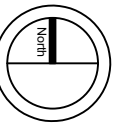


6.0m HEIGHT NOISE WALL

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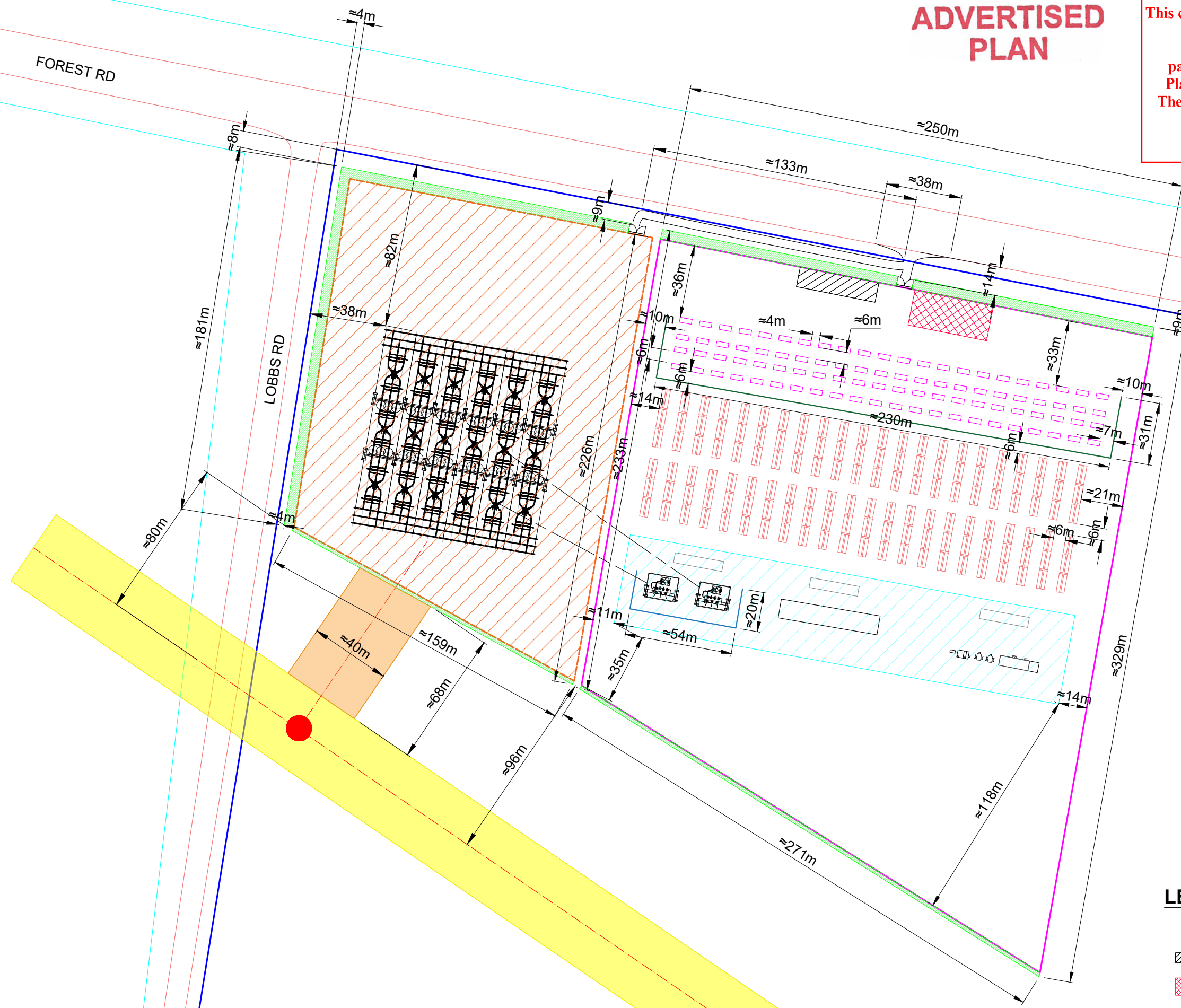
	SITE ACCESS GATE AND ROAD		RESS SECURITY FENCE 1.8 METERS HIGH CHAIN MESH SECURITY FENCE GALVANISED STEEL		OH LINE EASEMENT OH LINE
	SITE CAR PARK ZONE		ROAD / HIGHWAY RAILWAY		LANDSCAPE AREA BATTERY CONTAINER
	SITE CONSTRUCTION OFFLOAD ZONE		TERMINAL NEIGHBOURING'S BOUNDARY 6.0m NOISE WALL		INVERTER AND MV POWER STATION CONTAINER WATER TANK
			6.0m NOISE WALL		8.5m NOISE WALL





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ADVERTISED PLAN



NOTES:

- NOTE 1: DETAIL INFORMATION FOR DSTO SWITCHING STATION AND NEW HV LINE TO BE CONFIRMED IN DETAIL DESIGN STAGE
- NOTE 2: DETAIL INFORMATION FOR CONNECTION ASSET TO BE CONFIRMED IN DETAIL DESIGN STAGE
- NOTE 3: DETAIL INFORMATION FOR BATTERY ELEVATIONS REFER TO "G-3.0_000901"
- NOTE 4: DETAIL INFORMATION FOR MVPS ELEVATIONS REFER TO "G-4.0_000901"
- NOTE 5: DETAIL INFORMATION FOR SECURITY FENCE AND LANDSCAPING REFER TO "G-5.0_000901"
- NOTE 6: DETAIL INFORMATION FOR SWITCHING STATION ELEVATIONS REFER TO "G-6.0_000901"
- NOTE 7: DETAIL INFORMATION FOR NOISE WALL REFER TO "G-7.0_000901"
- NOTE 8: DETAIL INFORMATION FOR HV LINES FROM BESS TO SWITCHING STATION TO BE CONFIRMED IN DETAIL DESIGN STAGE
- NOTE 9: DIMENSIONS FOR SITE ENTRANCE CROSS OVER IS FOR INFORMATION ONLY. DETAILS TO BE PROVIDED UNDER THE DETAIL DESIGN
- NOTE 10: DIMENSIONS FOR THE SWITCHING STATION IS FOR INFORMATION ONLY. DETAILS TO BE PROVIDED UNDER THE DETAIL DESIGN.

LEGEND

- SITE ACCESS GATE AND ROAD
- SITE CAR PARK ZONE
- SITE CONSTRUCTION OFFLOAD ZONE
- BESS SECURITY FENCE 1.8 METER HIGH CHAIN MESH SECURITY FENCE GALVANISED STEEL
- ROAD / HIGHWAY / RAILWAY
- TITLE BOUNDARY
- NEIGHBOURING BOUNDARY
- 6.0m NOISE WALL
- OH LINE EASEMENT
- OH LINE
- LANDSCAPE AREA
- BATTERY CONTAINER
- INVERTER AND MV POWER STATION
- CONTAINER
- WATER TANK
- 8.5m NOISE WALL

REVISIONS					
REV	STATUS	DESCRIPTION	DATE	D.B.	C.B.
A	FA	INITIAL ISSUE	15/08/22	XT	RZ
B	FA	SITE PLAN UPDATED	05/03/23	XT	RZ
C	FA	UPDATED ACCORDING TO CUSTOMER COMMENTS	20/04/23	VS	RZ
D	FA	DETAILS UPDATED	27/06/23	XT	RZ

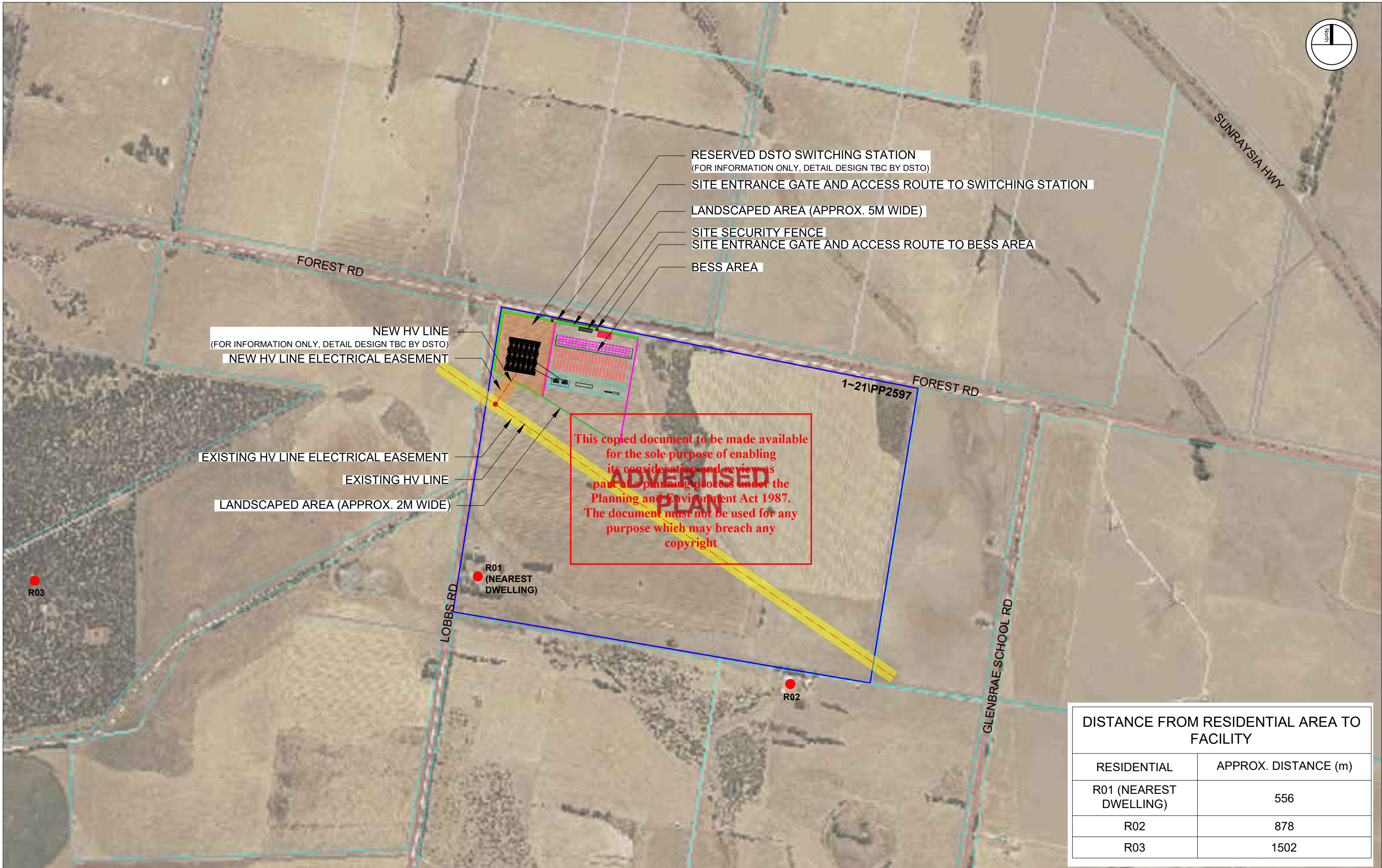
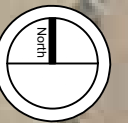
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CLIENT DETAILS:	ACENERGY PTY LTD
DRAWING TITLE:	SITE PLAN 2 OF 2

SCALE: 1:2000

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DRAWN BY :	XT	APPROVED BY : RZ
PROJECT MGR :	LZ	
SCALE :	AS INDICATED	ISSUE : FOR APPROVAL
ISSUE DATE :	27/06/2023	
SHEET SIZE:	A3	PROJECT NO: 901
REV. NO:	D	





DISTANCE FROM RESIDENTIAL AREA TO FACILITY

RESIDENTIAL	APPROX. DISTANCE (m)
R01 (NEAREST DWELLING)	556
R02	878
R03	1502

REVISIONS					
REV	STATUS	DESCRIPTION	DATE	D.B.	C.B.
A	FA	INITIAL ISSUE	15/08/22	XT	RZ
B	FA	LANDSCAPE UPDATED	05/03/23	XT	RZ
C	FA	PROJECT DETAIL ELEMENT INCLUDED	27/06/23	XT	RZ

PROJECT DETAILS:	GLENBRAE BESS 438 Lobbs Rd Glenbrae -37.328781, 143.554825
CLIENT DETAILS:	ACENERGY PTY LTD
DRAWING TITLE:	LOCALITY DIAGRAM 1 OF 2


SCALE: 1:10000

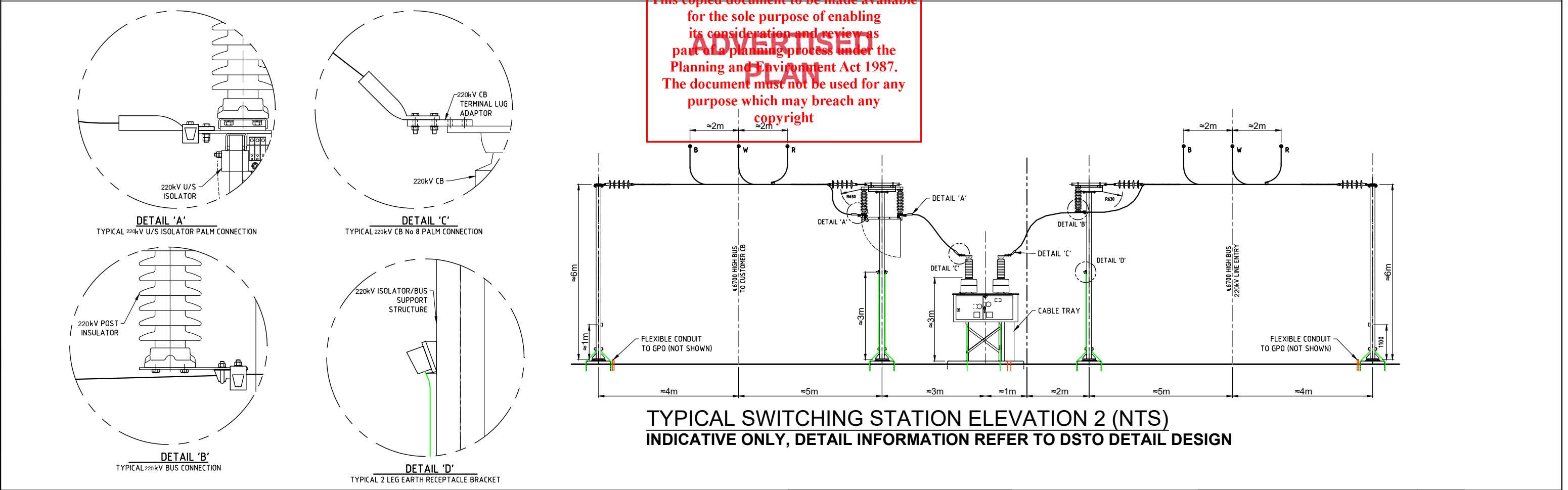
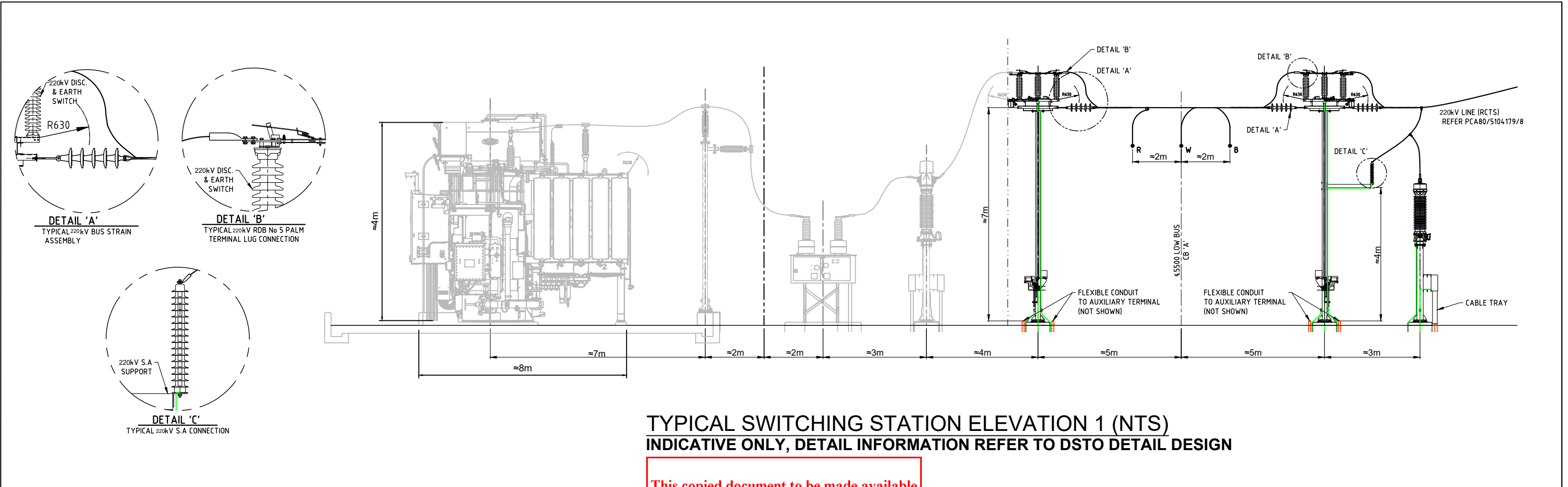
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DRAWING NR: G-2.1_000901		
DRAWN BY : VS	APPROVED BY : RZ	PROJECT MGR : LZ
SCALE : AS INDICATED	ISSUE : FOR APPROVAL	ISSUE DATE : 27/06/2023
SHEET SIZE: A3	PROJECT NO: 901	REV. NO: C





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REVISIONS						PROJECT DETAILS:		DRAWING NR: G-6.1_000901	
REV	STATUS	DESCRIPTION	DATE	D.B.	C.B.	CLIENT DETAILS:			
A	FA	INITIAL ISSUE	15/08/22	XT	RZ	ACENERGY PTY LTD			
B	FA	DETAIL INFORMATION ADDED	27/06/23	XT	RZ				
DRAWING TITLE:						SWITCHING STATION ELEVATIONS		COPYRIGHT OF THIS DRAWING RESERVED BY ACENERGY PTY LTD. NO PART OF THIS DOCUMENT MAY BE REPRODUCED OR COPIED IN ANY FORM OR BY ANY MEANS WITHOUT CONSENT OF ACENERGY.	
								DRAWN BY : XT	
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								PROJECT MGR : LZ	
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								ISSUE : FOR APPROVAL	
								ISSUE DATE : 27/06/2023	
								SHEET SIZE: A3	
								PROJECT NO: 901	
								REV. NO: B	

ST2752UX

Liquid Cooling Energy Storage System

Preliminary



ADVERTISED PLAN



LOW COSTS

- Highly integrated ESS for easy transportation and O&M
- All pre-assembled, no battery module handling on site
- 8 hour installation to commission, drop on a pad and make electrical connections



SAFE AND RELIABLE

- Integrated DC/DC converters actively limit fault current
- DC electric circuit safety management includes fast breaking and anti-arc protection
- Multi level battery protection layers formed by discreet standalone systems offer impeccable safety



EFFICIENT AND FLEXIBLE

- Intelligent liquid cooling ensures higher efficiency and longer battery cycle life
- Modular design supports parallel connection and easy system expansion
- IP54 outdoor cabinet and optional C5 anti-corrosion



SMART AND ROBUST

- Fast state monitoring and faults record enables pre-alarm and faults location
- Integrated battery performance monitoring and logging

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Type designation	ST2752UX
Battery Data	
Cell type	LFP
Battery capacity (BOL)	2752 kWh
System output voltage range	1160 ~ 1500 V
General Data	
Dimensions of battery unit (W * H * D)	9340*2600*1730mm
Weight of battery unit	26,400kg
Degree of protection	IP54
Operating temperature range	-30 to 50 °C (> 45 °C derating)
Relative humidity	0 – 95 % (non-condensing)
Max. working altitude	3000 m
Cooling concept of battery chamber	Liquid cooling
Fire safety	Fused sprinkler heads, NFPA 69 explosion prevention and ventilation IDLH gases
Communication interfaces	RS485, Ethernet
Communication protocols	Modbus RTU, Modbus TCP
Compliance	CE, IEC 62477-1, IEC 61000-6-2, IEC 61000-6-4, IEC 62619

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1 Configuration of Sungrow ST2752UX Liquid Cooling BESS Container

Refer to the top view and front view below to better understand the configuration of a ST2752UX battery container.

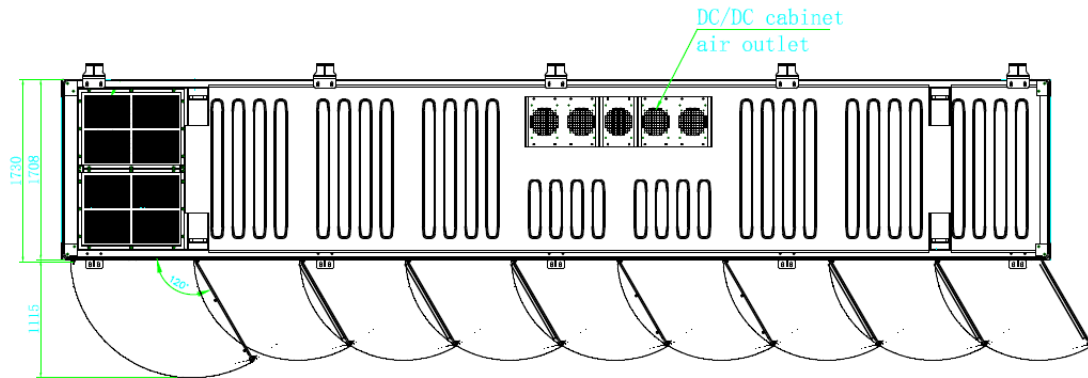


Figure 1 Top view of Sungrow ST2752UX battery container

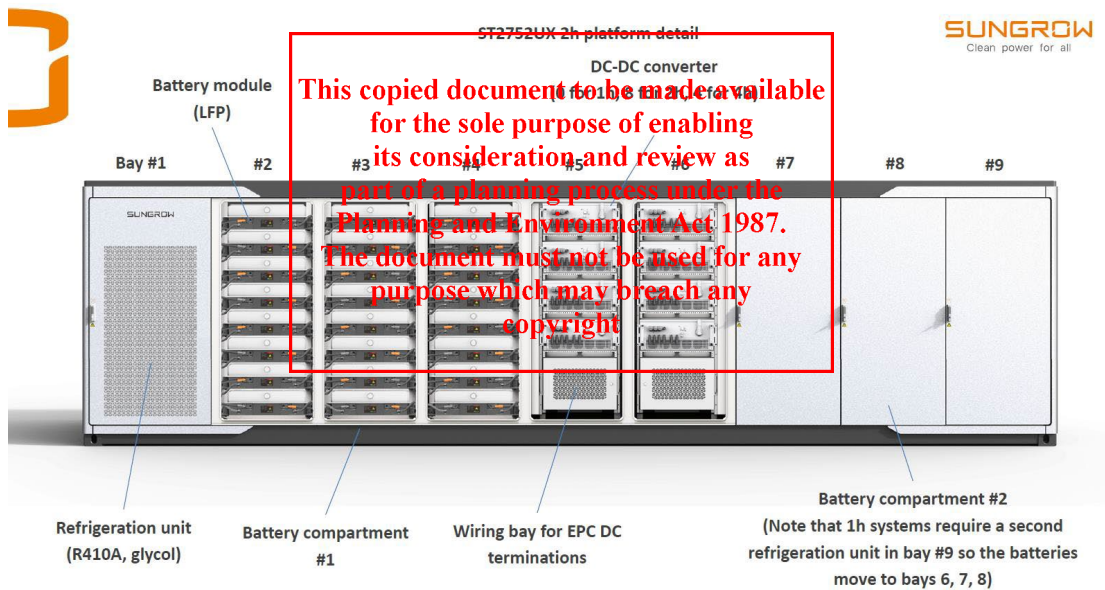


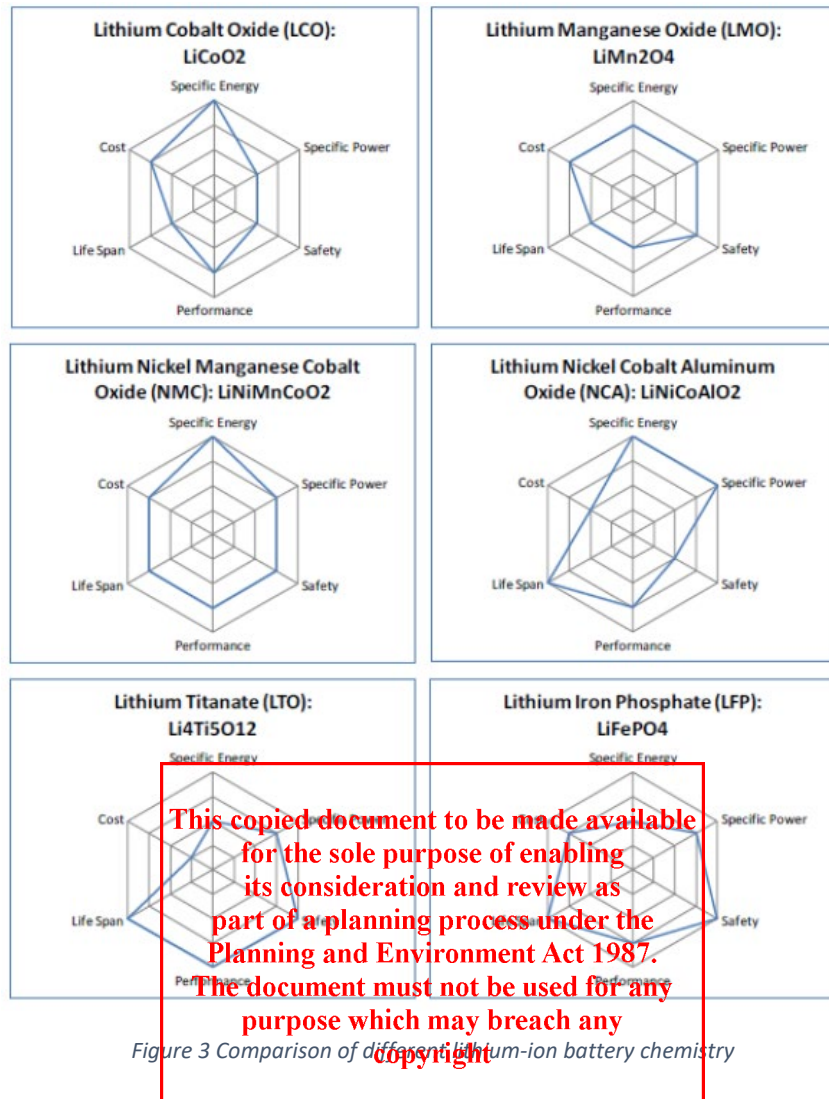
Figure 2 Front view of Sungrow ST2752UX battery container

2 LFP Chemistry

2.1 Characteristics of LFP Batteries

The battery chemistry chosen for the proposed development is lithium-Ion phosphate (LifePo4, or simply LFP) within the greater lithium-ion chemistry group. It is by far the safest commercially available battery (see Figure 3 below).

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2.2 Low Chance of Fire Ignition

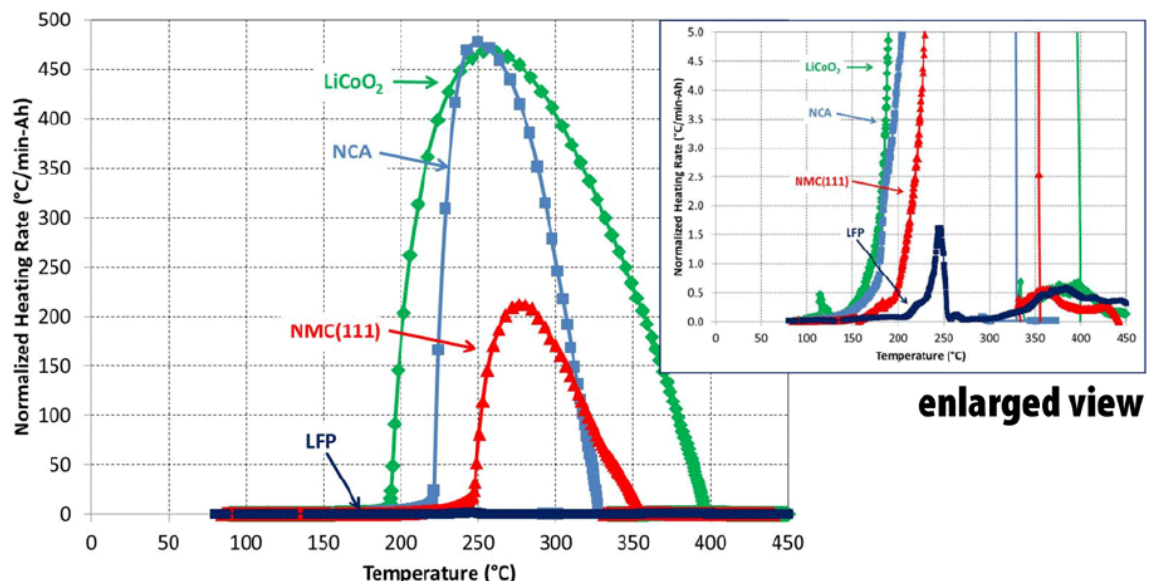
The chance of LFP batteries catching fire is extremely low. The main reasons are given below.

On the one hand, LFP batteries are insensitive to the thermal runaway phenomenon. Thermal runaway is a heating reaction of batteries under adverse external conditions, which leads to decomposition of the battery cell and eventually inflammation or explosion. LFP batteries are not prone to this effect as their cathode does not contain metal oxides. Various experiments have proven this advantage of LFP batteries. One undertaken by the Sandia National Laboratory demonstrates the internal temperature of a LFP battery cell hardly experiences any abrupt increase, compared to other lithium-ion chemistries, when overheated externally (see Figure 4 below). Therefore, there is limited chance of LFP batteries catching fire when overheating.

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Thermal Runaway: Impact of Cell Chemistry

Accelerating rate calorimetry (ARC) of 18650 cells with different cathode materials



- All measurements at 100% SOC and for cells with 1.2 M LiPF₆ in EC:EMC (3:7)
- Differences in runaway profiles are related to oxygen release and combustion at different cathodes

Figure 4 The impact of lithium-ion cell chemistry on thermal runaway

On the other hand, LFP batteries are resilient to abuse. Numerous impact tests have been done on LFP batteries. The most popular one is the nail penetration test. Please watch the nail penetration tests conducted by different parties on LFP and NMC batteries, both within the lithium-ion group (links provided below). Both videos show that the LFP battery does not catch fire or explode after being punched through, unlike its NMC counterpart.

Video links:

<https://www.youtube.com/watch?v=CSGESKhtZD0&feature=share>

https://www.youtube.com/watch?v=Bg_480HUheo

2.3 Low Chance of Spread of Fire

The LFP chemistry determines that even if a battery cell malfunctions and catches fire, it will release carbon dioxide, which helps suppress fire within the container. The fact of battery cells being containerised provides a suitable condition for natural fire suppression given limited supply of oxygen. Furthermore, each battery container will be built with automatic fire detection and fire suppression system. The design of the battery compartments is also effective in preventing fire spreading inside a container (see Figure 5 below and the BESS container configuration provided in Figure 1 and Figure 2).

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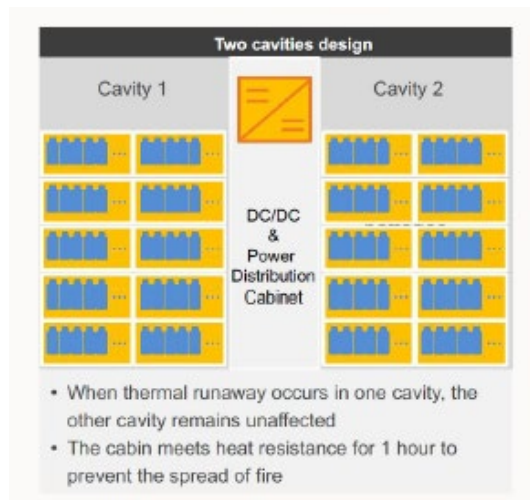


Figure 5 Two-cavity design inside battery containers to prevent the spread of fire

While the risk of fire escalating inside a container is minimum, the chance of fire spreading between containers is even lower. The battery cells are stored on racks inside a container. Racks are made of non-combustible materials, and the two cavities design (see Figure 5) greatly reduces the risk of fire spreading from one cavity to another. The battery cells are fully enclosed in housing made of non-combustible materials, so fire can hardly come out. Furthermore, each battery container is built with automatic fire detection and fire suppression system.

Each battery container has a liquid cooling system to prevent overheating. The containers also have multiple built-in fire protection devices that work collaboratively, including flammable gas, smoke and thermal sensors, pressure relief system and aerosol fire extinguishing system. Therefore, a container will automatically suppress an internal fire in the first instance. The diagram below provided by Sungrow shows a typical arrangement for fire safety devices within a BESS container.

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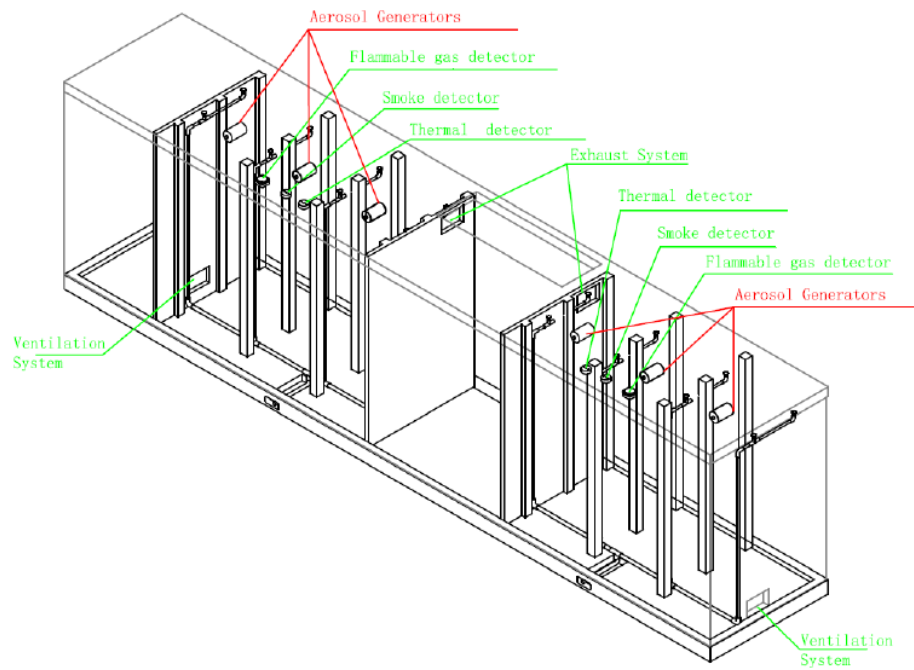


Figure 6 Layout of aerosol fire suppression system

In conclusion, the chosen LFP batteries for the proposed development have negligible risks of inflammation and fire spreading from one battery container to another.

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