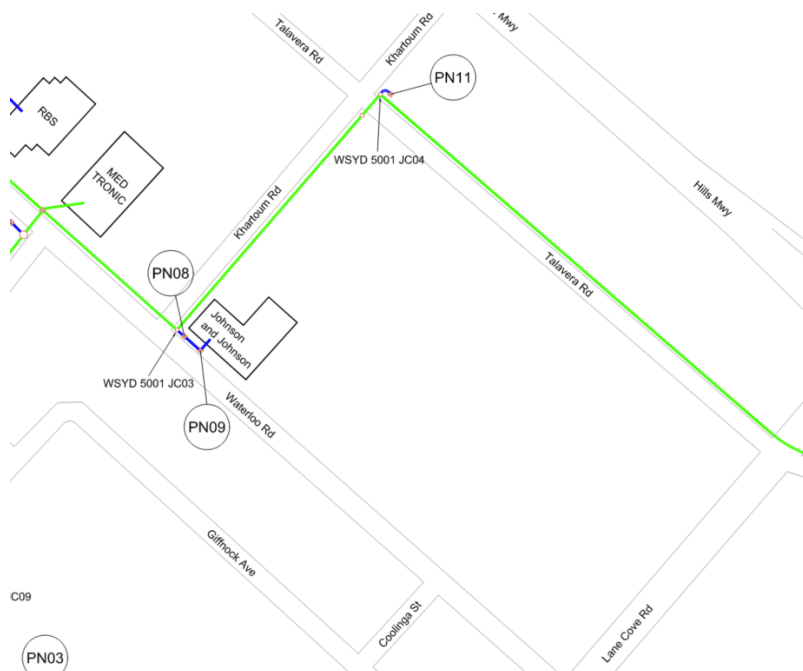
Superloop Telecommunication Assets around 17-23 Talavera Road, Macquarie Park (Source: DBYD)



TPG Telecommunication Assets around 17-23 Talavera Road, Macquarie Park (Source: DBYD)



Detail 7 of Figure 5 (Source DBYD)

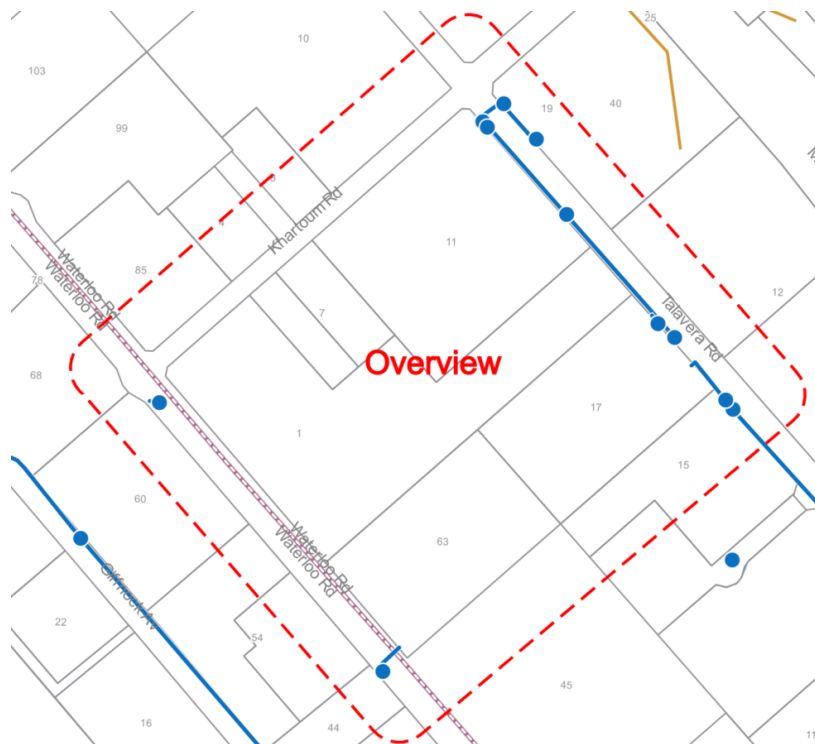


Verizon Asset around 17-23 Talavera Road, Macquarie Park (Source: DBYD)





Optus Asset around 17-23 Talavera Road, Macquarie Park (Source: DBYD)



Vocus Communications Asset around 17-23 Talavera Road, Macquarie Park

5.3 Potable Water

The existing Sydney Water portable supply is suitable to supply the combined water and wet fire services demand across the entire site (IC2, IC3e and IC3w).

The required flow rate for the site is 39L/s spread over the three (3) buildings as per below break up:

- Existing IC2 – 1 Litre/second
- Existing IC3e - 9.35 Litres/second
- New IC3w – 28.6 Litres/second
- Total Site Demand – 38.95 Litres/second

The Pressure and Flow Enquiry conducted in previous stages indicates that the street flow rate is capable of delivering 50L/s. (Refer to Appendix A for Pressure and Flow Statement received). A new Pressure and Flow Enquiry is being conducted as part of detail design with existing pressure and flow information provided as part of this report.

With the indicated flow rate of 39L/s it is anticipated that tanks and pumps will be required to meet Uptime and Tennant requirements. A Sydney Water Feasibility application has been submitted to Sydney Water on 24/09/2021 to confirm Sydney Water's Infrastructure can cater for the new proposed potable water demands (approx. 12 week process).

e-Developer

WORKFLOW TRAIL

CASE INFORMATION

Case Number

194547

Application Type

Feasibility

Development Location

17-23 TALAVERA RD, Macquarie Park

WSC Company Name

CARDNO NSW ACT PTY LTD

WORKFLOW TRAIL

TimeStamp

Workflow Step

Action

User

24/09/2021 09:54

Case Start

Start Case

agroni54

24/09/2021 09:54

Application Entry

Processed To

agroni54

24/09/2021 12:23

Application Entry

Released By

agroni54

24/09/2021 12:23

Assion Case

Processed To

TL DEFF NOR

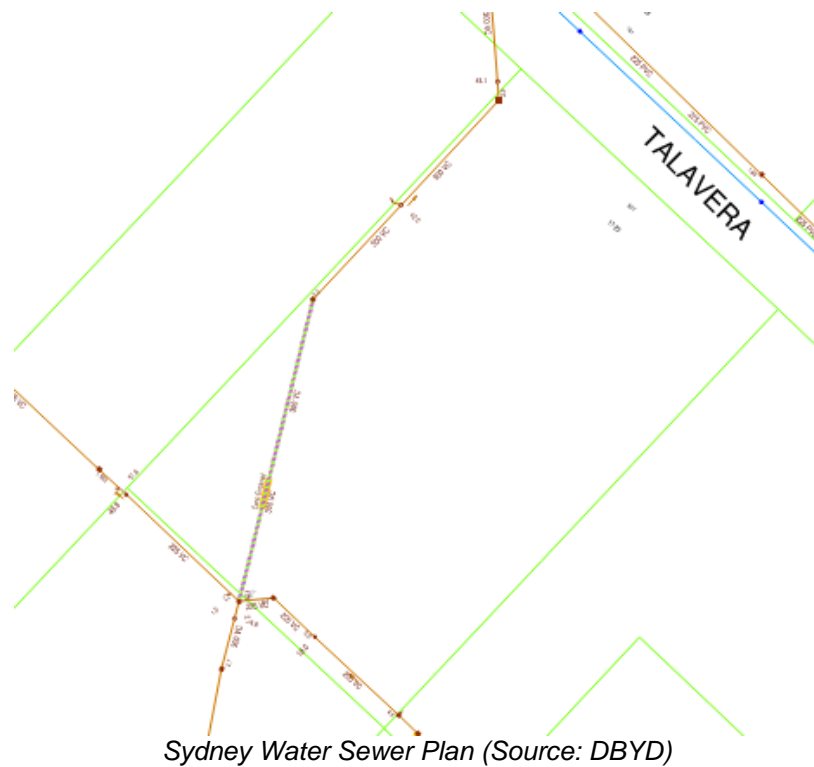
Sydney Water Feasibility Receipt

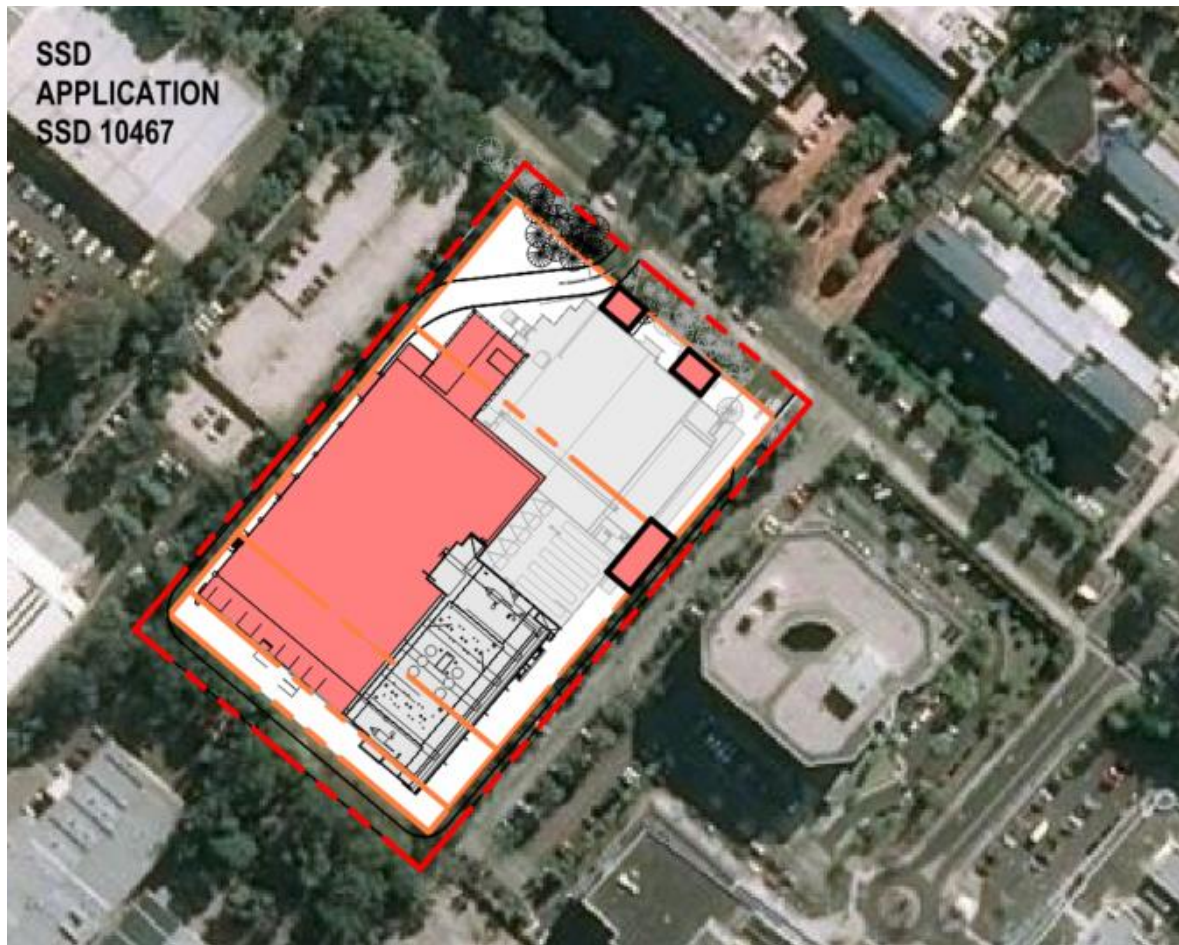
5.4 Sewerage

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 new IC3w works.

The 300mm diameter sewer main traversing through the site is currently concrete encased. (refer to below). 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 24/09/2021 to confirm Sydney Water's Infrastructure can cater for the new proposed waste demands (approx. 12 week process).





Site Location. Site extents shown in red – new building works in pink

OSD Tank 2 is located in the undercroft area of the IC3 East building. This tank has a capacity of approximately 203m³. This tank was oversized in anticipation of the additional flows to be detained from the IC3 West building works. This tank currently collects stormwater runoff from the roof areas of IC3 East.

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.

The below shows the location key stormwater drainage features on the site.



Architectural Site Layout Plan

Proposed Stormwater Drainage System

The proposed development will extend from the existing IC3 east build 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 10m (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 IC3 East and has been maintained for IC3 West development.

The balance of the under-croft area will have a minimum head height of 2.5m ranging up to 4.5 meters 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 Councils 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.

The roof drainage system will be designed to drain the 1% AEP storm. The inground drainage system will be designed to convey the 5%AEP storm in accordance with Australian Standards and Council requirements.

The below shows how the IC3 west development will integrate with the existing drainage system.



Architectural Site Layout Plan

5.6 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 2D flow analysis of the proposed conditions has been undertaken. For further details of this refer to Northrop's Flood Impact Assessment.

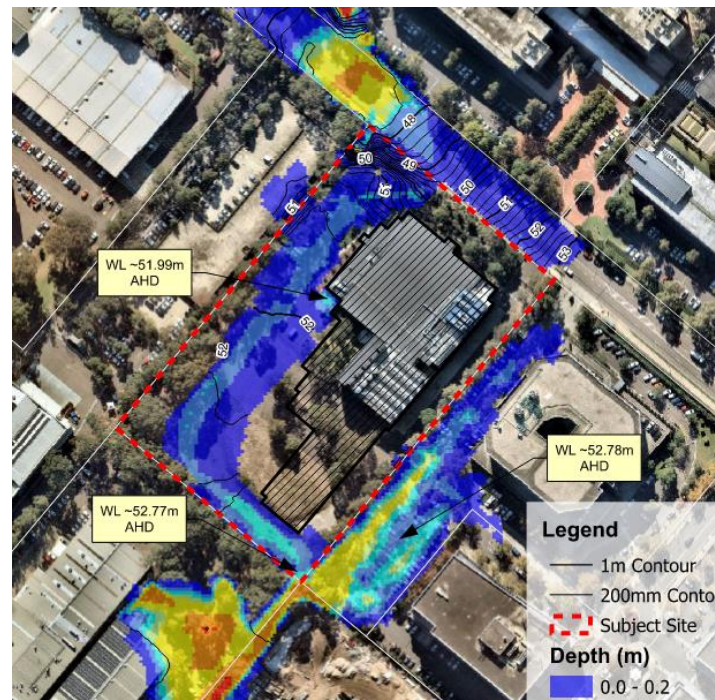
Northrop has conducted extensive flood modelling to determine flood extent and depths for the PMF and 1%AEP flood events. Northrop demonstrated that the IC3 East building and subsequent modifications to surface gradings allow overland flow to pass through the site with appropriate freeboard during the 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 undercroft area such that flood waters could flow under the building.

This concept is being maintained for the IC3 West development where the entire building is elevated above the floodway.

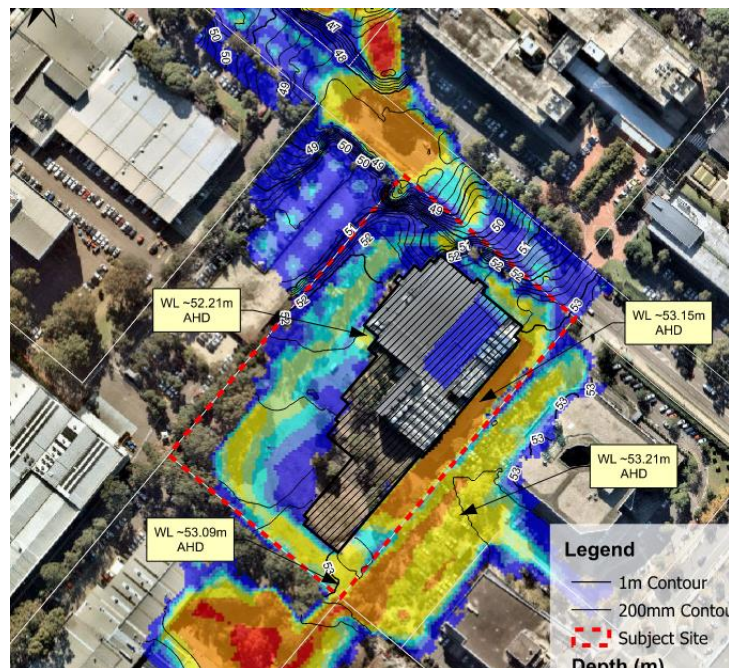
Addition of a 6m wide internal access road along the western boundary will provide additional area for overland flow with the likely reducing flood depths and ultimately flood hazards across the site. A flood wall approximately 1.0m high will be required along the western boundary to contain floodwaters within the site.

A flood study will be required to demonstrate that acceptable outcomes can be achieved. This flood study will be based on the agreed method of analysis and quantity of flow with Ryde Council as part of the flooding submission supporting the development consent for IC3 East.

The below shows the agreed flooding regimes that will be maintained as part of the IC3 West development.



1%AEP Flood Conditions to be Maintained



PMF Flood Conditions to be Maintained

5.7 Construction

The proposal will be delivered as follows:

- Construction is anticipated to commence 2023. A detailed construction delivery and staging plan would be developed by the construction contractor prior to the commencement of construction. The detailed construction and staging plan would describe the dates of commencement and anticipated duration for the construction of each key project element.
- Site preparation and site establishment including set up of restricted areas, hoardings and other safety measures including traffic management measures and construction controls.
- Site compounds established
- Connection to services, including potable water, wastewater, electricity and communications would be undertaken at agreed stages during construction. Minor power use will be required during construction. The use of portable water will be minimised and construction use limited to small amounts for potable use, dust suppression and washing of hard surfaces for safety management.
- Commence construction to agreed scope and programme
- Installation of security measures
- Site commissioning and testing. Commissioning will include testing all elements of the development including safety, quality systems and processes.
- Sign off from relevant infrastructure authorities to be obtained as relevant
- Following commissioning, the construction stage will be complete. The site will move into business as usual operations.

Appendix A - Pressure and Flow Statement

Statement of Available Pressure and Flow

50 Pitt Street
Sydney, 2000

Pressure & Flow Application Number: 277835

Property Address: 17-23 Talavera Road, Macquarie Park 2113

The expected maximum and minimum pressures available in the water main given below relate to modelled existing demand conditions, either with or without extra flows for emergency fire fighting, and are not to be construed as availability for normal domestic supply for any proposed development.

ASSUMED CONNECTION DETAILS

Street Name: Talavera Road	Side of Street: North
Distance & Direction from Nearest Cross Street	230 metres East from Khartoum Road
Approximate Ground Level (AHD):	50 metres
Nominal Size of Water Main (DN):	200 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	57 metre head
Minimum Pressure	47 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	47
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	5	48
	10	48
	15	47
	20	47
	26	47
	30	46
	40	45
	50	44
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	5	47
	10	47
	15	47
	20	46
	26	46
	30	46
	40	45
	50	44
Maximum Permissible Flow	118	32

(Please refer to reverse side for Notes)

For any further inquiries regarding this application please email :

swtapin@sydneywater.com.au

General Notes

This report is provided on the understanding that (i) the applicant has fully and correctly supplied the information necessary to produce and deliver the report and (ii) the following information is to be read and understood in conjunction with the results provided.

1. Under its Act and Operating Licence, Sydney Water is not required to design the water supply specifically for fire fighting. The applicant is therefore required to ensure that the actual performance of a fire fighting system, drawing water from the supply, satisfies the fire fighting requirements.
2. Due to short-term unavoidable operational incidents, such as main breaks, the regular supply and pressure may not be available all of the time.
3. To improve supply and/or water quality in the water supply system, limited areas are occasionally removed from the primary water supply zone and put onto another zone for short periods or even indefinitely. This could affect the supply pressures and flows given in this letter. This ongoing possibility of supply zone changes etc, means that the validity of this report is limited to one (1) year from the date of issue. It is the property owner's responsibility to periodically reassess the capability of the hydraulic systems of the building to determine whether they continue to meet their original design requirements.
4. Sydney Water will provide a pressure report to applicants regardless of whether there is or will be an approved connection. Apparent suitable pressures are not in any way an indication that a connection would be approved without developer funded improvements to the water supply system. These improvements are implemented under the Sydney Water 'Urban Development Process'.
5. Pumps that are to be directly connected to the water supply require approval of both the pump and the connection. Applications are to be lodged online via Sydney Water Tap in™ system - Sydney Water Website – www.sydneywater.com.au/tapin/index.htm. Where possible, on-site recycling tanks are recommended for pump testing to reduce water waste and allow higher pump test rates.
6. Periodic testing of boosted fire fighting installations is a requirement of the Australian Standards. To avoid the risk of a possible 'breach' of the Operating Licence, flows generated during testing of fire fighting installations are to be limited so that the pressure in Sydney Water's System is not reduced below 15 metres. Pumps that can cause a breach of the Operating Licence anywhere in the supply zone during testing will not be approved. This requirement should be carefully considered for installed pumps that can be tested to 150% of rated flow.

Notes on Models

1. Calibrated computer models are used to simulate maximum demand conditions experienced in each supply zone. Results have not been determined by customised field measurement and testing at the particular location of the application.
2. Regular updates of the models are conducted to account for issues such as urban consolidation, demand management or zone change.
3. Demand factors are selected to suit the type of fire-fighting installation. Factor 1 indicates pressures due to system demands as required under Australian Standards for fire hydrant installations. Factor 2 indicates pressures due to peak system demands.
4. When fire-fighting flows are included in the report, they are added to the applicable demand factor at the nominated location during a customised model run for a single fire. If adjacent properties become involved with a coincident fire, the pressures quoted may be substantially reduced.
5. Modelling of the requested fire fighting flows may indicate that local system capacity is exceeded and that negative pressures may occur in the supply system. Due to the risk of water contamination and the endangering of public health, Sydney Water reserves the right to refuse or limit the amount of flow requested in the report and, as a consequence, limit the size of connection and/or pump.
6. The pressures indicated by the modelling, at the specified location, are provided without consideration of pressure losses due to the connection method to Sydney Water's mains.