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SSDA Civil Engineering Report Incorporating Water Management Plan

6-8 Julius Avenue Data Centre

Prepared for ISPT c/o Logic Projects Co. / 11 July 2025

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Rev	Date	Prepared By	Approved By	Remarks
1	15/05/2025	AM	CR	For SSDA (DRAFT)
2	23/05/2025	AM	CR	For SSDA
3	20/06/2025	SF	CR	For SSDA
4	11/07/2025	AM	CR	For SSDA

1.0 Executive Summary

This civil engineering report has been prepared by Taylor Thomson Whitting (TTW) to accompany a detailed State Significant Development Application (SSDA) for the data centre development at 6-8 Julius Avenue, North Ryde NSW 2113 (the Site). The site is legally described as Lot 89 in Deposited Plan (DP) 1082131 with approximate area of 28,630m².

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the project (SSD-80018208) and forms a central component of the Integrated Water Management Plan.

This report concludes that the proposed development is suitable, will not result in unacceptable impact, and warrants approval subject to implementation of the following proposed mitigation measures:

- A site-wide in-ground stormwater pits and pipes network;
- Two on-site stormwater detention (OSD) tanks with combined volume of 655m^3 to reduce the discharge from the site to the permissible site discharge allowed in the City of Ryde (CoR) Development Control Plan (DCP) 2014 Part 8.2: Stormwater Management Technical Manual;
- Stormwater treatment measures including 10 x OceanProtect Oceanguards (or similar approved equivalent) and 21 x 690mm Ocean Protect PSorb StormFilters (or similar approved equivalent) to meet the pollutant reduction targets set out in the CoR DCP 2014 Part 8.2: Stormwater Management Technical Manual;
- A wastewater design in alignment with the Sydney Water mandated requirements;
- A firewater design in alignment with Fire and Rescue NSW requirements; and
- An erosion and sediment control plan to manage stormwater quality and quantity on site during the construction phase of the development.

Following the implementation of the above design measures, any impacts will be acceptable and appropriate.

2.0 Introduction

This civil engineering report has been prepared to accompany a detailed SSDA for the proposed Julius Avenue Data Centre development at 6-8 Julius Avenue, Ryde (SSD-80018208).

The application seeks consent for construction and operation of a data centre development and includes site preparation works, bulk earthworks and infrastructure, and construction of the buildings, ancillary facilities, and associated site works. The application also includes the delivery of one internal road.

The Julius Avenue Data Centre is a secure, scalable, and sustainable facility within the Macquarie Park Technology Precinct. Designed to meet Tier III Uptime Institute standards, the data centre will provide high-performance infrastructure that ensures continuous operations while adapting to evolving technological needs. The project is committed to aligning with local planning regulations and incorporating environmentally responsible design.

A key priority is future proofing, ensuring the facility can scale efficiently to accommodate increasing data demands. Security and reliability are integral, with redundant power and cooling systems, advanced cybersecurity, and robust access controls.

The development must address site constraints such as zoning laws, environmental considerations, and infrastructure requirements. As part of a major commercial and technology hub, the project must comply with local council guidelines, implement stormwater management solutions, and ensure seamless integration with existing transport and utility networks. Upgrades to electricity, water, and telecommunications will also be necessary to support the facility's extensive operations.

From a technical standpoint, the facility's design will follow industry best practices, incorporating structurally robust data halls, energy-efficient cooling systems, secure perimeters, and fire-resistant materials. The layout will emphasize operational efficiency, featuring modular data halls, structured cabling, emergency exits, and designated areas for storage, security, and support services. Additionally, the data centre will implement waste management strategies and adhere to strict Australian building and environmental standards.

The Julius Avenue Data Centre will be a cutting-edge facility that integrates innovation, security, and sustainability. This document serves as a comprehensive guide for all stakeholders, ensuring the project is executed with efficiency, compliance, and long-term value while also providing the technical requirements for the development of the data centre.

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 20 February 2025 issued for the SSDA (SSD-80018208). Specifically, this report has been prepared to specifically respond to the SEARs requirements issued under Table 1 below.

Table 1: SEARS Requirement

SEARs Item	Description of Requirement	Section Reference (this Report)
13	**Water Conditions**	
13.2	Provide a Surface Water Impact Assessment that assesses potential impacts on surface water resources (quality and quantity) including related infrastructure, hydrology, dependent ecosystems, drainage lines, downstream assets and watercourses.	Section 10.1
14	**Water Management**	
14.1	Provide an Integrated Water Management Plan for the development that:	
14.1.1	• Is prepared in consultation with the local council and any other relevant drainage or water authority.	Section 3.0
14.1.2	• Outlines the water-related servicing infrastructure required by the development (informed by the anticipated annual and ultimate increase in servicing demand) and evaluates opportunities to reduce water demand (such as recycled water provision).	Refer to the Infrastructure Delivery, Management & Staging plan prepared by IGS
14.1.3	• Details the proposed drainage (stormwater and wastewater) design for the site including any on-site treatment, reuse and detention facilities, water quality management measures, and the nominated discharge points, on-site sewerage management, and measures to treat, reuse or dispose of water.	Refer to Section 6.0 for details of proposed stormwater design. Refer to Section 9.0 for the wastewater and reuse design details prepared by ARUP as Hydraulic Engineer
14.1.4	• Demonstrates compliance with the local council or other drainage or water authority requirements and avoids adverse downstream impacts.	Section 3.0, 6.0, 10.0, 11.0
14.2	• Where drainage infrastructure works are required that would be handed over to the local council, or other drainage or water authority, provide full hydraulic details and detailed plans and specification of proposed works that have been prepared in consultation with, and comply with the relevant standards of, the local council or other drainage or water authority.	The proposed drainage does not include works that would be handed over to the local Council or other water authority. However, despite not connecting directly into City of Ryde, discharge methodology has been configured in consultation with Council as noted in Section 3.0
15	**Flooding**	
	Identify the flood planning level as set out in the relevant council LEP or SEPP and identify any: • flood risks on site having regard to adopted flood studies • the potential effects of climate change, and • any relevant provisions of the NSW Flood Risk Management Manual.	Flooding items covered in the Flood Impact Risk Assessment issued by TTW.

	• Where the development is occurring on flood prone land a flood impact and risk assessment (FIRA) must be prepared having regard to the Flood Impact and Risk Assessment Guideline - LU01 (FIRA guide). When determining the scope and category of the FIRA the requirements outlined in the FIRA guide must be considered.	
	• Detail any flood risk management measures that are to be incorporated as part of the development having regard to relevant guidelines (including any design solutions, flood modification measures, property modification measures, operational procedures or Flood Emergency Response Plan).	

2.1 Reference Documents

The following documents have been reviewed and referenced in preparing this report:

Standards and guidelines:

- City of Ryde Council DCP 2014;
- Landcom NSW Managing Urban Stormwater Soils and Construction (The “Blue Book” Vol. 1 and Vol. 2);
- NSW Water Sensitive Urban Design (WSUD) Guidelines;
- Australian Standard AS3500.3:2025 Plumbing and Drainage: Stormwater Drainage;
- Australian Standard AS3500.2:2021 Sanitary plumbing and drainage
- Australian Rainfall and Runoff (ARR) 2019;

Design inputs by others;

- Architectural documentation by Greenbox Dated April 2025;
- Landscape documentation by Arcadia Dated April 2025;
- Geotechnical Investigation Report (Ref No. 233059.00) by Douglas Partners Dated 11 March 2025;
- Survey by Beveridge Williams Dated 14 March 2025.

3.0 Stakeholder Engagement

Consultation with CoR council has commenced in relation to the proposed stormwater management works and relevant civil engineering design. A summary of these is provided below in Table 2.

Table 2: Stakeholder Engagement

Relevant Stakeholder	Date	Items Discussed	Resolution
City of Ryde Council	Email correspondence in February 2025	Email correspondence regarding OSD parameters, stormwater connection points and potential location of overland flow discharge configuration.	Civil design adjusted accordingly to suit the guidance from council in relation to OSD parameters, potential discharge methodology, and the need for engagement with NSW National Parks and Wildlife Service to sign off on a 'level spreader' configuration. Refer to Appendix B for council correspondence.
City of Ryde Council	In person 'General Consultation' meeting held on 10 March 2025	The civil specific items discussed in this session are as follows: - Stormwater attenuation and discharge strategy. - Flood modelling requirements. - Access roadway requirements	Stormwater discharge strategy is to ensure that 'state-of-nature' is maintained as best as possible with a level spreader. The Flood Modelling has progressed with council's TUFLOW file in order to produce a Flood Impact Risk Assessment. Council have confirmed the design requirements for the access roadway as per the minutes in Appendix B.

4.0 The Site

The site is located at 6-8 Julius Avenue, North Ryde and is legally described at Lot 89 in Deposited Plan (DP) 1082131. It is located between Rivett Road & Richardson Place and is approximately 28,630m^2 in size. An aerial photograph of the site is provided at Figure 4-1.

The site is located in the City of Ryde (CoR) Local Government Area (LGA) within the Macquarie Park corridor, an established employment precinct with a particular focus on innovation. Macquarie Park is a nationally significant research and employment centre and includes the head offices for some of Australia's leading companies including Foxtel, Optus and FUJIFILM. The site is approximately 4.5km southeast of Macquarie University, and 4.0km southeast of Macquarie Shopping Centre.

The existing site is largely green field and undeveloped with a handful of small, enclosed buildings. The northern portion of site has a relatively level benched section before falling away steeply to the south.

Vehicle access to the site is currently provided from Julius Avenue via an existing access easement on the western boundary of the allotment. This easement is shared with the adjacent lot 10/DP876736.

There is also a vehicle access via the eastern cul-de-sac within 12/DP876736. This private road is provided as an extension of Richardson Place under an access easement (outlined in DP1003588) which nominates CoR council as a beneficiary. Therefore, under Section 88A of the Conveyancing Act (1919), this access extends to all members of the public. At the end of the cul-de-sac, a further easement is granted through the 6-8 Julius Avenue site providing vehicular access to the national park. This access also services various drainage and overhead electrical main easements.

The site is well serviced by public transport along Delhi Road including the newly complete North Ryde Metro station and the 514-bus route. The site is also situated within close proximity to Epping Road and the M2 Motorway.

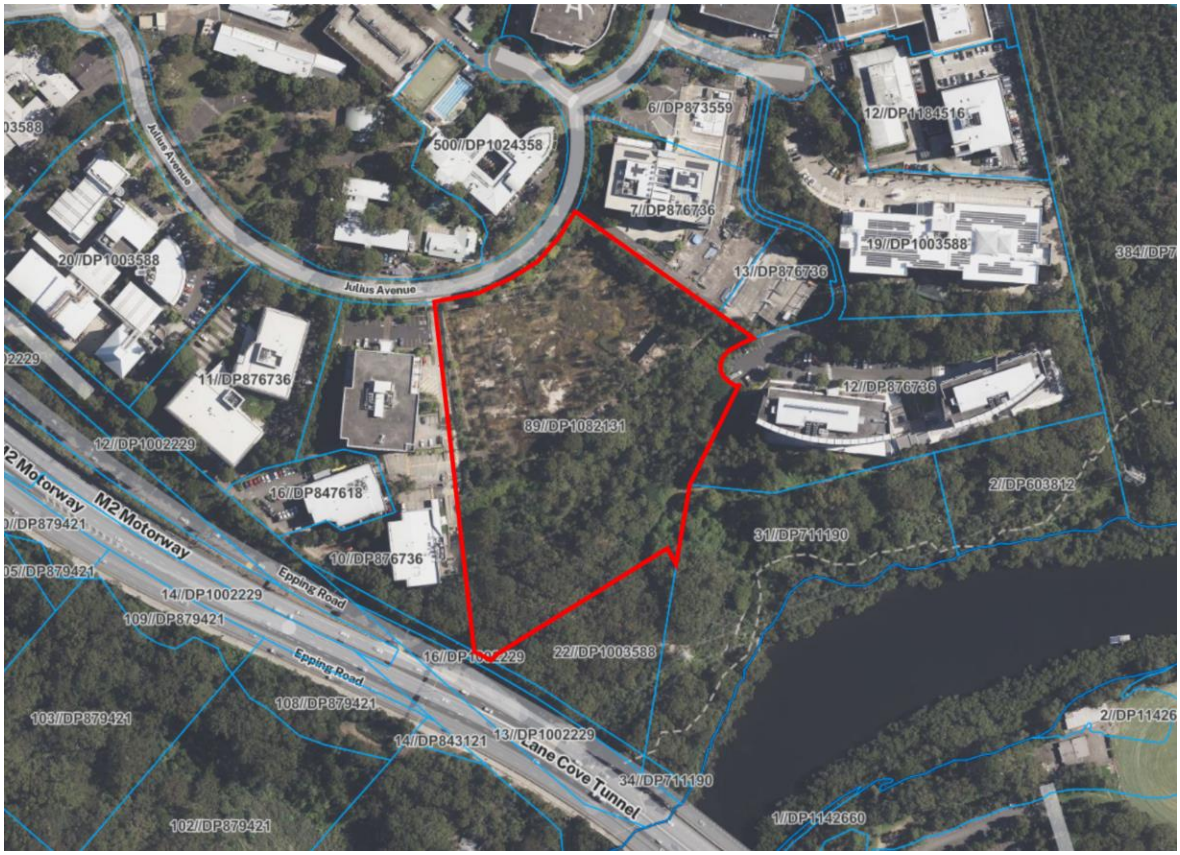

Figure 4-1: Aerial Photograph of Existing Site (Source: Urbis GIS 2023)

5.0 Proposed Development

The proposed development will comprise basement car parking and tank rooms, two data halls, an electricity generation gantry designed to accommodate 12 generator units, a loading dock, associated landscaping, an access road connecting the existing road to the west with Richardson Place cul-de-sac to the east, and a separate Ausgrid Sub-Transmission Switching Station (STSS) along with a main switchboard room.

The proposed site layout is shown in Figure 5-1 below.

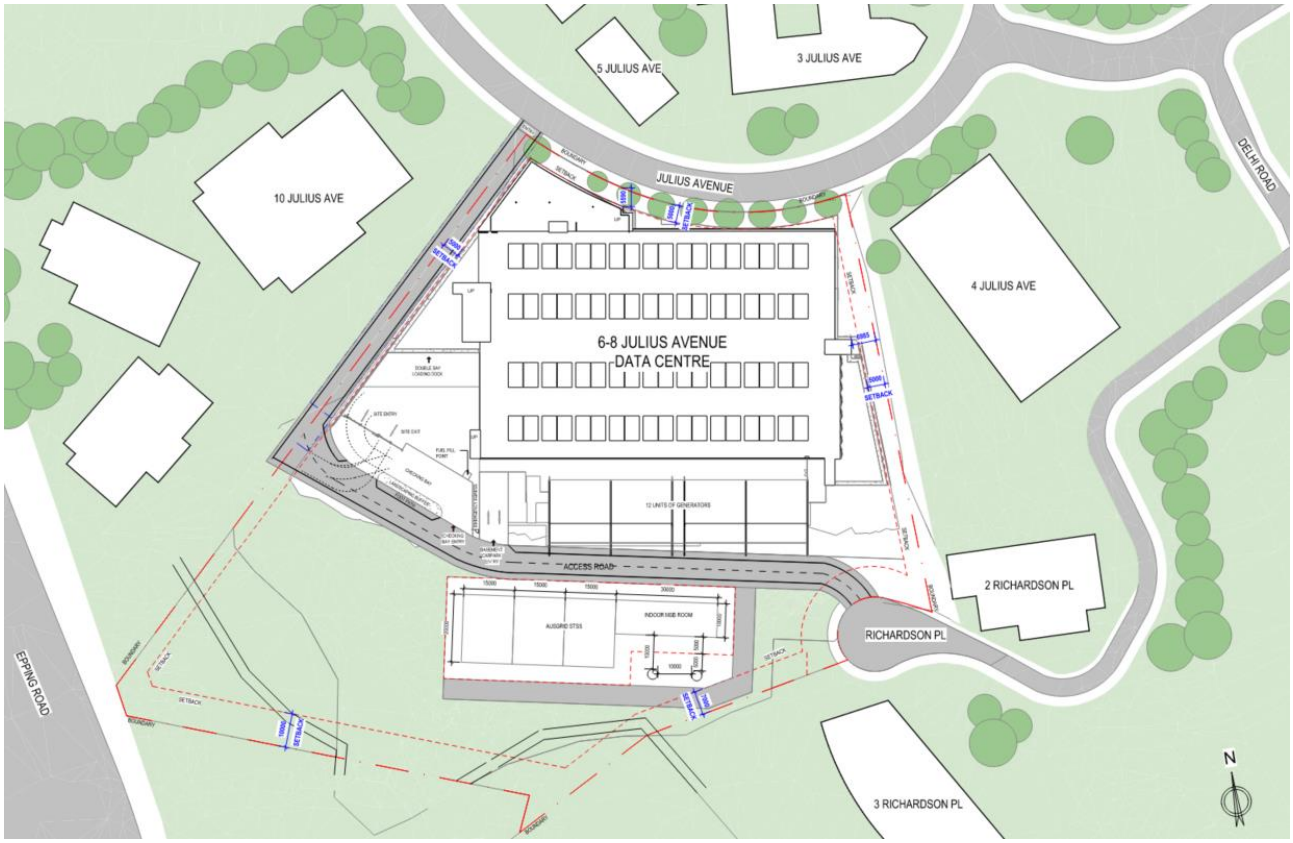

Figure 5-1: Site Plan (Source; Greenbox)

6.0 Stormwater Methodology

6.1 Review of Existing Stormwater

The existing site is approximately 28,630m^2 and is 100% pervious as shown in Figure 6-1**.** The site is comprised of entirely undeveloped vegetation and some exploratory geotechnical excavations. The site generally falls from the northwest to the southeast. The existing Richardson Place cul-de-sac stormwater drainage pipe network (in the southeast) conveys a large portion of the existing stormwater catchment between the CoR council building in the south and Delhi Road in the north. This existing stormwater network is shown indicatively below in Figure 6-1.

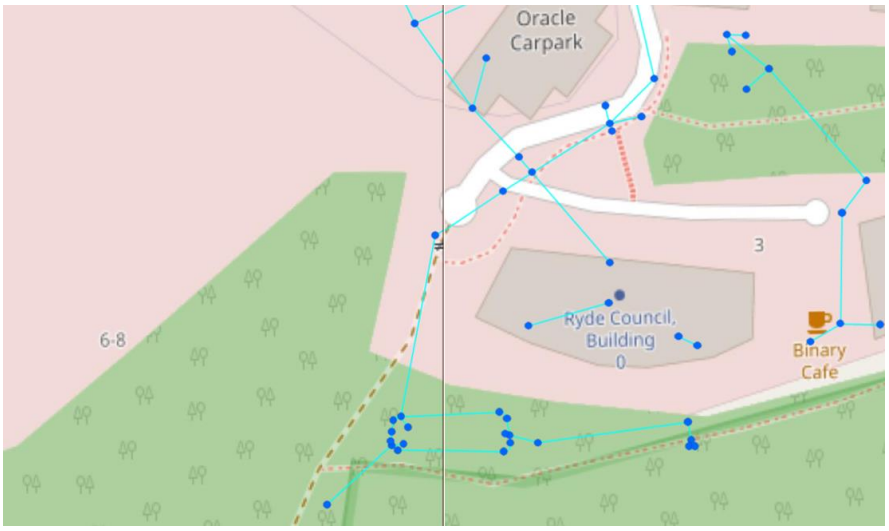

Figure 6-1: Existing Drainage Infrastructure Plans- SW Corner (Source: CoR Council drawings, BYDA)

Stormwater discharge from Richardson Place flows into an existing detention basin situated to the south of council's head office building. This basin then discharges via an overflow weir into an overland flow path and eventually into the Lane Cove River. See Figure 6-2 below.

Figure 6-2: Existing Drainage Infrastructure Imagery-SW Corner (Source: CoR Council Drainage Officer-Council Correspondence)

6.2 Proposed Stormwater Design

Stormwater has been designed in accordance with the CoR DCP 2014 and the Stormwater Management Technical Manual 2014. As outlined in Section 1.4.4 (Figure 6-3) below, outflows from the site for all design storms are required to be less than the maximum outflow for the uncontrolled post-development site in the 5-year Annual Recurrence Interval (ARI) which is equivalent to the 20% Annual Exceedance Probability (AEP) storm event.

1.4.4 OSD Design - Detailed Method

The detailed method must be used in the following circumstances;

- Where the development does not satisfy the requirements for the simplified method above.
- Where Council considers the nature of the receiving system is too sensitive to warrant the simplified approach.
- Where the site conditions vary from those given in the simplified method.

The OSD must be designed to ensure the level of stormwater runoff discharged from the area of development must not to exceed the peak stormwater discharge arising from the post-developed works, during a 5 year ARI storm event.

To restrict post development flows to pre-development levels a detention basin for the design storms will be required to be modelled. Computational methods based on the approximate triangular method or the rational methods are not acceptable. It is recommended that a program in accordance with Section 3.1 is used.

In cases where the site proposes discharge to the kerb and gutter, the point of discharge is to be limited to 30L/s in accordance with Section 1.3.1.

If the rate of discharge from the outlet of the OSD system is affected by tail water conditions from the receiving system, for example where the invert level of the orifice is lower than the surface level at the point of connection into the existing drainage system, then full hydraulic calculations will be required in accordance with Section 5 of this Manual.

Figure 6-3: Stormwater Management Technical Manual (CoR DCP, 2014)

Roof catchments will be collected in roof gutters and conveyed by downpipes to an in-ground pipe system. Surface stormwater flows have been conveyed by site grading and collected by Surface Inlet Pits (SIP). In-ground stormwater is conveyed to the OSD system and water quality treatment devices.

All proposed stormwater are required to discharge via level spreaders or energy dissipaters to ensure that runoff is evenly distributed over a broad area, reducing the potential for concentrated flow paths that could cause erosion or localised flooding. This will also help mimic the natural sheet flow conditions, promoting infiltration and maintaining the site's hydrological balance. This requirement applies to all drainage outflows associated with the development and has been incorporated into the overall stormwater management strategy. Refer to the attached civil engineering drawings in Appendix A for details of the proposed stormwater management.

6.2.1 On-site Stormwater Detention (OSD)

Council have confirmed that the proposed OSD system must only attenuate and maintain the 5-year ARI (20% AEP) pre-development flows for the portion of site being redeveloped. Thus, the southern portions of site being maintained as dense forested land can be omitted from the Permissible Site Discharge (PSD) calculation and modelling. The proposed development covers an area of approximately 20,750m², which is about 7,880m² less than the overall site area.

The proposed development will include two OSD tanks to meet the discharge requirements set by the council. The first tank, located within the basement, has an effective storage volume of 524 m³ and discharges toward the southwest side of the proposed access road. The second tank, with an effective volume of 131 m³, is

positioned beneath the access road adjacent to the STSS and MSB room, discharging to the eastern area near Richardson Place. Both proposed OSD tank outlets will discharge through level spreaders. The proposed OSD and drainage plan has been modelled through the program DRAINS in line with council requirements.

6.2.2 DRAINS Modelling

The preliminary DRAINS model illustrates the flow dynamics from both the uncontrolled post-development catchment and the post-development catchment with OSD systems, as well as to review the overland flow regime in for capacity and adequacy in the major storm event. The OSDs have been designed to capture runoff from all roof catchments as well as the hardstand and landscaped areas. The eastern end of the access road has been treated as bypassing the proposed OSD tanks. The stormwater catchment plan is indicatively shown in Figure 6-4 below for the developed area of the site. This will be further developed as the design progresses.

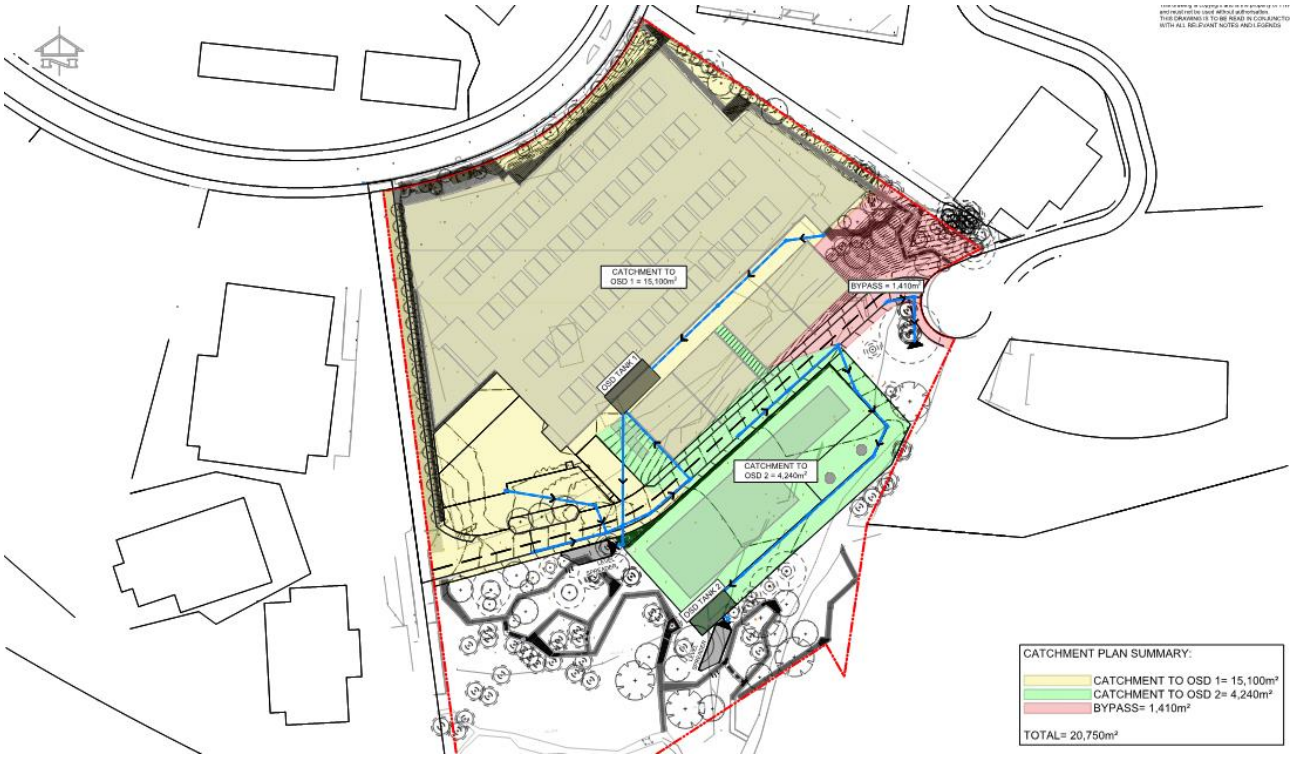

Figure 6-4: Stormwater Catchment Plan

Based on the DRAINS model, the 20% AEP outflow from the uncontrolled post-development catchment is 416 L/s, which represents the permissible site discharge (PSD). As shown in Figure 6-5, the outflows from the OSD systems during the 1% AEP storm are 252 L/s and 70 L/s, with an additional 89 L/s bypass. This results in a total site discharge of 411 L/s. As this total discharge remains below the PSD, the proposed design is considered compliant and acceptable.

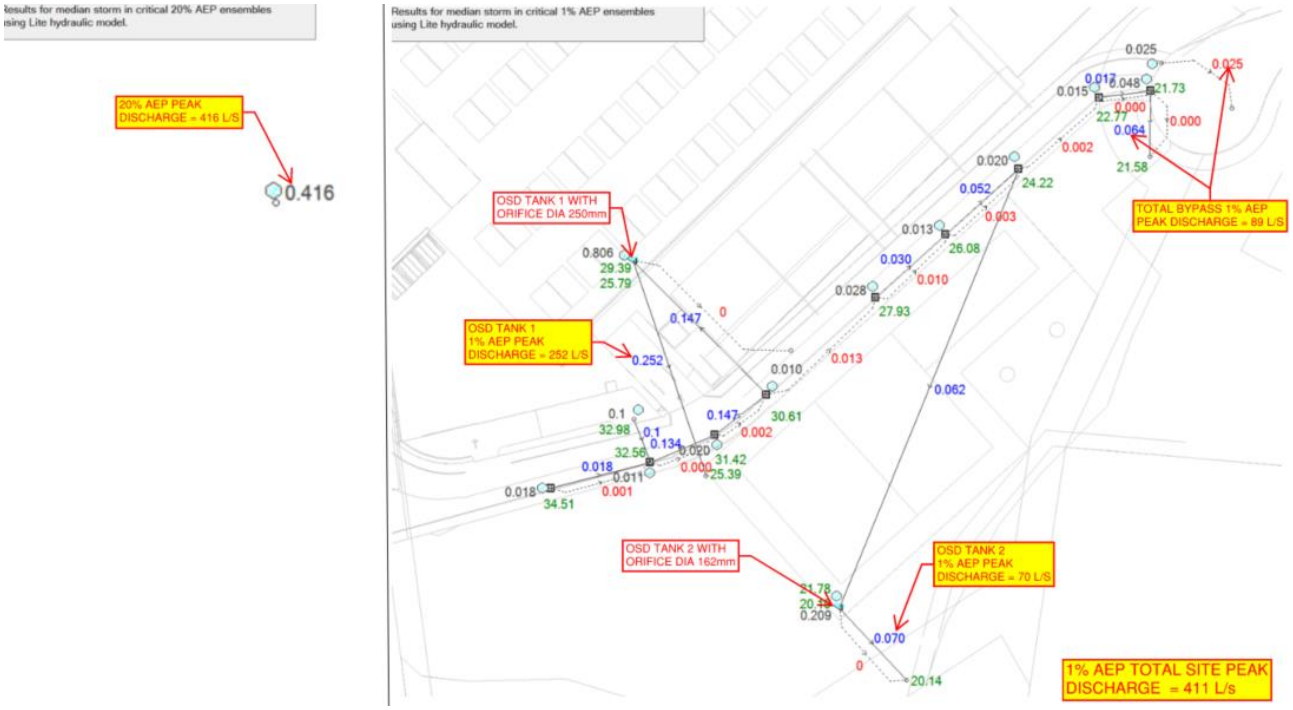

Figure 6-5: DRAINS Schematic Results 1% AEP Storm

6.3 Stormwater Quality

Stormwater quality treatment is required to comply with the requirements outlined in the CoR DCP 2014 Part 8.2 - Stormwater and Floodplain Management Section 3.3 (WSUD Controls). Within this, water quality treatment devices on site must achieve the water quality targets outlined in Section 3.3.1.b of the Stormwater and Floodplain Management guide which are shown in Figure 6-6.

b. WSUD measures incorporated into the development must satisfy the following pollutant target controls;

WSUD Stormwater Quality Performance Targets

Gross Pollutants	90%
Total Suspended Solids	85%
Total Phosphorus	60%
Total Nitrogen	45%

Figure 6-6: Water Quality Targets (Source: City of Ryde Stormwater and Floodplain Management guide, 2014)

Stormwater quality reduction targets and maintenance of treatment measures can be met through a combination of the following treatment options;

- *Constructed Wetlands (preferred over bioretention basins and ponds)*
- *Operation and Maintenance Plan*
- *Trash racks (preferred over GPTs)*
- *Ocean Protect StormFilter Cartridges (or equivalent)*
- *Ocean Protect Oceanguard Pit Inserts (or equivalent)*
- *Rainwater reuse tanks*
- *Swales, bioretention swales and buffer strips*
- *Bioretention basins*
- *Raingardens*

6.3.1 Stormwater Quality Post Construction

Stormwater runoff from the site is proposed to be treated through a combination of a rainwater reuse tank, pit-insert filter baskets, and filtration cartridges. For modelling purposes, a 230kL rainwater tank has been incorporated to harvest runoff from all roof surfaces.

Overflow from the rainwater tank will discharge to the filter chamber within the OSD tank. Stormfilter cartridges are to be provided within the OSD filter chamber and will be used to target pollutant loads. Additionally, surface runoff from external hardstand and landscaped areas will be collected via surface inlet pits and treated through OceanGuard filter baskets before being conveyed to the OSD filter chamber.

The site has been subdivided into catchments, and a corresponding treatment train has been developed for each catchment. Refer to Figure 6-7 below for the detailed catchment breakdown.

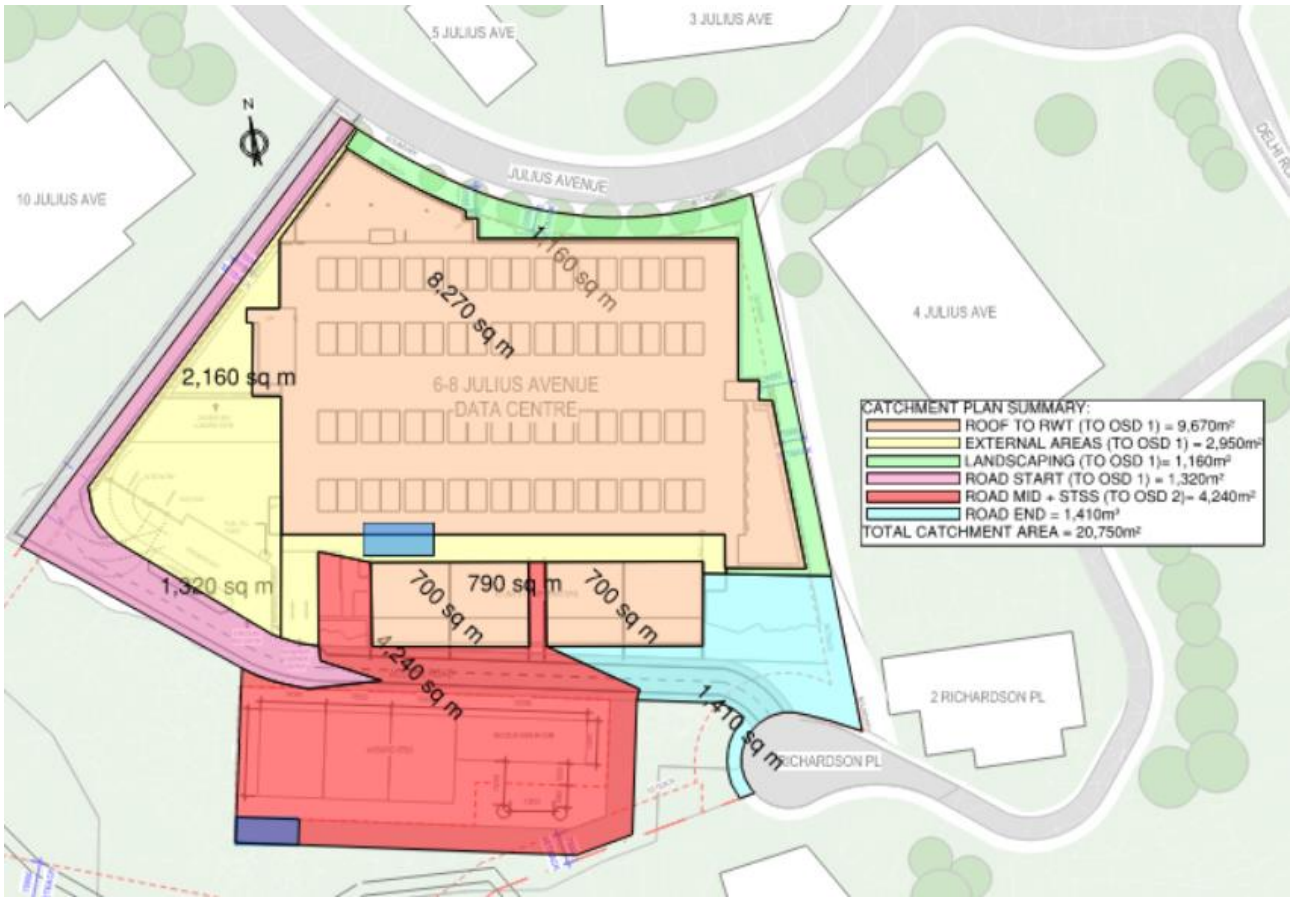

Figure 6-7: Catchment Plan

A preliminary MUSIC (Model for Urban Stormwater Improvement Conceptualisation) model was used to conceptualise stormwater treatment measures that could achieve the water quality targets required by CoR council. The treatment train proposed for the site used to model MUSIC has been provided in Figure 6-8.

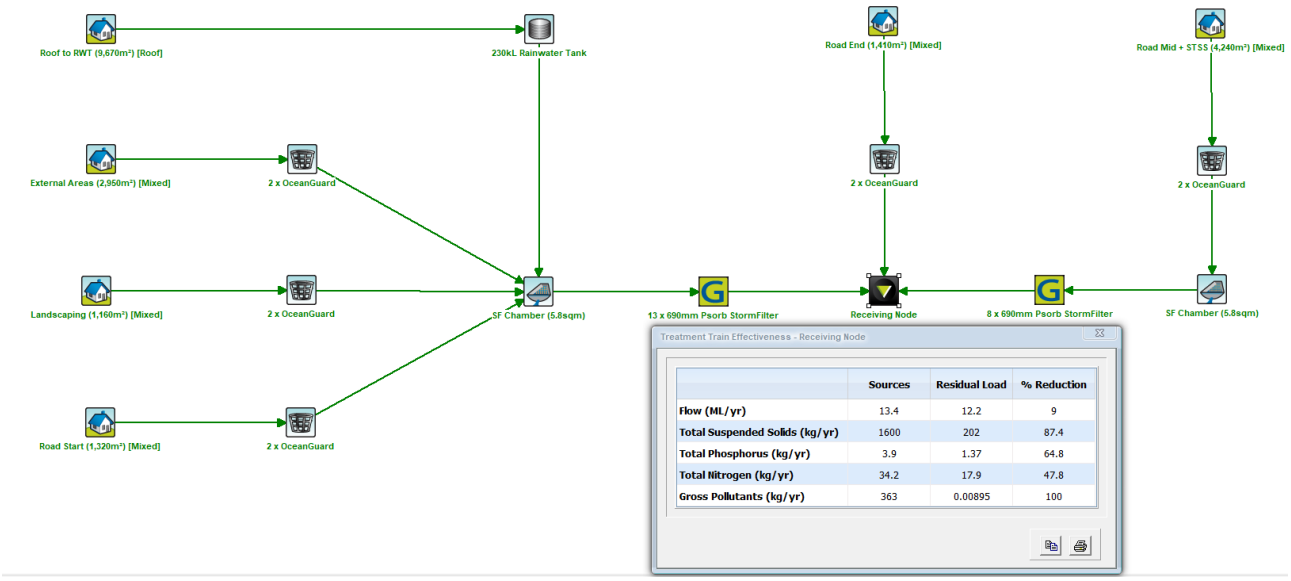

Figure 6-8: MUSIC Treatment Train and Results

The details of each catchment and treatment are tabulated below:

Table 3: Catchment Details and Respective Treatments

Catchment	Area (m²)	Impervious Area (%)	Treatment	
Roof (to RWT)	9,670	100	230kL RWT	13 x 690mm PSorb Stormfilter
External Areas	2,950	100	2 x Ocean Guard	
Landscaping	1,160	100	2 x Ocean Guard	
Road Start	1,320	100	2 x Ocean Guard	
Road Mid + STSS	4,240	100	2 x Ocean Guard	8 x 690mm PSorb Stormfilter
Road End	1,410	100	2 x Ocean Guard	

The assumed impervious areas and catchment sizes are preliminary and will be refined as the landscape design progresses. As the developed and impervious areas are further detailed, the proposed treatment train will be updated accordingly.

The effectiveness of the proposed treatment train combination has been assessed using the MUSIC model, with the results compared against the CoR council's pollutant reduction targets. This assessment was

undertaken to confirm that the proposed stormwater treatment measures adequately meet the required water quality objectives.

The results of the MUSIC model are tabulated below.

Table 4: MUSIC Modelling Results

Pollutant	Min. Required Reduction (%)	Modelled Reduction (%)
Total Suspended Solids (TSS)	85	87.4
Total Phosphorus (TP)	60	64.8
Total Nitrogen (TN)	45	47.8
Gross Pollutants (GP)	90	100

Given the above results, all four parameters have met council's water quality targets. Pollutant loads from the proposed development have been significantly reduced for total suspended solids, total phosphorus, total nitrogen and gross pollutants relative to existing.

6.3.2 Stormwater Quality During Construction

During construction stage of the project while the site is disturbed, erosion prevention and sediment control measures will be installed and maintained until construction is completed. Erosion and sediment control measures will be required to comply with:

- City of Ryde Council Development Control Plan 2014
- Managing Urban Stormwater – Soils and Construction 'Blue Book', Volume 1, 4th Edition, Landcom

A sediment fence will prevent silt and waste being washed into neighbouring sites and streets. It can be integrated with safety fencing. A catch drain with straw bales will be utilised to carry and treat site runoff which will then be captured by a stabilised earth basin with a total volume of 1,186m³, that will be installed at the low point of site excavation. At the point of entry to site, stabilised access will be required to ensure that vehicles and machinery leave the site with clean wheels. Pits will have geotextile inlet filter or mesh and gravel inlet filter installed to prevent silt from entering the stormwater system during construction.

The stabilised earth basin is intended for use during the early stages of construction to manage site runoff prior to bulk excavation and building works across the site. As construction progresses and the site becomes developed as well as access to that portion of the site restricted, the basin will be reduced and eventually decommissioned in accordance with the ESCP, and alternative sediment control measures will be implemented as part of the staging strategy. A reduced basin may be implemented with the addition of flocculants to accelerate settling of sediment.

Refer to the drawing no. TTW-00-DR-CI-02101 in Appendix A for the Erosion and Sediment Control Plan and Appendix C for the sediment basin calculation.

7.0 Site Works Methodology

7.1 Bulk Earthworks

Bulk earthworks on the site will be required to facilitate the development of the site for the proposed multi-storey data centre and surrounding roads and landscapes. Excavation advice provided by Douglas Partners in the geotechnical investigation report highlights the following points:

- A working platform will be necessary if heavy plant, such as piling rigs or large cranes, are to be operated on site.
- An assessment of ground conditions must be undertaken in accordance with the Federation of Piling Specialists (UK) guidelines.
- Excavation contractors are required to conduct an independent “excavatability” assessment (as referenced in the DP report) prior to tendering for excavation works.
- Rock saws should be utilised to minimise vibration impacts and prevent potential damage to adjacent existing services and structures.
- Appropriate excavation methods and equipment must be selected to ensure that ground-borne vibration levels remain within acceptable limits.
- A vibration trial should be conducted using the intended excavation equipment before bulk excavation begins. Monitoring of nearby building footings may be necessary depending on the excavation methods employed.
- All exposed rock faces must be inspected by a geotechnical engineer to confirm consistency with design assumptions, assess stability, and provide advice on any required support measures.
- Excavations are recommended to be inspected at every 1.5 m vertical drop in excavation height, or every 1.0 m where excavations extend below adjacent infrastructure.
- Temporary lateral support, such as rock bolts, dowels, or ground anchors, may be required where unstable rock slivers, blocks, wedges, or feather-edged joints are identified in excavated faces.
- The permanent building structure must be designed to provide long-term support to the basement rock face. Alternatively, permanent rockbolt support will need to be installed. This proposal will be developed during detailed design.

For further information, refer to the original report by Douglas Partners.

7.1.1 Cut and Fill Volumes

A high-level cut and fill estimate has been completed for the site and is shown in drawing no. TTW-00-DR-CI-03101 in Appendix A. The assessment determined the following volumes shown in Table 5. Overall, the balance totals a net cut of 67,623.49m^3.

Table 5: Cut and Fill Volume Analysis

TOTAL	Volume (m³)
Cut	-69,292.58
Fill	1669.09
Net (Cut)	-67,623.49

Note, the bulk earthworks plan excludes detailed excavation. It is a preliminary estimate which is subject to adjustment to allow for variances in geotechnical conditions, allowable building height, and drainage conditions.

7.2 Pavement Design

The design of external pavements within the site will be undertaken by TTW to ensure they provide adequate strength and safety for both pedestrian and vehicular movements. It is recommended that site-specific California Bearing Ratio (CBR) testing be carried out by the geotechnical engineer to establish the appropriate CBR value for use in the pavement design. Whilst noted that a large majority of the site area is exposed sandstone, some sections of the unexcavated land will potentially require CBR analysis.

Pavements subject to vehicular traffic will need to be designed to accommodate the proposed design vehicle loads and anticipated vehicular movements. An indicative external pavement design has been provided in Drawing No. TTW-00-DR-CI-07501; however, this is subject to final confirmation of the dry weight of any equipment to be installed within the STSS, as well as the anticipated cumulative traffic load (measured in Million Standard Axles, MSA) along each section of the external vehicular pavement.

The proposed pavement plan for the site, subject to detailed design, is included in Appendix A. Refer to drawing no. TTW-00-DR-CI-07101 for details.

8.0 Flooding

A series of flood diversion pipework networks will be required to ensure that key design criteria for afflux (maximum of 10mm increase in flood water level) is maintained for the development. For reference, the schematic pipe layout is shown on drawing 241920-TTW-00-DR-CI-04101.

At detailed design stage, the flood diversion design should be cognisant of minimising impact on the existing trees/landscaping as well as the proposed landscape design and access requirements.

Please refer to Flood Impact Risk Assessment issued by TTW for key findings.

9.0 Wastewater and On-site Sewerage Management

9.1 Sewer

A new single sewer connection is required to service the building. Through early design coordination with Sydney Water via S73 Notice of Anticipated Requirements (NoAR), it nominated the reconstruction of an existing manhole through a Water Services Coordinator (WSC) major works contract. This would facilitate the installation of a single industrial connection over the 225mm sewer main running along the southern boundary.

Through early consultation with Sydney Water, it has been confirmed that the expected loads for the new development (peak site discharge rate of up to 7.6L/s) can be accommodated within the capacity of the existing downstream 225mm dia sewer infrastructure pipe. Sydney Water will confirm this with the Water Services Coordinator during design development.

The limitation of 7.6L/s discharge to the sewer network instigates the requirement to retain on-site the difference of peak 9.0 L/s (1.5L/s difference) flow to be held / attenuated during the day and discharged overnight during off-peak periods (2400hrs – 0600hrs). During this time, the site will discharge at a higher rate of approximately 14.5L/s subject to Sydney Water Notice of requirement negotiations ongoing at this time.

Further survey and discussions with Sydney Water, via the Water Services Coordinator appointed by the Principal, are ongoing and are required to continue to determine the full extent of the required works on behalf of Sydney Water. The WSC is responsible for liaising with Sydney Water to seek approvals and finalise the infrastructure connection requirements for the works. Detailed requirements and formal approvals for any connection, deviations, extensions or amplifications will be provided by Sydney Water once a Section 73 Notice of Requirements is received by the Water Services Coordinator (Vinculum) appointed by the Principal.

Refer to SSDA appendix 29 Infrastructure Services report for details of utility interface and Sydney Water correspondence during the SSDA design phase.

The development is to be provided with multiple segregated drainage systems including soil waste (sanitary drainage) mechanical wastewater drainage and fire water containment drainage in accordance with the requirements of the Plumbing code of Australia and AS3500.2, including referenced documents.

9.2 Fire Water Containment / Detention

A dedicated fire water drainage system has been integrated to direct fire water to a detention tank upon activation of any sprinkler control valve serving a space containing lithium-ion batteries (energised, de-energised, or otherwise) as per Dangerous Goods assessment requirements. Contractor shall install heavy duty trench channel drain across all doorways into data halls and connecting plant corridors and battery rooms as detailed on hydraulic documentation.

There is a provision of an above-ground free-standing fire water containment tank within basement plant room to capture internal fire water run off during fire events. The total effective volume of the tank is 312 KL.

The volume of the fire detention tank has been investigated and rationalised for the reduction of the volume subject to the fire engineer's agreed scenario strategy. Fire water containment design volume calculation is based on the following benchmarked scenario from consultation with FRNSW:

- Consider a fire scenario involving three (3) server racks incorporating batteries in strict compliance with FMDS 5-32.
- Activation of four (4) sprinkler heads each with flow rate of 1.6 L/s. **Should any deviation from requirements of FMDS 5-32 with respect to batteries within server racks be introduced, the entire area of sprinkler operation shall be considered.**
- 2 fire hydrants flowing simultaneously (20 l/s) for a period of 4 hours in line with requirements of AS 2419.1:2021. 4-hour operation considered by FRNSW to be appropriate due to:

- Risk of re-ignition associated with batteries particularly post de-activation of sprinklers (after 60 mins). This is evident in FMDS large scale testing of battery racks results indicating re-ignition post sprinkler deactivation and fire durations of more than 3 hours.
- To facilitate cooling of adjacent racks (preventing fire spread beyond the 3 initial racks).
- Provision of a contaminated fire water containment tank of **minimum 312 kL** based on above calculated figures.

The fire water containment tank is designed as a standalone system to collect the water discharged during an internal fire event only, from the data halls and the battery rooms via trench grates installed at the exit doors to capture the water and convey it via gravity to the detention tank. A reflux valve to be installed upstream of the tank to prevent the tank water from surcharging back into the lowest data hall during the tank overflow.

The fire detention tank is to have an overflow pipe discharging to OSD tank subject to further coordination and approval by the Civil engineer and FRNSW. Externally attacked fire scenario water and entrained debris will drain to the site OSD tank complete with outfall isolation valve to isolate the flow of potentially contaminated water from site.

The fire containment detention tank is to have a camlock connection against an external wall of the carpark for truck emptying.

10.0 Cumulative Impacts

10.1 Surface Water Impact Assessment

The proposed development will have negligible impact on the existing surface water conditions as the design intends to match the existing drainage scenario and reduce the flows. OSD system and overland flow paths will reduce flows from the site which will enhance protection of the downstream ecology. Further, the introduction of water quality treatment will protect the receiving bodies from the pollutants introduced by increased impervious surfaces.

As such, the proposed drainage design will not adversely impact downstream ecosystems, nor impact existing hydrological systems.

11.0 Mitigation Measures

The following mitigation measures shown in Table 6 below are to be implemented as outlined in this report to minimise the impact of the proposal on the receiving system.

Table 6: Mitigation Measures

Mitigation Measure	Design
Erosion and Sediment Control	The proposed development is to implement measures as documented generally in accordance with NSW Department of Housing Managing Urban Stormwater as shown in drawing no. TTW-00-DR-CI-02101.
Stormwater Management	Provision of OSD tanks systems, water quality treatment measures, and rainwater tank reuse as part of a WSUD as documented on this report and on TTW's civil engineering drawings attached in Appendix A.
Surface Water Impact Assessment	The proposed stormwater management strategy as discussed and as shown in the civil engineering drawings attached in Appendix A are to be implemented to ensure that the development has no impact on downstream drainage lines, assets, ecosystems, or existing hydrological systems. Refer to Section 10.1 for further details.

12.0 Conclusion

This report provides a summary of the Integrated Water Management requirements to support the SSDA submission for the proposed Julius Avenue Data Centre development.

Stormwater is required to comply with the relevant standards and requirements of the CoR council as outlined in the DCP. The site discharge rate will be reduced to 411 L/s, which is lower than the 20% AEP pre-development flow rate of 416 L/s, through the implementation of two OSD tank system with a combined effective volume capacity of 655 m³. WSUD is to be targeted by rainwater reuse tank, 10 x Ocean Protect's Oceanguard surface inlet pit inserts (or similar approved equivalent) and 21 x 690mm Ocean Protect's PSorb Stormfilter cartridges (or similar approved equivalent) to meet council's minimum pollutant reduction rates.

Based on the above, the proposed stormwater drainage works comply with the council's DCP requirements. We recommend that the civil and stormwater works for the proposed development be generally in accordance with the civil engineering drawings shown in Appendix A.

The sewer and wastewater design parameters and allowances are broadly in alignment with FRNSW design parameters and feedback from initial engagement with Sydney Water. These elements are covered further in the Arup Hydraulic drawing package shown in Appendix D.

The findings in this statement are based on current available information, regulations and correspondence undertaken at the time of writing.

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Appendix A

SSDA Civil Engineering Drawings

Appendix B

CoR Council Correspondence

Appendix C

Sediment Basin Volume Calculation

Appendix D

Arup Hydraulic Design Drawings