

Dangerous Goods Compliance Report

SYD02 Data Centre

Prepared for: LCI Consultants Pty Ltd

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Revisions

Revision	Description	Date	Prepared by	Approved by
A	Schematic Design (SD)	30 October 2024	Aleksandar Bajagic Junelle Llorente	Daniel Lay
B	SSDA Mod2 Issue	17 October 2025	Aleksandar Bajagic	Scott Tamasauskas
C	SSDA Mod2 Issue Following Client Feedback	27 October 2025	Aleksandar Bajagic	Scott Tamasauskas

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Abbreviations

Abbreviation	Description
ACOR	ACOR Consultants Pty Ltd
ADG	Australian Dangerous Goods
ADG Code	Australian Code for the Transport of Dangerous Goods by Road & Rail
ALARP	As low as reasonably practicable
AS	Australian standard
AS/NZS	Australian/ New Zealand standard
DG	Dangerous goods
ERP	Emergency response plan
MHF	Major Hazard Facility
Mod1	Modification 1
Mod2	Modification 2
n/a	Not applicable
PG	Packing Group
PPE	Personal protective equipment
SDS	Safety data sheets
SEPP 33	State Environmental Planning Policy No. 33
UPS	Uninterruptible power supply
WHS	Work Health and Safety

Definitions

Terms	Definition
Category 3 tank	Rectangular tanks and tanks with unconventional shapes, intended principally for industrial use above-ground as either head tanks or storage tanks.
Combustible liquid	Any liquid, other than a flammable liquid, that has a flash point, and has a fire point that is less than its boiling point. For the purpose of this Standard, combustible liquids are divided into two classes as follows: Class C1 - A combustible liquid that has a closed cup flash point of greater than 60°C and no greater than 93°C. (dangerous goods for storage) Class C2 - A combustible liquid that - has a flash point of greater 93°C; or has been excluded from being a flammable liquid by any of the criteria for sustaining combustion. (non-dangerous goods)
Flash point	The lowest temperature, corrected to a barometric pressure of 101.3 kPa, at which application of a test flame causes the vapour of the test portion to ignite under the specified conditions of test.
Ignition source	A source of energy sufficient to ignite a flammable atmosphere. Examples of ignition sources include naked flames, exposed incandescent material, electrical welding arcs, mechanical sparks, and electrical discharge due to static electricity.
On-site protected place	A building where people are employed within the property boundary, including offices, warehouses, manufacturing or processing areas, amenities, and other dangerous goods stores where quantities exceed minor storage.
Public place	Any place other than private property, open to the public, which the public has a right to use, and which includes a public road
Reasonably practicable	That which is, or was at a particular time, reasonably able to be done to ensure health and safety, taking into account and weighing up all relevant matters including: (a) the likelihood of the hazard or the risk concerned occurring. (b) the degree of harm that might result from the hazard or the risk. (c) what the person concerned knows, or ought reasonably to know, about the hazard or risk, and ways of eliminating or minimising the risk. (d) the availability and suitability of ways to eliminate or minimise the risk. (e) after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.
Safe Fill Level	The capacity of the tank up to the maximum safe filling height of the tank as per statutory requirements; AS1940 requires below 95%.
Screen Wall	A structurally sound wall that: ▪ is impervious to liquid or vapour; ▪ is constructed of materials that are substantially resistant to attack by the dangerous goods being stored; and ▪ may act as a shield or deflection barrier.
Separation	Keep substances physically apart by distance

Criteria

This review and assessment were carried out based on the following criteria:

1. Legislation:

- Work Health and Safety (WHS) Act 2011
- Work Health and Safety Regulation 2017
- Code Of Practice Managing Risks of Hazardous Chemicals in the Workplace (2019)

2. Codes of Practice:

- AS 1940-2017: The storage and handling of flammable and combustible liquids
- AS 1692-2006: Steel tanks for flammable and combustible liquids
- AS 4681-2000: Storage and handling of Class 9 (miscellaneous) dangerous goods and articles
- AS ISO 31000:2018: Risk Management – Guidelines
- FM Global Insurance Property Loss Prevention Data Sheet 5-32, Data Centres and Related Facilities
- FM Global Insurance Property Loss Prevention Data Sheet 5-33, Electrical Energy Storage Systems
- AS IEC 62619:2023 – Secondary cells and batteries containing alkaline or other non-acid electrolytes
Safety requirements for secondary lithium cells and batteries, for use in industrial applications

Limitations

ACOR has prepared this compliance review on the information provided by LCI Consultants in relation to the storage quantities, locations, and design layout at the Mod2 SSDA design stage of the project. It remains the responsibility of LCI and DCI to ensure that the installation meets the requirements, and implement the controls, as required by the relevant legislation.

The following information has been provided for this assessment:

- SYD02_DCI Data Centre_Basis of Design Report_19/09/2025_Rev C
- 4531-01-AR—0101_30/09/2025_06
- 4531-01-AR—1201_30/09/2025_03
- SYD02_Development DCI DC_Electrical Specification_19/09/2025_C
- 240521_S02-EL-00-DRG-LCI-4060_19/09/2025_02
- Email received from LCI 02/10/2025 – Re: SYD02 - SSDA Dangerous Goods Report Coordination

Notes:

- This report and findings are not a substitute for full compliance with Australian standards and relevant Codes of Practice. LCI shall ensure that they maintain their duty of care and consult the relevant legislation and guidelines.
- All information obtained is provided to LCI for verification and acceptance prior to being published.

Should the storage conditions, or volumes, change, the contents and findings in this report shall be reviewed, and the risks associated with any change assessed and controlled.

Methodology

The methodology for this review was to evaluate the proposed layout, quantities, hazard controls and identify any areas of concern or non-compliance with the Act, Regulations and Australian Standards. The following steps were undertaken:

- An assessment of proposed DG facilities for compliance with relevant standards and codes, with particular focus on risk control measures specified in the Regulations, including:
 - Spill or leak containment
 - Segregation of incompatible dangerous goods
 - Protection from impact
 - Transferring dangerous goods
 - Ignition sources in hazardous areas
 - Control of hazardous atmospheres
 - Design, build, maintenance and location of storage or handling systems
 - Containers for bulk dangerous goods
 - Lighting
 - Access and egress
 - Security at a dangerous goods site
 - Control of fire hazards
 - Placards
 - Training
 - Emergency management planning
 - Inventory, manifest and site plan.
- Document and review the hazards associated with non-compliance or other hazards identified.
- Provide recommendations to address non-compliances.

Note: All information obtained is provided to the client for verification and acceptance prior to being published.

1 Introduction

1.1 Purpose of the Report

LCI Consultants Pty Ltd (LCI) has engaged ACOR Consultants Pty Ltd (ACOR) to undertake a Dangerous Goods compliance review of the proposed diesel storage system and lithium batteries system for the SYD02 Data Centre and assist them with dangerous goods safety and compliance with regulations.

Dangerous goods are substances that may pose an immediate hazard to people, property and/or the environment. They may be flammable, combustible, oxidising, water-reactive, toxic or corrosive. It is important that dangerous goods are appropriately identified and stored correctly.

This report outlines the general storage requirements for C1 combustible liquids and the Lithium-ion battery rooms. It provides design recommendations to ensure compliant and safe storage and handling at the SYD02 Data Centre.

1.2 Background

The SYD02 Data Centre is being constructed at an existing site owned by DCI known as the Eastern Creek facility, with the existing Data Centre SYD01. It is located on 90 Peter Brock Drive, Eastern Creek, 2766, NSW, approximately 35 km west of Sydney CBD. The facility is undergoing an extension designed by LCI for DCI which will incorporate an expansion of the Data Centre and add new combustible liquid storage tanks to support the Data centre.

The data centre is to be 5 storeys as per the basis of design 'SYD02_DCI Data Centre_Basis of Design Report_19/09/2025_Rev C'.

There will be an additional 6 x 120kL bulk fuel tanks and 52 x 1000L day tanks as per 240521_S02-EL-00-DRG-LCI-4060_19/09/2025_02.

The general concept layout can be seen in Figure 1 below.

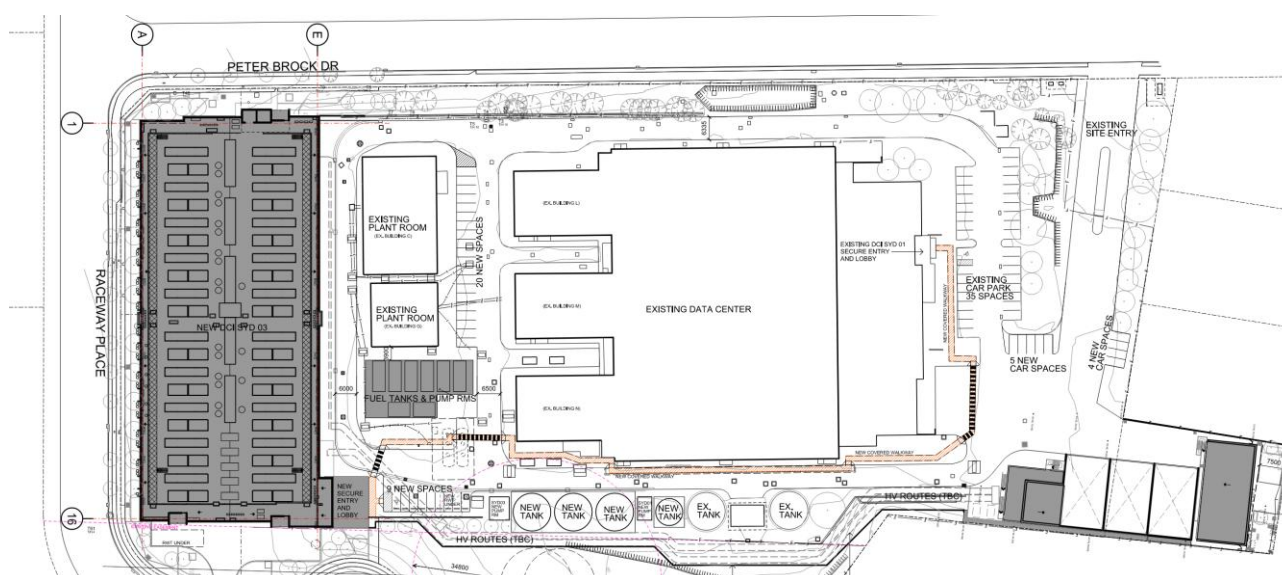


Figure 1. Proposed Layout for SYD02

SYD01 has two (2) bulk underground fuel tanks. The six (6) new bulk fuel tanks which will be used to fuel the day tanks inside the new data centre building (SYD02) and will be located above ground adjacent to the data centre. Each day tank will individually power a generator set within the Data Centre, with 23 generators on the lower

ground floor, 23 generators on the upper ground floor and 6 generators on level 3 as per 240521_S02-EL-00-DRG-LCI-4060_19/09/2025_02.

Each of the generators will service a battery enclosure and as such there are 23 battery enclosures on the lower ground floor, 23 on the upper ground floor and 6 on level 3.

The NSW Department of Planning and Environment has approved the Mod1 Water Storage Re-arrangements for the Eastern Creek Data Centre on 18/09/2025, application number SSD-21342738-Mod-1.

2 Objective

The objective of this report is to provide a dangerous goods compliance review of the proposed Mod2 schematic design of the diesel fuel system and battery storage system located at the SYD02 Data Centre, against the defined criteria, identify any non-compliances, and provide recommendations that will assist LCI in complying with the regulatory requirements.

3 Scope

The scope of this report is to provide design guidance for the diesel storage facility and associated lithium-ion batteries in relation to dangerous goods storage and handling. Controls for identified hazards are reviewed, in conjunction with LCI and in line with the requirements of the Regulations and any applicable Codes of Practice. Engineering recommendations are also provided in Section 6.11 to assist LCI with the design.

Mod1 for the SYD02 data centre has already been approved 18/09/2025 in relation to rearrangements for water storage in application number SSD-21342738-Mod-1. As such the scope of this report is in reference to the Mod2 application only.

The scope includes the following areas:

- Diesel Fuel Generator System
 - 6 x 120 kL aboveground diesel fuel bulk storage tanks (ground level, external to the building)
 - 2 x diesel fuel fill points (off-loading areas, ground level)
 - 52 x 1,000 L diesel generator day tanks (23 x lower ground level, 23 x upper ground level & 6 x level 3)
 - 2 x 5,000 L aboveground return fuel tanks (ground level)
- Lithium Battery UPS Rooms
 - 42 x UPS battery enclosures (18 x lower ground level, 18 x upper ground level & 6 x level 3)
 - 10 x Mech battery enclosures (5 x lower ground level, 5 x upper ground level)
- Lithium Battery Storage for Secondary Data Centre Systems
 - Unknown amount or sizing at current design stage

4 Site Assessment

4.1 Basis of the Assessment

- The proposed fuel system specification, given in this report, is based on diesel fuel that has a flash point greater than 60°C but not greater than 93°C and a fire point less than its boiling point. This fuel is classified as a C1 combustible liquid, in accordance with the definition given in AS 1940:2017. Where the tank is to contain any other product, where the product is classified as flammable liquid, the design outlined herein is no longer applicable.
- The day tanks are classified as Category 3 rectangular tanks as per AS 1940:2017, based on the design, location and intended use specified by the designer.
- The assessment is based on the schematic design of the fuel and battery systems.
- Based on the drawings received, listed in the Limitations section, it is assumed that the preliminary specification of the bulk fuel and day tanks are:
 - Designed to AS 1940 and AS 1692
 - Double walled tanks.
- The generator enclosures will be designed with two access points.
- The generator enclosures will be located at the lower ground level, upper ground level and level 3 of the Data Centre building.
- Lube oil class (C2) is not considered as dangerous goods and not regulated by SafeWork NSW, thus is not included in this assessment.
- Lithium-ion batteries (Class 9) are present on site.
- The UPS and Mech battery enclosures where lithium-ion batteries are in a circuit and considered to be in use, are not considered dangerous goods for storage and handling compliance purposes.
- Additional lithium-ion batteries stored on site for secondary data centre systems are not in use and therefore considered as dangerous goods.
- The substation design and compliance shall be met by the electrical designer. Only grid transformer compliance covered in AS 1940 shall be reviewed within this report.

4.2 Facility

The SYD02 Diesel Fuel System is comprised of an additional:

1. Six (6) 120,000 L bulk fuel storage tanks
2. Two (2) 5,000 L return fuel tanks
3. Fifty-two (52) 1000 L day tanks, one provided for each genset (GEN-1-1, GEN-1-2...).

The SYD02 Data Centre emergency power supply is comprised of an additional:

1. Forty-two (42) diesel generators, one provided for each UPS section
2. Ten (10) diesel generators, one provided for each mech section.

These new fuel systems and power supply are for SYD02 and are additional to the infrastructure already existing in SYD01.

The proposed facility design is outlined as follows:

- The primary fuel supply system for the new data centre is located outside adjacent to the building where the bulk fuel tanks and return tanks will be kept above ground.
- There will be two (2) fill points for the bulk tanks as well as two (2) pump rooms. Going to and from the data centre day tanks there will be two (2) underground (trenched) fuel supply and 2 underground (trenched) return lines.
- The underground piping are to be separated from electrical cables to follow corresponding electrical standards. The piping should also be adequately protected from inadvertent penetration with the grating used on the trenches rated for vehicular traffic expected on site.
- The day tanks are located with the generators inside 40ft containers on the lower ground floor, upper ground floor and level 3 of the new data centre, with vents leading outside the building. The day tanks tank will be provided with a fill point and level indicator located within the generator enclosure.
- Diesel fuel will be circulated between the day tank and generator through an internal pipeline system. The fuel return line will be installed to send excess fuel back to the bulk fuel tanks through the pump rooms.
- Diesel will be supplied via a fuel tanker that is to be parked adjacent to the bulk fuel tank fill points. The access roadway is designed to accommodate a fuel tanker and allow additional vehicles to pass.
- The fuel tank capacities are shown in Table 1.
- In an email from LCI on 24/10/2025, it was noted that 140 kL of fuel is stored in the exiting data centre currently in 2 x 70 kL underground storage tanks.
- The facility also contains 52 x Battery rooms, consisting of Lithium-ion battery cabinets. These are spread out with 23 x battery rooms on the lower ground floor, 23 x battery rooms on the upper ground floor, and 6 battery rooms on level 3. In normal operation, the mains supply routes through the UPS but batteries do not discharge.
- In the event that mains supply is lost, the batteries will provide a time-limited power supply to support the data centre until the generators engage and pick up the data centre load. The batteries remain connected in a circuit, charging continuously to be ready for deployment, if required, and are considered to be 'in use' and therefore not a stored dangerous good. Hence, the batteries do not fall into the scope of this assessment. However, general storage recommendations have been provided throughout the report.
- The Lithium battery layout for UPS and Mech battery enclosures are outlined in Table 2.
- In an email from LCI on 02/10/2025, information was provided there may be some minor lithium-ion batteries stored for secondary data centre systems. The exact quantity or sizing of these batteries is currently unknown. As these batteries will be stored and not in use, they are considered as dangerous goods. Compliance requirements and recommendations have been provided for multiple storage sizes in this report.
- Table 3 lists the additional lithium batteries to be stored at the data centre.
- The data centre ground floor layout which shows the generator enclosure and battery rooms are depicted in Figure 2.

Existing batteries in the SYD01 data centre have not been considered for this report as cumulative storage for batteries will not affect the outcomes of this report. A previous dangerous goods report should have been completed to ensure compliance of the existing SYD01 data centre.

Table 1. Dangerous Goods Storage Locations and Quantities based on the supplied information

No.	Location/Area.	Tank Ref.	Tank Quantity	Chemical	Class / Division	Single Capacity	Combined Capacity
1	Ground Outside (Adjacent to SYD02)	SYD02 Bulk Fuel Tank	6	Diesel	C1	120,000 L	720,000 L
2		SYD02 Return Fuel Tank	2			5,000 L	10,000 L
3	Lower Ground Floor (SYD02)	Day Tank (UPS Generator)	18			1,000 L	18,000 L
4		Day Tank (Mech Generator)	5			1,000 L	5,000 L
5	Upper Ground Floor (SYD02)	Day Tank (UPS Generator)	18			1,000 L	18,000 L
6		Day Tank (Mech Generator)	5			1,000 L	5,000 L
7	Level 3 (SYD02)	Day Tank (UPS Generator)	6			1,000L	6,000L
Total storage quantity							782,000 L

Note: Tank capacity is based on the overfill level set point

Note: Currently there are 2 x 70,000 L underground storage tanks servicing the existing SYD01 data centre and are located across from the proposed bulk fuel storage area for Mod2. This is in addition to the proposed total storage quantity above.

Table 2. List of Lithium-Ion Storage

No.	Location/Area.	Battery Room Area Ref.	Room Quantity	Chemical	Class / Division	Average Single Room Capacity	Combined Capacity
1	Lower Ground Floor (SYD02)	UPS Battery Room	18	Lithium-Ion	non-DG	1,500 kg	27,000 kg
2		Mech Battery Room	5			1,500 kg	7,500 kg
3	Upper Ground Floor (SYD02)	UPS Battery Room	18			1,500 kg	27,000 kg
4		Mech Battery Room	5			1,500 kg	7,500 kg
5	Level 3 (SYD02)	UPS Battery Room	6			1,500 kg	9,000 kg
Total storage quantity							78,000 kg

Notes:

- Quantities are estimated based on typical Lithium-ion battery module weight.
- Lithium-ion batteries in the UPS and Mech battery rooms are not considered dangerous goods for storage and handling compliance purposes, as they are in a circuit and considered to be in use.
- Total storage quantity for modules includes lithium-ion, electrolyte, composites, aluminium and steel.
- These quantities are the new additions for the SYD02 facility and do not include existing storage for SYD01.

Table 3. List of Other Battery Storage

No.	Location/Type	Chemical	Class / Division
1	Secondary Data Centre Systems	Lithium-ion	Class 9

Notes:

1. The exact location and quantities of these batteries are to be determined prior to construction, and this DG report is to be reviewed and updated accordingly.
2. These batteries are assumed to be storage, not in use, and therefore are dangerous goods.

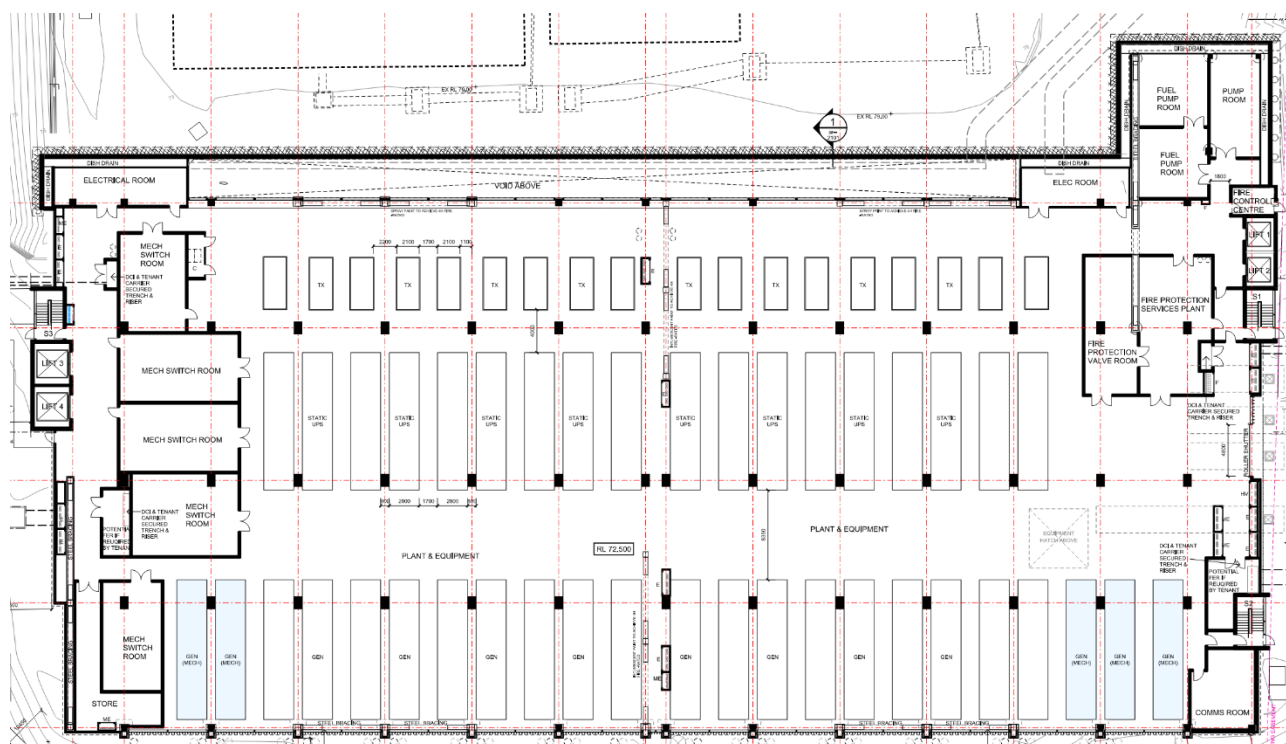


Figure 2. Generator Layout for SYD02 Ground Floor

5 Regulation Quantities of Dangerous Goods

Table 4. Manifest and Placarding Quantity Limits

Description of Dangerous Goods	Equivalent Description of Dangerous Goods	Packing Group	Placarding Quantity	Manifest Quantity	Client Quantity
Flammable liquid, Category 4	Combustible Liquids (C1) (flash point < 93 °C)	N/A	10,000 L	100,000L	922,000 L

Note: The existing SYD01 data centre is believed to have 140,000 L of diesel fuel storage and the new SYD02 data centre is proposed to have a total of 782,000 L of diesel fuel storage, resulting in the total cumulative client quantity of 922,000 L.

Note: Lithium-ion batteries are classified as Class 9 dangerous goods under the ADG Code. However, Class 9 is not recognised under the WHS regulations and Schedule 11 Placard and Manifest Quantities. Hence, the lithium-ion batteries are exempt from the dangerous goods regulations.

5.1 Placard and Manifest Quantities

The aggregate diesel tank storage exceeds manifest and placarding quantities as per Table 4. As a result, SafeWork NSW must be provided with a written notice, which includes the manifest prepared under regulation 347 together with an emergency plan as per regulation 361. In general, the facility must comply with the requirements of the WHS Regulations and SafeWork NSW.

5.2 Major Hazard Facility

The WHS Regulations state that the operator of the facility shall notify the regulator of Schedule 15 chemicals that are present or likely to be present at the facility.

The proposed SYD02 Data Centre stores and handles combustible liquid (diesel), which is not listed in Schedule 15. Hence, MHF requirements do not apply to the proposed facility.

5.3 State Environmental Planning Policy (Resilience and Hazards)

Diesel (Class 1 combustible liquid) will be stored aboveground without flammable materials and, by definition of (NSW Department of Planning, Hazardous and Offensive Development Application Guidelines, Applying SEPP 33 (2011)), is not considered potentially hazardous.

Class 9 (stored lithium batteries, not in use) are excluded from risk screening and are not considered to be potentially hazardous.

5.4 Lithium-Ion Batteries connected to the system

Lithium batteries (new or used) are classified as Class 9 dangerous goods during storage or transport, and risks may be managed by implementing the relevant clause in AS 4681:2000. This would include modules in storage and spent batteries in modules or individually stored.

In the SYD02 Data Centre, the lithium batteries in the UPS and Mech battery enclosures are used as secondary power backup and will be continuously connected to a circuit (on charge).

Work Health and Safety Regulation 2017, Chapter 7, Point 4

"4. Application of regulations, these regulations do not apply to —"

(a) hazardous chemicals in batteries when incorporated in plant,"

exempts dangerous goods in a battery, installed to supply energy to any plant. Once the UPS cabinet is installed, the lithium battery cells are exempt from the Work Safety and Health Regulations 2017.

6 Compliance requirements

6.1 Diesel Storage

6.1.1 Bulk fuel tanks

The proposed bulk diesel storage is a double-walled (self-bunded), aboveground tank which includes integral secondary containment, which has been designed to contain the entire contents of the primary tank.

The bulk fuel tanks should comply with the following key requirements as a minimum:

- The bulk fuel tanks shall be appropriately designed to AS1940:2017.
- The tank shall also be designed appropriately to AS1692:2006 with the primary and secondary containment wholly constructed of steel.
- Means shall be provided to determine the level or volume of the tank contents.
 - The normal fill level shall not exceed 95% of the tank capacity.
 - The tank shall be a high-level alarm (LAH) set at a maximum of 97% of tank capacity.
 - In addition to the high-level alarm (LAH), a physically and electrically independent high-high level alarm (LAHH) shall be provided.
- Means shall be provided to establish and monitor the integrity of the primary tank.
- Overfill protection shall be provided with a suitable alarm and means of stopping fluid flow.
- Means shall be provided to prevent release of liquid by siphon flow.
- All piping connections to the tank shall be above the normal maximum fill level.
- Adjacent tanks shall be separated by at least 600mm.
- The tanks shall be adequately protected from damage due to impact (i.e. provided with bollards or barrier).
- The tanks shall be provided with a free vent adequately sized considering the tank volume and the expected diesel flow rates. The vent shall terminate at least 4m from ground level, shall be separated from any building opening by at least 2m and shall be protected from ingress of foreign material.

6.1.2 Day tanks

The day tanks shall comply with the requirements of Service tanks as per Section 5.14 of AS1940:2017 and the following storage and handling requirements as identified for tanks located indoors:

- The day tanks are classified as Category 3 tanks, and therefore should also comply with Section 5.4.4 of AS1940 which states that the vent discharge for combustible liquids shall be located laterally by at least 2m from any opening into a building or a vent intake and at least 4m above ground level.
- Since the day tanks are located at a higher elevation than the bulk storage tanks, overflow piping to the bulk storage tanks shall be provided. The overflow pipe shall be sufficiently sized to return the full capacity of the pump to the bulk storage tank without spillage.
- Emergency shut-off provision shall be provided from the storage tank and service tank to the generator.
- An emergency shut-off device shall be provided and easily accessible on each pump.
- Provision shall be made to shut off the flow of liquid quickly in an emergency from the storage tank and service tank and to a tank vehicle fill point.

- The return system will incorporate at least two independent overfill shut-off devices, arranged such that each will continue to function to prevent an overfill in the event of failure of the other device.
- The 1000L (nominal) day tanks shall be:
 - Not interconnected;
 - Provided with means to contain the spread of any small leak or spill; and
 - Separate from each other, and any another tank, by at least 3m.
- The day tanks should be fitted with a high-level alarm set at a maximum of 97% and normal fill level set a maximum of 95% of the tanks' capacity.
- Lighting within the room provided during hours of operation, sufficient to enable a person to easily read all markings on signs, instruments and other necessary items. (Minimum value of 50 lx).

6.1.3 Fuel Piping

The fuel piping shall comply with AS1940:2017, AS4041:2006 and AS4897:2008. The key requirements are as follows:

- The piping shall be suitable for the expected working pressures, temperatures and structural stresses and the material shall be compatible with diesel.
- The following considerations shall be applied:
 - Accessibility during operation, testing, maintenance, replacement or drainage;
 - Support and fixing;
 - Exposure to mechanical damage, particularly at the tanker offloading area;
 - Corrosion protection, particularly for piping located outdoors or underground;
 - Integration with any cathodic protection;
 - Pressure and thermal relief;
 - Expansion and contraction of piping with site conditions;
 - Drainage for any trench in which pipes are laid;
 - Protection for any buried piping from superimposed loads or ground settlement;
 - Electrical bonding and earthing as per AS/ NZS 1020:2023 and AS/ NZS IEC 60079.32.2:2022; and
 - Painting and marking of piping for identification of its contents as per AS1345:1995.
- Should any portion of the piping system be directly laid in the earth, it should be located at least 300mm below ground level, suitably protected if the area is subject to vehicular traffic and protected from corrosion.
- Secondary containment for diesel piping shall be double-walled piping with interstitial space.
- Vent piping between the tank vent connection and the discharge point, will fall consistently back to the tank at a slope of at least 1:100.
- A vent pipe shall not pass through building foundations but may be embedded in concrete that is part of other building construction.
- Joints in vents shall be of such quality as to prevent vapour leaking, and located so that any leaking that might occur, is prevented from accumulating inside or transferring into enclosed spaces.

- Where vent piping penetrates a fire-rated wall, it will be installed to maintain the fire resistance of the wall.

6.2 Tanker Unloading Area

The tanker offloading area is to be designed to AS1940:2017. The key requirements are as follows:

- The fill point shall be readily accessible and protected from accidental damage and shall be clearly identified and shall comply with AS4977:2008.
- The diesel fuel fill points shall be fitted with a 15-litre capacity device, to catch and contain any minor spill during diesel unloading process.
- Non-return valve will be located at each tank fill line, close to the filling connection or an anti-siphon opening will be made in the filling line, above the tank's maximum liquid level.
- Ensure the length of the fuel transfer hose shall be kept to a minimum ($\leq 6\text{m}$ is best practice).
- It is recommended to undertake a fuel tanker swept path analysis to ensure there is enough space for the fuel tanker to drive through the site, without needing to reverse.
- The location of the bulk fuel tank fill points should be such that the road tanker can stand wholly off any public road and be able to drive forward.
- Sufficient lighting shall be provided for the road tanker unloading area to provide safe working conditions and clear visibility of all signs, level instrumentation and alarms.
- Ensure the tank level indicator is visible to the fuel tanker driver.

6.3 Pumping Equipment

Fuel pumping equipment shall comply with AS1940:2017 Clause 6.4. Key requirements are as follows:

- Where the downstream of the pump can be shutoff, provision shall be made to prevent or relieve potential excess pressure or thermal effects. This could be achieved via provision of a hydraulic relief valve; and
- An emergency shut-off device shall be provided on each pump. This device shall be readily accessible and clearly labelled.

6.4 Spillage Containment

Provision shall be made to contain any leak or spillage and prevent contamination of the surrounding area and/or stormwater system. Therefore, the following recommendations will be considered:

- A spill response kit will be supplied to the store area to contain the spread of any leak or spill from fittings.
- To reduce the risk of stormwater contamination, the drainage system within the bulk fuel area should be covered during fuel tanker unloading.
- The diesel fuel fill points shall be fitted with a 15-litre capacity device, to catch and contain any minor spill during diesel unloading process.

6.5 Separation Distances

6.5.1 Bulk fuel tanks

Based on AS1940:2017, the minimum separation distances applicable to 120,000 L, double-walled, outdoor, aboveground diesel storage tanks are as follows:

Table 5. Buk Fuel Tank Separation Distance as per AS1940:2017

Separation required from aboveground tank to:	Minimum distance required
On-site protected places (such as offices, other DG stores)	7.5 m
Security fence	7.5 m
Off-site protected place	7.5 m
From another horizontal tank	600 mm

Notes:

1. The tanks should not be arranged end-to-end.
2. Combustible vegetation should be maintained at least 3m away from any tank enclosure.

The distances can be seen in Figure 3 and the minimum separation distance requirement is satisfied. Based on the AS 1940 definition, the existing Plant Room G is not considered as on-site protected place since it is not a building where people are normally employed based on the AS 1940 definition.

6.5.2 Day tanks

In accordance with AS 1940:2017, the minimum separation distances applicable to 1,000 L, double walled, storage tank, located indoors are listed below:

Table 6. Day Tank Separation Distance (indoor) as per AS1940

Separation required from day tank to:	Minimum distance required (m)
Other tanks	3
On-site protected places (such as offices, other DG stores)	Unrestricted
Security fence	3
Off-site protected place	Unrestricted

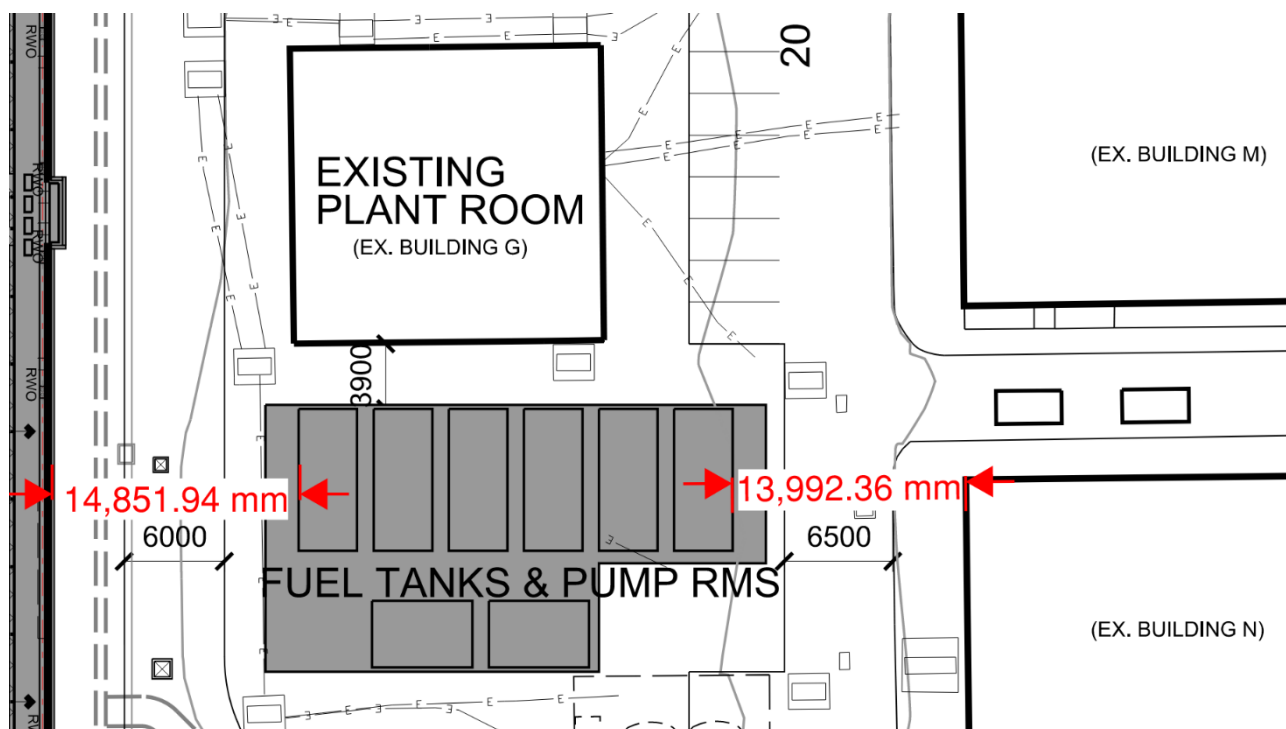


Figure 3 SYD02 Bulk Fuel Tank Separation Distances

6.6 Fire Protection

As a minimum, the fire protection system will meet the requirements of AS1940:2017 Section 11. The following fire protection equipment will be provided for the diesel and batteries systems:

6.6.1 Bulk fuel tanks

At the storage tank area considering that the bulk tanks have an aggregate capacity of 720,000L, the requirements of AS1940:2017 Clause 11.12 shall apply wherein a hose reel and foam-making equipment shall be provided. The fire hose reels shall comply with AS/NZS 1221:1997 and AS 2441:2005. The foam-making equipment shall be capable of producing at least 27 L/min of foam solution at a minimum of 220 kPa for 30 minutes. Moreover, two (2) powder-type extinguishers and additional sets of fire extinguishers shall be provided for multiple tank installation as required. The fire extinguishers must be located within 15m from the storage tank area.

At the tank vehicle delivery location (i.e. fill point area), at least one powder-type portable extinguisher shall be provided within 10 m of a hose connection point or a manifold with a minimum of two powder-type extinguishers for the installation.

Moreover, at the pump room, at least one powder-type extinguisher is provided between 3m and 10m from the pumps.

6.6.2 Day tanks

Diesel storage day tanks with an aggregate capacity of 46,000L are located indoors within the SYD02 data centre. Based on the requirement that a minimum of 3 metres will separate these day tanks from each other, the following fire protection requirements apply:

- One powder type extinguisher located within 10 meters of the tank.
- 10 L/s fire hydrant system, compliant with AS2419.1 for the building.

Additional Notes:

1. Where the term 'powder-type extinguisher' is used it shall mean a portable powder-type fire extinguisher having a rating of at least 2A 60B(E) and 9 kg capacity. Where the term 'foam extinguisher' is used it shall mean a portable foam fire extinguisher having a rating of at least 2A 20B.
2. The fire detection, warning and alarm system within the facility shall comply with AS1940:2017, AS1670 and AS1603.5:1996. Its power supply shall be independent of the main electricity isolating switch for the area and shall be connected to a fire station nominated by Fire and Rescue NSW. Manual alarm call points shall be located at convenient and safe locations around the facility.
3. The UPS battery room fire suppression system is to be designed and installed as per FM Global Data Sheet 5-33 and NFPA 855.
4. Any fire water or fire debris contaminated with chemicals is classified as Controlled Waste. A release of such content to the outside boundary of this site or to groundwater is considered a violation to the Environment.

6.7 Emergency Response Plan

The Regulations require DCI to prepare and implement a written emergency plan for dealing with any dangerous event associated with the storage and handling of dangerous goods at the site. DCI should ensure that the site emergency response plan/procedure meets the following requirements:

- Information on the size and complexity of the installation, its resources, and personnel.
- Consider any potential for the occurrence of fire, explosion, natural disaster, reaction, or release of dangerous goods.
- The operator of the site must ensure there is an emergency plan for the site and a copy of current plan is kept on the site; and
- Regularly reviewed and updated, as necessary.

Lithium-ion batteries room to be considered in the emergency management plan with respect to fire hazards.

6.8 Placards

Any dangerous goods storage and handling site with more than a placard quantity of dangerous goods must:

- Ensure that an 'HAZCHEM' is displayed at every main entrance to the site. The placard must display the word 'HAZCHEM' in red letters on a white or silver background.
- Be visible from the normal direction of approach to site.
- Be regularly reviewed and updated, as necessary.

Table 7. Placarding requirements as per AS1940:2017

Location	Placarding Required
At the entrance(s) to the Data Centre facility	■ HAZCHEM sign, black letters on a white background, at least 120mm high and 100mm lettering size; ■ A WARNING—RESTRICTED AREA, AUTHORIZED PERSONNEL ONLY sign; ■ A sign listing the emergency contact names, titles and phone numbers relevant to the installation; ■ The name, address, and phone number of the occupier; and ■ A layout diagram showing the location of fire protection facilities, the drainage system and the 'Emergency Stop' switches.
At the entrance(s) to DG storage areas (Diesel tank/ pump rooms and Generator Rooms)	■ A DANGER—NO SMOKING, NO NAKED FLAMES sign; ■ A WARNING—RESTRICTED AREA, AUTHORIZED PERSONNEL ONLY sign. ■ For combustible liquids, a COMBUSTIBLE LIQUID sign at least 100mm lettering size.
Tanker Offloading/ Delivery Area	■ A prominent sign on or near the dispenser shall be marked in letters at least 50 mm high as STOP ENGINE—NO SMOKING.

Location	Placarding Required
	Each fill point for storage tank shall be clearly identified.
Storage Tank markings	- Tank identification numbers/ letter; - Tank contents, e.g., 'COMBUSTIBLE LIQUID'. - Tank Capacity. - Markings shall be displayed on the outside walls of the tanks and shall be not less than 500mm in height for tanks having a diameter of 6 metres or greater. For tanks of less than 6 metre diameter the markings shall be not less than 150mm in height. - All markings shall be of a colour contrasting with that of the tank; - A sign bearing the words 'NO SMOKING, NO IGNITION SOURCES; and - The markings shall be clearly visible from main alternative access points likely to be used by the fire authority.
Aboveground pipework	All above-ground pipes shall be colour-coded or labelled.

All placards must be clean, in good order and unobstructed. These must be located so that they are clearly legible to persons approaching and shall be separated from any other sign or writing that contradicts, qualifies, or distracts attention from the placard.

Where two or more points of access are adjacent to each other so that a single set of signs and notices are clearly readable from each point of access, duplicate signs and notices are not required. Signs shall comply with AS 1319. Class labels shall conform to AS 1216 and be a minimum of 250mm square. Other signs shall have lettered at least 50mm high.

6.9 Safety Information

Safety information, intended principally for emergency services, shall be provided at a suitable location near the entrance to the facility and include:

- The location of the emergency plan.
- The location of the manifest.
- The location of PPE and clean-up equipment.
- The location of utilities and their isolation points.

Such information shall be available at the site main entrance, or at one entrance, if there is more than one access point.

6.10 Lithium-Ion Battery Room Assessment (In-Use)

The following safety considerations apply to the proposed UPS and Mech battery enclosures in the SYD02 Data Centre:

6.10.1 Construction

The wall and floor should be one hour fire rated and the door should be an electromechanical or electromagnetic holding mechanism interlocked to close the door on smoke detector actuation.

6.10.2 Human element

An emergency response plan shall be developed. Refer to Section 6.7.

6.10.3 General safety considerations

- Wiring and its installation will be sufficient to withstand the maximum anticipated voltage, current, temperature, altitude, and humidity requirements.

- The casing of a cell, module, battery pack and battery system will incorporate a pressure relief function that will preclude rupture or explosion.
- The design of the battery system will be such that abnormal temperature-rise conditions are prevented.
- Terminals will have clear polarity markings on the battery packs or the system's external surface.
- The cell manufacturer will provide information about the product's current, voltage and temperature limit.
- The battery system will be provided with a voltage control function to ensure the voltage of each cell does not exceed the upper limit charging voltage specified by the manufacturer.

6.11 Lithium-Ion Battery Room Assessment (Not In-Use)

The following requirements apply to the additional lithium-ion battery storage for secondary systems within the SYD02 Data Centre, as detailed in Table 3. The batteries are not in-use and as such are considered dangerous goods. The following requirements apply as well as those listed in Section 6.10.

6.11.1 AS/NZS 4681:2000

During the transport and storage of lithium-ion batteries (new or used), the cells are regarded as Class 9 dangerous goods, and risks may be managed by implementing the relevant clause in AS/NZS 4681. The proposed battery storages in the SYD02 Data Centre are classified as Class 9 dangerous goods (UN3480).

Therefore, the following minimum requirements are applicable:

- The battery storage rooms are considered 'rooms within a building' as per the store definition in AS/NZS 4681.
- Stores for storage of lithium batteries shall be separated from protected places and boundaries by at least 3m as per the standard.
 - Separation distances may be achieved by the use of screen walls.
 - Such a screen wall shall have an FRL of at least 60/60/60. However, from previous experience FRNSW generally requests a 2 hour minimum rating.
- The maximum storage height of the batteries shall be marked within each room. This is nominally below the sprinkler system and shall be based on any fire protection advice for effective fire protection performance.
- The store construction shall be non-combustible.
- Sufficient lighting shall be provided during the hours of operation, that includes safe working conditions, and clear visibility of all signs, labels, instruments and other necessary items.
- Adequate natural or mechanical ventilation shall be provided.
- Where mechanical ventilation is provided, it shall comply with AS 1668.2.
- All access ways shall be maintained in a safe condition. Where racking is installed, their layout shall allow for clear passage of personnel.
- Storage areas shall be secure against unauthorised entry.
- The appropriate dangerous goods class labels, with sides of at least 250 mm.
- A warning sign to restrict unauthorized entry.
- Where applicable, a warning sign to prohibit smoking and other ignition sources, e.g. 'DANGER: NO SMOKING, NO IGNITION SOURCES'.
- Where applicable, warning signs indicating the presence of elevated temperature liquids.

- Fire protection requirements shall be based on consultation with authorities and the standard (AS/NZS 4681).
 - AS/NZS 4681 requires as a minimum, fire protection as per BCA requirements and portable fire extinguishers.
- Fire sprinkler systems shall be installed in accordance with AS 2118 and maintained in accordance with AS 1851.3.
- Stores of dangerous goods shall be adequately protected from adjacent potential fire exposures by the use of fire-rated radiation barriers. Based on previous consultation with FRNSW, each room should be separated with a minimum of 2hr fire rated walls.

6.12 Substation

An additional substation containing 3 grid transformers has been proposed to be built in the south-east corner of the facility. The substation design and compliance shall be met by the electrical designer however for dangerous goods compliance, the grid transformers shall meet the following requirements in order to be compliant:

- Spill containment shall be in the form of a tank, pond or other storage and shall have a net capacity of at least the largest single unit draining into it, and be equipped with underflow discharge.
- Where a compound is provided with continuous drainage, draining shall be via a flame trap or traps to an oil spill containment facility.
- Electrical equipment filled with combustible oil shall comply with clause 5.8 of AS 1940 and meet the following:
 - The compound shall be sufficiently impervious to retain spillage and to enable recovery of any such spillage.
 - In a fire situation, the bund shall retain the structural integrity, which includes any bund wall joints and penetrations.
 - Any bund or compound floor shall be designed to withstand the hydrostatic head when full.
 - Any earthen wall 1 m or more in height shall have a flat section at the top at least 600 mm wide.
 - The slope of any earthen wall shall be consistent with the angle of repose of the material from which the wall is constructed.
 - A bund shall not be higher than 1.5 m above interior grade unless means for safe and rapid entry and exit are provided.
 - Any pipe that passes through a bund shall be designed to prevent excessive stresses as a result of settlement or expansion resulting from fire exposure. The joint between the pipe and the bund shall be sealed to prevent leakage.
 - The drainage provision shall slope away from any tank to a sump which is in turn drained from the lowest level either by gravity or by pumping.
 - The drain from one compound discharge shall not drain into another.
 - Any valve controlling the drainage from a compound shall be located outside the bund except for the valves for intermediate sub-compounds. The valve shall be of a type in which the distinction between the open and shut positions is obvious, and shall incorporate a provision to be locked shut when not actually draining.
 - The discharge from any sump which could contain flammable or combustible liquid shall be through an interceptor appropriate to the product, readily accessible for inspection, located outside the

compound, and designed to prevent the discharge of flammable or combustible liquids to any natural watercourse, public sewer, or drain.

Notes:

1. This section relates specifically to storage and handling and generally does not apply to electrical equipment which in normal operation uses combustible mineral oil as an insulating and cooling medium. However, the requirements of this section regarding containment of liquid spills apply in principle, since large volumes of oil can be involved.
2. This section does not apply to instrument transformers, circuit breakers, and similar items in outdoor switchyards.

6.13 Additional Recommendations

6.13.1 Bulk fuel tanks

In general, the following requirements will be implemented at the diesel tank storage area:

- The firewall's height will be a minimum of 0.5 metres above the storage tank release point (vent).
- Any windows or doors within 7.5 metres in a horizontal and vertical plane will have fire resistance.
- Ensure the fuel storage tank vent is located 2 metres from any on-site protected place opening.
- To ensure independent operation and maintenance of each tank, isolation valves shall be provided between the bulk fuel tanks.
- Ensure piping is adequately protected from inadvertent penetration and impact. Any grates for pipe trenches shall be design sufficiently to withstand regular vehicular traffic expected on site.

6.13.2 Day tanks

For safety requirements, smoke detectors and fire alarms should be installed at each generator. Each generator should be interlocked with an automatic shutoff with any smoke alarm.

Audible alarms should also be located adjacent to tanks so that personnel can become aware and escape any hazardous scenario. Leak detection shall be implemented into tank controls to allow for quicker response and control of spillage.

Piping to and from the tanks must be separated from electrical cables to be compliant.

The proposed day tanks are "double-walled tanks" designed and manufactured to AS 1940 and AS 1692 and should comply with the following requirements:

- Enclosure doors should be either sliding or outward opening, to help persons inside the room to escape.
- Special consideration should be given to the fuel return line, as the diesel fuel may be heated by the generator and create a hazardous area.
- All piping connections to the tank shall be above the normal maximum fill level.
- Overfill protection should be provided with an alarm for high level and high-high level.
- Provide adequate clearance between the tank and any structure (a minimum of 600mm clearance is recommended around each day tank).
- Installed with fittings listed in Table 8.

Table 8. Day Tank Fittings

Nozzle	Service
N1	Interstitial space vent
N2	Tank vent
N3	Gauge
N4	Level indicator
N5	Fill point (inlet point)
N7 and N8	Spares nozzle
N9	Fuel suction (outlet point)
N10	Fuel return line

- Vents N1 and N2 shall discharge outside the enclosure, 4 metres aboveground level and 2 metres from any opening to the building.
- The enclosure and its support shall be designed to eliminate enclosure failure during a fire event.
- The fill point shall be readily accessible and protected from accidental damage.
- The generator enclosure to be bonded and earthed to avoid any risk associated with static electricity that could be generated during diesel fuel unloading.
- The generator enclosures shall be protected against damage from impact with vehicles and mobile equipment.

6.13.3 Lithium-ion Batteries

Lithium batteries located in the UPS and Mech battery rooms are considered “in use” batteries meaning a SafeWork notification is not required. Recommended controls for Lithium Battery rooms are:

- Adequate ventilation
- Signage to indicate battery storage
- Firewater not to be discharged to sewer from battery room.
- Impermeable floor and wall surfaces
- Weatherproof coverings
- An easily accessible emergency spill kit
- Routine inspection and housekeeping procedures
- Smoke and heat detection and non-water-based response equipment
- Unobstructed access to serviceable dry powder fire extinguishers
- Clear paths of travel with unobstructed exits for personnel

For disposal of waste batteries, the following measures should be taken to reduce any hazards:

- Protect battery terminals or loose wires using non-conductive tape
- Collection units and aggregated waste stacked to prevent risk of falling objects
- Use containers with adequate ventilation (e.g., venting cap):
 - Use plastic or cardboard UN approved containers for battery storage at your facility.

- Avoid storing batteries in metal containers as this could lead to a fire risk. If using metal storage; line with electrically non-conductive lining material (e.g., plastic bag)
- Provide non-conductive and non-combustible cushioning material to fill empty space between batteries.

Additional minor lithium-ion battery storage has been noted on site however exact locations and sizes are unknown. Section 6.11 shall be followed at a minimum for compliance and this report should be reviewed and updated once battery sizes and locations are known.

7 Conclusion

This report documents the recommended controls for the storage of diesel fuel (combustible C1) and UPS lithium batteries associated with the SYD02 Data Centre in accordance with the regulations and to operate with acceptable risk to people, property, and the environment.

The dangerous goods stored at SYD02 Data Centre can be stored safely provided that all the design requirements of dangerous goods listed in this report are met and all outstanding risk control measures are implemented.