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Fire Management Plan

for the

Grahamvale Battery Energy Storage System
at 221 Grahamvale Road and 305 Verney Road
Grahamvale VIC 3651

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Prepared for
AE BESS 3 Pty Ltd

June 2026

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Cover photo – Aerial image of the site and surrounds.

Terramatrix Pty. Ltd.

ACN: 129 163 373 ABN: 44 129 163 373

PO Box 1391, Collingwood VIC 3066

P: 03 9417 2626

www.terramatrix.com.au

Accountability

Role	Name	Position
Project manager	Angus Barbary	Senior Analyst
Analysis and report compilation	John Eastwood	Senior Analyst
Peer review	Jon Boura	Managing Director

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Glossary

AS 3959:2018	AS 3959:2018 <i>Construction of buildings in Bushfire Prone Areas.</i>
AFDRS	Australian Fire Danger Rating System
BAL	Bushfire Attack Level
BESS	Battery Energy Storage System
BMO	Bushfire Management Overlay
BPA	Bushfire Prone Area
CFA	Country Fire Authority
EIB	Emergency Information Book
EMP	Emergency Management Plan
ERP	Emergency Response Plan
EVC	Ecological Vegetation Class
FMP	Fire Management Plan
FRV	Fire Rescue Victoria
FRA	Fire Risk Assessment
FSS	Fire Safety Study
MW	Megawatt
MWh	Megawatt hour
NCC	National Construction Code
NERAG	National Emergency Risk Assessment Guidelines
RHF	Radiant heat flux
RMP	Risk Management Plan

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1 Introduction

This Fire Management Plan (FMP) has been prepared for AE BESS 3 Pty Ltd to demonstrate how the Battery Energy Storage System (BESS) at 221 Grahamvale Road and 305 Verney Road, Grahamvale VIC 3631, aligns with the Fire Rescue Victoria (FRV) publication *Battery Energy Storage Systems Guideline No. 55* (GL-55) (FRV, 2025).

This FMP uses the Model Requirements and BESS specific Requirements outlined in the *Design Guidelines and Model Requirements: Renewable Energy Facilities v4* (CFA, 2023)¹ ('the CFA Guidelines') as a basis to determine the appropriate mechanisms for ensuring identified risks are adequately mitigated in accordance with the FRV GL-55 requirements. It has the purpose of enabling a consultative process with FRV and showing how risks associated with the operation of the BESS, including the risk of fire, will be managed to support safe operation of the facility.

It sets out the fire prevention, mitigation, response and recovery measures to be implemented for the safe operation of a BESS facility.

Risks associated with the development and operation of the Grahamvale BESS, including the risk of starting a bushfire or of being impacted by an established bushfire, have been identified and assessed in the accompanying Fire Risk Assessment (FRA), which uses the CFA Guidelines Risk Management Plan (RMP) as a methodology. The FRA (RMP) informs the measures (risk treatments) documented in this FMP.

The development site comprises an area ('the site') two parcels between Grahamvale Road (to the east) and Verney Road (to the west) at 221 Grahamvale Road and 305 Verney Road, Grahamvale. The primary function of the Grahamvale BESS is to capture and store energy from the existing electricity grid during off-peak energy use times and feed it back into the grid during times of peak energy use. The anticipated operational lifespan of the facility is approximately 30 to 50 years.

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¹ Version 4 of the Guidelines (2023) has had multiple minor amendments since being published, the most current is version 4.4, which was issued 11-06-2025, however the update has not changed the publishing date in the document.

2 BESS overview

Addresses:	221 Grahamvale Road, Grahamvale VIC 3631 (part of) 305 Verney Road, Grahamvale VIC 3631 (part of)
Lot and Plan Number	Lot 2 PS314077 Lot 2 LP219260
BESS development area:	Approx. 10 ha
BESS footprint:	Approx. 4 ha
Local Government Area:	City of Greater Shepparton
Zone	Farming Zone – Schedule 1 (FZ1)
Overlay	Specific Contributions Overlay – PS map ref. SCO3 Schedule (SCO3)
Directory reference	VicRoads 673 U1
Site assessment date	16/07/2024
Assessed by	Angus Parbury

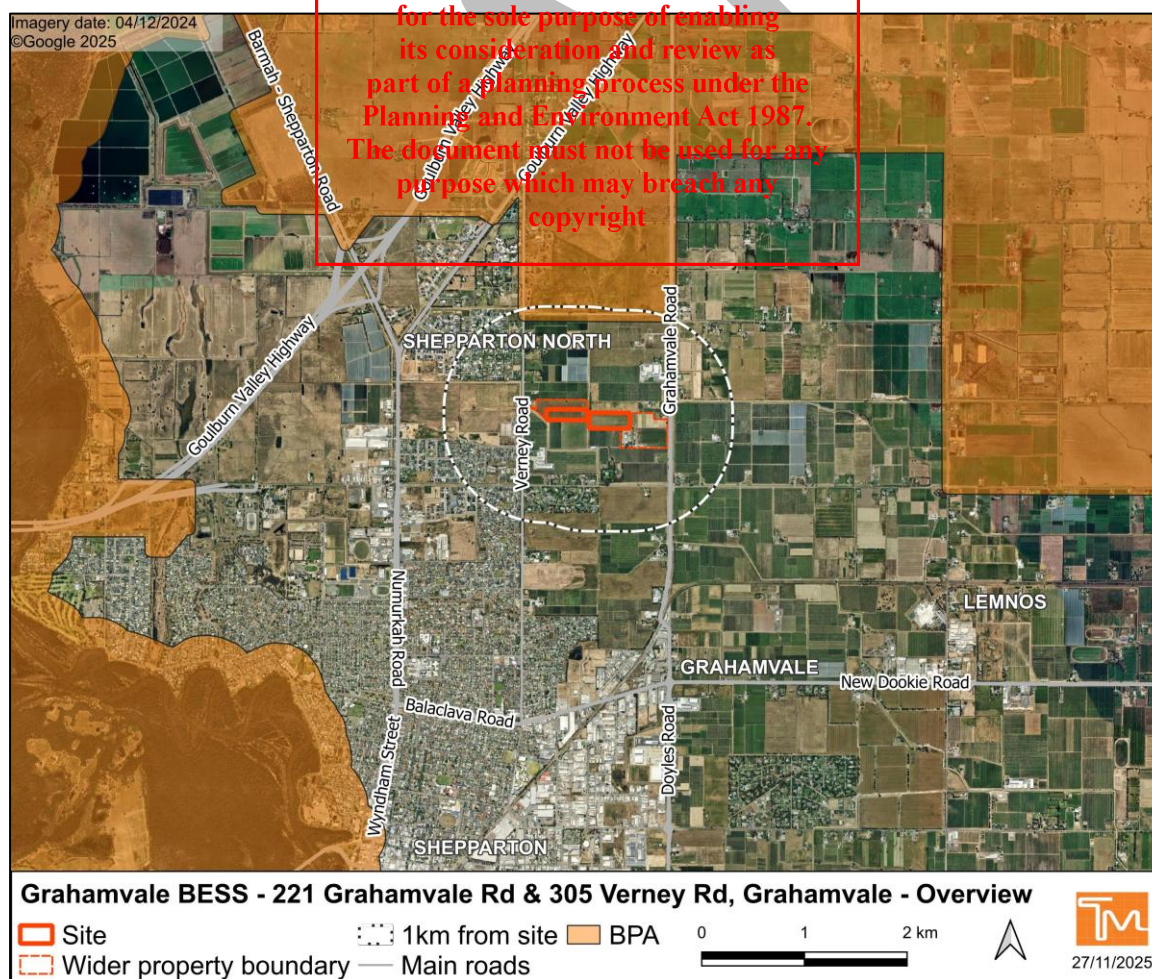


Figure 1– Overview of the Grahamvale BESS location.

The site is in FRV FS75 district and the nearest fire station is located 5 km away in Shepparton. The nearest CFA-operated fire stations are located at Shepparton East 8 km to the south-east, Mooroopna 8 km to the south-west and Tallygaroopna 11 km to the north.

The Grahamvale BESS will include a battery array, a substation that connects the facility to the wider power grid, electrical equipment and supporting infrastructure.

The site will also include temporary laydown and batch plant, storage areas, acoustic walls (concrete) running the full perimeter of the site and also internally (see Map 1), fencing, roads, drainage, spill containment, earthing, and supporting buildings including switchgear, control, operations and maintenance building/s. The BESS development area has access to reticulated water for supply to a hydrant system. Two 144,000 L static water supply tanks are proposed.

At the time of submission of this Draft FMP and the accompanying Draft FRA (RMP), the final arrangement and manufacturer of the battery array has not been confirmed, however, the final decision to be confirmed as soon as possible.

Infrastructure details:

Manufacturer	Model/type	Details	Fire Suppression System
TBC	TBC	Approx. TBC BESS modules. Individual capacity: TBC MW. Aggregate capacity: TBC MW.	To be provided once OEM is determined
Item	Details		
Battery Chemistry	LFP (lithium iron phosphate (LiFePO ₄)).		
Cooling and ventilation	To be provided once OEM is determined TBC		
Water and ember protection	All systems feature an IP55 rating, protecting against water ingress and ember penetration.		
Fire and explosion	To be provided once OEM is determined TBC		

Standards complied with
AS/NZS 5139: General Installation and Safety Requirements for BESS. IEC 61439: Low-voltage switchgear and control gear assemblies. IEC 62619: Safety of Secondary Lithium Batteries. IEC 62933-5-2: Safety Requirements for Grid-Integrated Electrochemical Energy Storage Systems. IEC 62477-1: Safety of Power Electronic Converter Systems. IEC 61000-6-2/4: Electromagnetic Compatibility (EMC). IEEE 693: Seismic Design Level. NFPA 69: Standard on Explosion Prevention. NFPA 855: Standard for the Installation of Stationary Energy Storage Systems. UL 1973: Batteries for Use in Stationary, Vehicle Auxiliary Power, and Light Electric Rail Applications. UL 9540A: Energy Storage Systems and Equipment Testing.

UN 38.3: UN Transportation Testing for Lithium Batteries.

Further details

Item	Details
AC power	480 MW.
Power conversion system (PCS)	Inverter rating: To be provided once OEM is determined TBC Number of PCS modules: 140
Battery cell overall mass	TBC (subject to final design and product chosen).

Fire protection related infrastructure and preparedness

Item	Details
Fire water tanks	Two 144,000 L static water supply tanks are proposed.
Acoustic walls	On all site boundaries and between rows of BESS modules.
Fire break	Minimum 15 m of non-vegetated (gravel/road) separation between infrastructure and site boundary. 7 m wide perimeter road within fire break providing full access to boundary and between rows.

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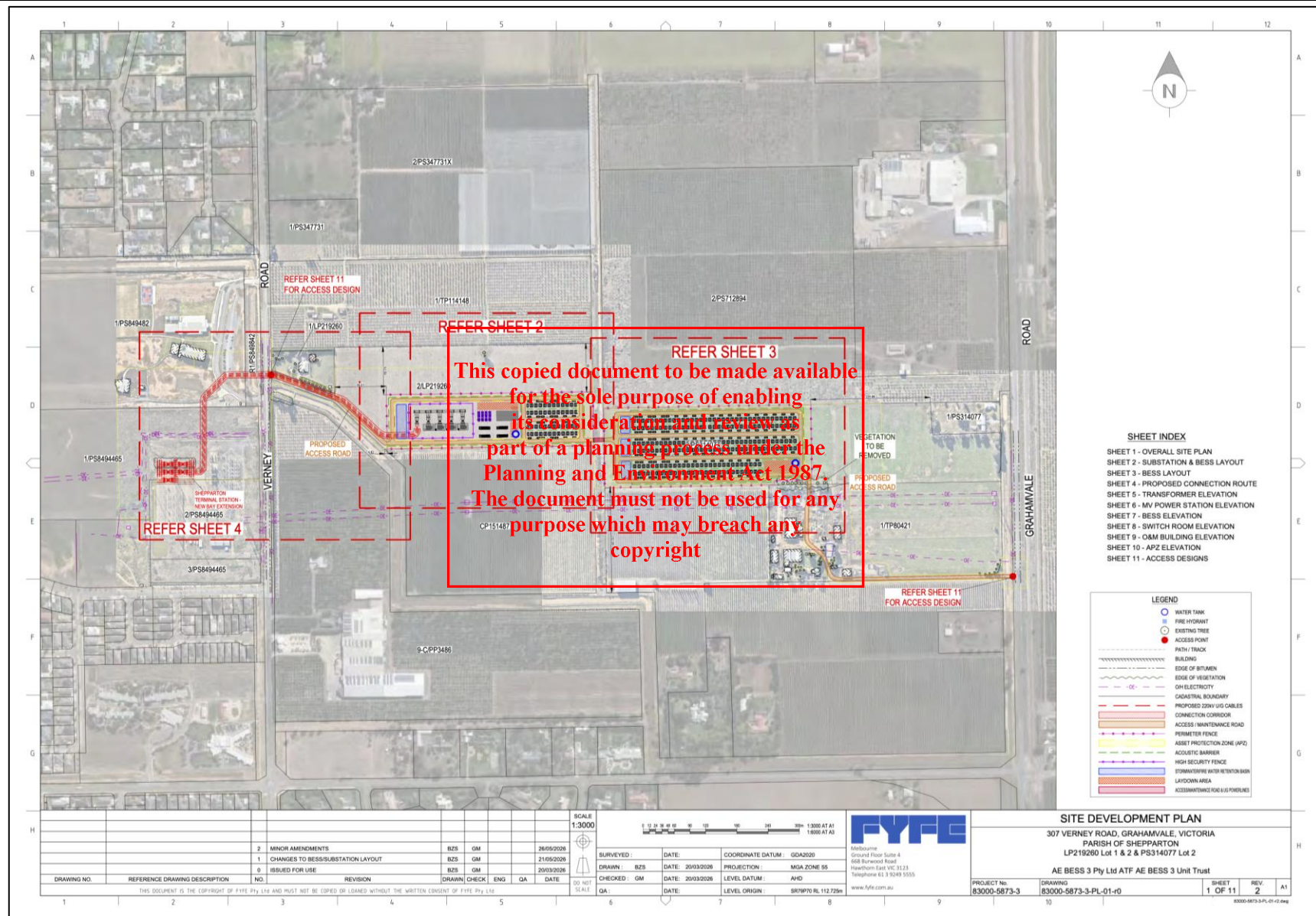


Figure 2 – Site Development Plan Rev 2 (Fyfe, 2026).

3 Guidelines for Renewable Energy facilities

FRV Guidelines apply and the CFA Guidelines are used to inform the pre-permit consultation process. The following tables are to be completed to indicate the intention to comply with the listed measures. Further details will be provided at the design and development phase.

3.1 FRV Battery Energy Storage Systems Guideline No. 55 (GL-55)

The FRV GL-55 Guidelines classify BESS facilities by scale, use, indoor/outdoor and proximity to occupied buildings. The Grahamvale BESS comprises an outdoor utility scale BESS facility with an estimated aggregate capacity of 1,920 MWh, located more than 200 m from habitable structures. A risk assessment process applies (see the accompanying FRA (RMP) document), with the extent of the risk assessment process (in terms of type of assessments and documents to be provided) is documented at Appendix A of the GL-55 Guidelines. With reference to that Appendix, the Grahamvale BESS requires an FRA, and documentation of the following matters (from FRV GL-55).

Section 8.1 Technical reference documents

Unless otherwise specified by this guideline, the current version of the following standards should be utilised for the design and operation of BESS (FRV, 2025).

Standard	Compliance
AS/NZS 4681: The storage and handling of Class 9 (miscellaneous) dangerous goods and articles.	
AS 3959: Construction of buildings in bushfire prone areas.	
AS/IEC 62619: Secondary cells and batteries containing alkaline or other non-acid electrolyte – Safety requirements for secondary lithium cells and batteries, for use in industrial applications.	
AS/NZS 5139: Electrical installations – Safety of battery systems for use with power conversion equipment.	
IEC 62897: ED1 Stationary Energy Storage Systems with Lithium Batteries – Safety Requirements.	
NFPA 855: Standard for the Installation of Stationary Energy Storage Systems.	
UL 9540: Energy Storage System Requirements.	
UL9540A: Battery Energy Storage System (ESS) Test Method.	
FM Global Property Loss Prevention Data Sheet 5-33: Electrical Energy Storage Systems.	
FM Global Property Loss Prevention Data Sheet 5-32: Data Centres and Related Facilities (FRV, 2025).	

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Section 8.3 Separation of equipment on site

The Fire Safety Study (FSS)² must outline strategies to prevent fire spread between equipment, supported by fire testing or engineering evaluation, with appropriate consideration given to the following matters (FRV, 2025).

Measure	Compliance
A deterministic analysis should consider credible fire scenarios and determine adequate control measures to demonstrate that a fire will not propagate from the initiating module or unit, i.e. mitigation of escalation. During the design phase, the deterministic analysis should be represented within a fire engineering evaluation. Prior to or during the project's commissioning phase, it may be necessary to undertake bespoke fire testing to validate the operation of the control measures.	
Where controlled burn out is proposed for the site, separation distances between equipment are required to be quantitatively validated to mitigate potential for fire spread between equipment onsite.	
The calculated total heat release rate and time to total burn out for a BESS unit fire event are also to be provided in this analysis.	
Separation distances between equipment and other exposures, e.g., allotment boundary, buildings, storage of hazardous materials, access tracks for emergency services and so on are to be substantiated.	
Transformer fires inducing thermal runaway exposure to neighbouring BESS units should be considered. It is noted that the separation distances referred to in AS 2067- 2018 [10] do not consider this issue. The spatial separation requirements of AS 2067- 2018 or any deviation from this standard, must be validated by consequence modelling.	

Section 8.4 Ventilation

BESS units, cabinets, or containers should be equipped with adequate ventilation in accordance with the manufacturer's requirements (FRV, 2025). Note most ventilation requirements apply to where a BESS is constructed within buildings; this is not applicable at the Grahamvale BESS.

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² Note: Appendix A to GL-55 indicates that a FSS is not required for the Grahamvale BESS. This FMP lists these measures with the purpose of demonstrating that the measures listed are being addressed as part of the design of the BESS.

Measure	Compliance
The FSS for any facility proposing to contain a BESS must demonstrate through a deterministic analysis that is informed by suitable qualitative or quantitative methods that the ventilation system is adequate for managing the flammable, corrosive, and toxic vapours and gases produced during a thermal runaway event.	
It is expected that the deterministic analysis will address how the accumulation of flammable and toxic vapours or gases will be managed via adopted engineering controls, such as detection and mitigation systems.	
A scenario that considers thermal runaway, which is generated by a flammable atmosphere, requires a consequence assessment to evaluate the impact of an ignition leading to deflagration or explosion on surrounding racks or units, supporting infrastructure, and other nearby elements or structures.	

Section 8.5 Access

FRV recommends site access is provided around the full perimeter of the installation with the provision of a least two points of access throughout the facility. The number of access points must be informed through a risk management process, developed in consultation with FRV (FRV, 2025). GL-55 refers to the CFA Guidelines as a means to addressing access requirements (see Section 4.1.1).

Section 8.6 Firefighting water

At a minimum, FRV requires the installation of a hydrant system that complies with the requirements of AS 2419.1:2021. BESS installations are classified as special hazard areas and must be assessed in accordance with Appendix E of the standard (FRV, 2025).

Measure	Compliance
External fire hydrants must be strategically located and remain easily accessible to responding firefighters. The facility should have appropriate water supplies that are compatible with the fire suppression and exposure protection requirements for the identified fire scenario of the BESS facility, as determined in the FSS.	
The location of any external hydrant shall be situated outside of a 3 kW/m ² radiant heat contour.	
Consideration must also be given to the containment of firefighting water which will vary from site to site.	

Note that the CFA Guidelines provide options for compliance (see Section 4.1.2).

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Section 8.9 Commercial and industrial, and utility scale BESS facilities

Signage should be installed at strategic locations based on a thorough site assessment. This includes all facility entrances, the main control room, and electrical and chemical hazards (FRV, 2025).

Measure	Compliance
A red visual alarm device (VAD) that conforms with AS ISO 7240.3-2021 [13], should be affixed to the wall, at or near the entrance to an occupiable physical enclosure that contains the BESS.	
The activation of the VAD should be initiated by the installed detection system, battery management system (BMS) or any other automatic or manual protection measure that may be in place.	

Further measures include:

Section 9 Commissioning

FRV's Dangerous Goods Unit must be notified no less than 30 days before the commissioning of the BESS (FRV, 2025).

Measure	Compliance
Notifications should be made in writing and sent to dangerousgoods@frv.vic.gov.au.	

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Section 9.1 Provision of an Emergency Information Book

BESS facilities present unique hazards for firefighters during an emergency response. Providing accurate and current information about potential risks and hazards to emergency responders is crucial for effective intervention, minimising response delays, and ensuring the safety of responders (FRV, 2025).

Measure	Compliance
For a utility scale BESS, and a commercial and industrial scale BESS within an indoor setting, an Emergency Information Book (EIB) shall be prepared and situated within the site's Emergency Information Container (EIC).	
For guidance on how to prepare an EIB, please refer to FRV's Emergency Information Book publication: Fire Rescue Victoria. (2021). Emergency Information Book. State of Victoria (Fire Rescue Victoria). https://www.frv.vic.gov.au/sites/default/files/2021-04/EIB%20Information.pdf .	

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Section 9.2 Emergency Response Plan (ERP)

The ERP is a key component of an EIB. The ERP must be developed with consideration of the specific hazards posed by the site and should meet the operational requirements of FRV. Recommendations from the FSS should be incorporated into the ERP (FRV, 2025). The CFA Guidelines also call for an Emergency Management Plan (see Section 7.1) and provide a detailed structure for such a plan.

Measure	Compliance
a. Procedures for alerting the owner/operator to abnormal operations, faults, or hazards in the BESS.	
b. Procedures for notifying fire services of an incident. FRV preference is for an automatic notification. That is, upon detection of a fire in the BESS or on the site via an automatic detection system, notification to the fire services should be immediate.	
c. Communication strategies with the remote operator representative during an incident.	
d. Arrangements for the attendance of an emergency liaison officer (ELO) on site during any incident.	
e. Clear procedures for communicating critical battery status and operational information to emergency services. This includes details on the activation of deflagration panels and other essential safety measures.	

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Section 9.3 Open Yard Storage of BESS

Most BESS projects involve the import of containerised units from international manufacturers, which are then temporarily stored in open areas such as ports, depots, wharfs, or project staging areas before installation. FRV recommends the following measures to reduce fire risks and support firefighting efforts (FRV, 2025).

Measure	Compliance
a. Cluster Segregation: BESS units should be grouped into clusters, with each not exceeding 50 meters in length.	
b. Separation Distances: Maintain at least 6m from fire hazards. e.g., buildings, boundaries and 1m within clusters for access panels, doors, or vents.	
c. Stacking Restrictions: For utility scale BESS and commercial and industrial scale BESS, racks and/or containers should not be stacked.	

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d. Firefighting Access: Provide perimeter access for fire brigade vehicles in line with firefighting guidelines.	
e. Operational Firefighting Equipment: Fire hydrants and suppression systems should be functional before delivery and storage.	
f. Fire Protection Measures: If firefighting equipment is not available, ensure alternative fire protection is available, especially in bushfire-prone areas.	
g. State of Charge (SOC) Limits: Each battery module should adhere to SOC limits set by manufacturers (usually 30%), the International Maritime Dangerous Goods Code, or UN Transport Regulations.	
h. Battery Management System (BMS): BMS should be active and monitored per manufacturer guidelines.	
i. Communication Strategy: Implement a system to monitor BMS status and notify of any abnormal conditions.	
j. Emergency Plan: Prepare an emergency response plan, considering potential hazards and regulatory requirements.	

3.2 CFA Design Guidelines for Renewable Energy Facilities

The *Design Guidelines and Model Requirements Renewable Energy Facilities* (CFA, 2023) call for consultation with CFA (in the case of the Grahamvale BESS this will be FRV) and provide guidance on designing, constructing, and operating new renewable energy facilities, including a BESS. The CFA Guidelines include standard measures and processes in relation to fire safety, risk and emergency management. Measures include those to be applied in the development of all renewable energy installations, shown in this report as pink tables:

Model Requirements – all facilities

and others specific to battery installations, shown in this report as light orange tables:

Model or Additional Requirements – BESS specific

Of relevance to the Grahamvale BESS are:

- Consideration of applicable Australian standards.
- Meeting the requirements of the planning approvals process.
- Risk management planning (addressed in an accompanying report).
- Facility location and design.
- Construction, commissioning, and operational procedures.

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- Emergency management planning (addressed in an accompanying report).
- Incorporating CFA input re dangerous goods for battery storage facilities.
- Occupational Health and Safety requirements.
- Provision of information to, and consultation with CFA on the above-mentioned points.

This draft FMP forms part of the engagement process with FRV, although it is structured around the CFA Guidelines. Where the FRV GL-55 provides specific measures for a particular requirement, the equivalent CFA requirement has been removed.

3.3 CFA Guidelines relevant standards

The applicable standards listed in the CFA Guidelines are amongst those required in the FRV GL-55 Guidelines. Compliance with those standards must be assured (see Section 3.1 above).

3.4 Fire Management Plan

3.4.1 Fire Management Plan

Model Requirement – all facilities A Fire Management Plan must be developed for the facility, in consultation with CFA, before development starts.	This copied document to be made available for the sole purpose of enabling consideration and review as part of a planning process under the Planning and Environment Act 1987.	
Model Requirement – all facilities If your facility is at-risk of bushfire, prevention and preparedness activities must be detailed in the Fire Management Plan.	The document must not be used for any purpose which may breach any copyright	

The CFA Guidelines require that the FMP incorporates the information in Table 1 below. For an assessment of the identified of the hazards and risks associated with the Grahamvale BESS, see the accompanying RMP. This FMP has been adapted to include the requirements of the FRV GL-55 and the CFA requirements are listed here as a credible format for the provision of information to FRV during the consultation and application process.

Table 1 - Fire Management Plan structure and content (CFA, 2023).

Requirement	Description
A summary of fire hazards and risks to and from the site, specific to its location, infrastructure, activities and occupancy.	Based on sound hazard identification and risk management processes. This must include risks to firefighter safety during emergencies.
Description of control measures to prevent fire occurring and limit the consequences of fire at the facility.	Fire permits, ignition source controls, hot work permits, job hazard analyses, infrastructure/vehicle/equipment/road/fence/access maintenance, waste management, compliant dangerous goods storage and handling, vegetation/fuel reduction and management, peat management, Emergency Plan.

<i>Description of control measures to prevent and reduce the consequences of external fire impacting the facility.</i>	<i>Bushfire monitoring, bushfire preparedness, reduced personnel presence/activities/travel on days of Severe and above Fire Danger Rating, creation and management of fire breaks at the site perimeter and around infrastructure, vegetation/fuel reduction and management, Emergency Plan.</i>
<i>Details of equipment and resources to manage fire at the facility.</i>	<i>Fire detection and suppression systems, fire water supplies, automatic shut-down and isolation systems, monitored alarms, communications equipment, occupant warning systems, designated evacuation assembly areas, Emergency Information Container(s), Emergency Plan.</i>
<i>Policies and procedures that ensure all control measures are appropriate and effective, and remain so.</i>	<i>Performance standards for risk controls, specific activities to verify controls (servicing/maintenance, housekeeping inspections, external audits), review processes for risk control effectiveness.</i>
<i>Procedures for review of the Fire Management Plan.</i>	<i>Review triggers and schedule, organisational accountability for the Plan, allocated responsibilities (to persons or roles) for the ongoing review and development of the Plan.</i>

3.4.2 FMP Requirement 1

A summary of fire hazards and risks to and from the site, specific to its location, infrastructure, activities and occupancy.

Based on sound hazard identification and risk management processes. This must include risks to firefighter safety during emergencies.

The risks identified in the accompanying RMP are summarised as broad categories here.

Table 2 –Risk summary.

Hazard	Risk
1). External bushfire	There is potential that during the declared Fire Danger Period a large, established bushfire impacts the Grahamvale BESS and causes injury or loss of life to people on site, financial loss through damage to site infrastructure and/or disruption to operation of the BESS.
2). BESS ignition	There is potential that during the declared Fire Danger Period an accidental or deliberate ignition on site will result in a bushfire that will spread and cause injury or loss of life to people on site, financial loss through damage to site infrastructure and/or neighbouring properties, and/or disruption to operation of the BESS.
3). BESS ignition - Electrical hazards and Noxious emissions	There is potential that an accidental or deliberate ignition on site will result in a fire in BESS infrastructure that causes injury or loss of life to people on site, financial loss through damage to site infrastructure, and/or disruption to operation of the BESS and neighbouring properties.
4). Hazardous material (Dangerous Goods)	There is potential that an accident or mechanical failure will result in the release of electrolyte or other harmful substance with potential to cause

	injury or loss of life to people on or near the site, financial loss through damage to site infrastructure and/or damage or disruption to neighbouring properties, and/or disruption to operation of the BESS.
All risks - Danger to staff and firefighters during emergency response.	

The RMP determined that the application of the FRV GL-55 Guidelines and, where appropriate, the Model Requirements and BESS specific Additional Requirements of the CFA Guidelines, can adequately mitigate the risk to and from the site. This FMP details the measures to be applied at the Grahamvale BESS to provide information to FRV during the consultation and application process.

FMP requirements 2 – 6 (from Table 1) are summarised at Table 3.

Table 3 – Response to FMP requirements summary.

Item	Response
<i>'Description of control measures to prevent fire occurring and limit the consequences of fire at the facility.</i> <i>Fire permits, ignition source controls, hot work permits, job hazard analyses, infrastructure/vehicle/equipment/road/fence/access maintenance, waste management, compliant dangerous goods storage and handling, vegetation/fuel reduction and management, peat management³ Emergency Plan.</i>	These matters are addressed in this FMP from Section 4 and in the EMP (ERP) (see Section 7).
<i>'Description of control measures to prevent and reduce the consequences of external fire impacting the facility.</i> <i>Bushfire monitoring, bushfire preparedness, reduced personnel presence/activities/travel on days of Severe and above Fire Danger Rating, creation and management of fire breaks at the site perimeter and around infrastructure, vegetation/fuel reduction and management, Emergency Plan'.</i>	These matters are addressed in this FMP from Section 4 and in the EMP (ERP) (see Section 7).
<i>'Details of equipment and resources to manage fire at the facility.</i> <i>Fire detection and suppression systems, fire water supplies, automatic shut-down and isolation systems, monitored alarms, communications equipment, occupant warning systems, designated evacuation assembly areas, Emergency Information Container(s), Emergency Plan'.</i>	These matters are addressed in this FMP from Section 4 and in the EMP (ERP) (see Section 7).
<i>'Policies and procedures that ensure all control measures are appropriate and effective, and remain so.</i> <i>Performance standards for risk controls, specific activities to verify controls (servicing/maintenance, housekeeping</i>	Management details to be added at detailed design stage.

³ Not applicable to the Grahamvale BESS.

inspections, external audits), review processes for risk control effectiveness’.	
‘Procedures for review of the Fire Management Plan. Review triggers and schedule, organisational accountability for the Plan, allocated responsibilities (to persons or roles) for the ongoing review and development of the Plan’.	Model Requirements and BESS specific Requirements that call for an EMP (ERP) (see Section 7) will be addressed in the EMP (ERP) to be provided as a separate document.

4 Operational controls

4.1 Facility design

‘Renewable energy facilities must be designed to eliminate or reduce the risk of fire occurring and if it does occur, its consequences’ (CFA, 2023).

4.1.1 Emergency vehicle access

The CFA Guidelines require that access for emergency vehicles is provided at the Grahamvale BESS, that complies with the Model Requirements below.

Model Requirements – all facilities

- Construction of a four (4) metre perimeter road within the perimeter fire break.
- Roads must be of all weather construction and capable of accommodating a vehicle of fifteen (15) tonnes (eg., no compacted earth).
- Constructed roads should be a minimum of four (4) metres in trafficable width with a four (4) metre vertical clearance for the width of the formed road surface. Ensure any fencing along access routes allows for width of fire vehicles.
- The average grade should be no more than 1 in 7 (14.4% or 8.1°) with a maximum of no more than 1 in 5 (20% or 11.3°) for no more than fifty (50) metres.
- Dips in the road should have no more than a 1 in 8 (12.5% or 7.1°) entry and exit angle.
- Roads must incorporate passing bays at least every 600 metres, which must be at least twenty (20) metres long and have a minimum trafficable width of six (6) metres. At least one passing bay must be incorporated where roads are less than 600 metres long.
- Road networks must enable responding emergency services to access all areas of the facility, including fire service infrastructure, buildings, and battery energy storage systems and related infrastructure, substations and grid connection areas.
- The provision of at least two (2) but preferably more access points to each part of the facility. The number of access points must be informed through a risk management process, in consultation with the CFA.

Model Requirement – BESS specific

At least two access points are to be provided into each section where battery energy storage systems are located. The number and location of vehicle access points must be determined in consultation with CFA.

Response

Item	To be provided yes/no or equivalent, proposed details	
Model requirements – all facilities	a)	4 m perimeter road shown on Map 1.
	b)	Roads will be all weather construction.
	c)	Access as proposed meets requirement.
	d)	Access as proposed meets requirement.
	e)	Access as proposed meets requirement.
	f)	Access as proposed meets requirement (internal roads are 7 m wide)
	g)	Access as proposed meets requirement.
	h)	Two points of access are provided.
Additional requirements – BESS Specific	Two points of access are provided.	

Illustrative examples relating to the access requirements from the CFA Guidelines can be found in Appendix A – Access requirements.

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4.1.2 Firefighting water supply

Model Requirements – all facilities

- a) Water access points must be clearly identifiable and unobstructed to ensure efficient access.
- b) Static water storage tank installations must comply with AS 2419.1-2021: Fire hydrant installations – System design, installation and commissioning.
- c) The static water storage tank(s) must be an above-ground water tank constructed of concrete or steel.
- d) The static water storage tank(s) must be capable of being completely refilled automatically or manually within 24 hours.
- e) The static water storage tanks must be located at vehicle access points to the facility and must be positioned at least ten (10) metres from any infrastructure (solar panels, wind turbines, battery energy storage systems, etc.).
- f) The hard-suction point must be provided, with a 150mm full bore isolation valve (**Image 1** in Appendix B – Water requirements) equipped with a Storz connection, sized to comply with the required suction hydraulic performance.
Adapters that may be required to match the connection are: 125mm, 100mm, 90mm, 75mm, 65mm Storz tree adapters (**Image 2** in Appendix B – Water requirements) with a matching blank end cap to be provided.
- g) The hard-suction point must be positioned within four (4) metres to a hardstand area and provide a clear access for emergency services personnel.
- h) An all-weather road access and hardstand must be provided to the hard-suction point. The hardstand must be maintained to a minimum of 15 tonne GVM, eight (8) metres long and six (6) metres wide or to the satisfaction of the CFA.
- i) The road access and hardstand must be kept clear at all times.
- j) The hard-suction point must be protected from mechanical damage (eg. bollards) where necessary.
- k) Where the access road has one entrance, an eight (8) metre radius turning circle must be provided at the tank.
- l) An external water level indicator must be provided to the tank and be visible from the hardstand area.
- m) Signage (**Image 3** in Appendix B – Water requirements) indicating 'FIRE WATER' and the tank capacity must be fixed to each tank.
- n) Signage (**Image 4** in Appendix B – Water requirements) must be provided at the front entrance to the facility, indicating the direction to the static water tank.

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Additional Requirements – BESS specific

A fire protection system suitable for the risks and hazards at the facility must be provided.

For battery energy storage systems, the water supply quantity must:

- Enable effective cooling of surrounding infrastructure.
- Account for reasonable duration of fire events based on the proposed battery chemistry.
- Account for local weather conditions and potential fire weather conditions.
- Provide for the safety of firefighters.

The fire protection system must be designed in line with the requirements of AS 2419.1-2021: Fire hydrant installations, Clause 3.9: Open Yard Protection, in consultation with CFA.

For the purposes of determining system requirements, the 'yard area' referenced within AS 2419.1, Table 2.2.5(D) may be considered that of the battery installation, including the minimum 10m fire break around the battery infrastructure, rather than the entire area of the yard or site.

Emergency response experience from battery energy storage system incidents indicates that larger quantities of water may be required.

Note: Clause 3.9: Open Yard Protection of AS 2419.1-2021: Fire hydrant installations states: 'Fire hydrants shall be provided and located so that all storage, production equipment and plant in the protected area is not more than 70 m from an external fire hydrant outlet'.

The Grahamvale BESS yard area is >27,000 m² and must provide a minimum of 4 hydrants required to flow simultaneously (from Table 2.2.5 (D) to AS 2419.1-2021). The site has access to reticulated water; currently no specific water storage volume is proposed and CFA input is sought to determine the appropriate volume.

Response

Item	To be provided yes/no or equivalent, proposed details	
Model requirements – all facilities	a) to n)	Static water supply volume to be determined in consultation with FRV.
Additional requirements – BESS Specific	Static water supply volume to be determined in consultation with FRV, and hydrant distribution/compliance with <u>AS 2419.1-2021: Fire hydrant installations</u> .	

See Appendix B – Water requirements for further detail and illustrations on specific signage/layout examples.

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Model Requirements – BESS specific

Where battery energy storage systems are ancillary to solar or wind energy facilities and proposed within a single centralised location, fire protection in accordance with the model requirements in this section must be provided.

1) For facilities with centralised battery energy storage systems, the fire protection system must include at a minimum:

- a) Where reticulated water is available, a fire hydrant system that meets the requirements of AS 2419.1-2021: Fire hydrant installations, Section 3.9: Open Yard Protection, and Table 2.2.5(D):

Number of Fire Hydrants Required to Flow Simultaneously for Protected - Open Yards.

Except, that fire hydrants must be provided and located so that every part of the battery energy storage system is within reach of a 10m hose stream issuing from a nozzle at the end of a 60m length of hose connected to a fire hydrant outlet.

(see **Image 5** in Appendix B – Water requirements)

OR

- b) Where no reticulated water is available, a fire water supply in static storage tanks, where:

- i. The fire water supply must be of a quantity no less than 288,000L or as per the provisions for Open Yard Protection of AS 2419.1-2021: Fire Hydrant installations, Table 2.2.5(D) for open yards flowing for a period of no less than four hours at 20L/s, whichever is the greater.
- ii. The quantity of static fire water storage is to be calculated from the number of hydrants required to flow from AS 2419.1-2021: Fire hydrant installations, Table 2.2.5(D).
(E.g., For battery installations with an aggregate area of over 27,000m², 4 (four) hydrant outlets are required to operate at 10L/s for four hours, which equates to a minimum static water supply of 576kL.)
- iii. Fire hydrants must be provided and located so that every part of the battery energy storage system is within reach of a 10m hose stream issuing from a nozzle at the end of a 60m length of hose connected to a fire hydrant outlet.
- iv. The fire water supply must be located at vehicle entrances to the facility, at least 10m from any infrastructure (electrical substations, inverters, battery energy storage systems, buildings).
- v. The fire water supply must be reasonably adjacent to the battery energy storage system and shall be accessible without undue danger in an emergency. (E.g., Fire water tanks are to be located closer to the site entrance than the battery energy storage system).
- vi. The fire water supply must comply with AS 2419.1-2021: Fire hydrant installations, Section 5: Water storage tanks.

(see **Image 6** in Appendix B – Water requirements)

The Grahamvale BESS is a 'centralised' facility, however, it is not ancillary to solar or wind energy facilities. Consequently, this BESS specific Model requirement is not applicable.

Response

Item	To be provided yes/no or equivalent, proposed details		
Additional requirements – BESS Specific	a)	n/a	
	OR		
	b)	i.	n/a

		ii.	
		iii.	
		iv.	
		v.	
		vi.	

4.1.3 Fire detection and suppression equipment

Model Requirements – All facilities

Suitable fire detection and suppression equipment must be provided:

- For on-site buildings and structures, according to the requirements of the National Construction Code.
- For storages of dangerous goods, according to the requirements of any Australian Standards for storing and handling of dangerous goods.
- For electrical installations, a minimum of two (2) suitable fire extinguishers must be provided within 3m-20m of each PCU.
- In all vehicles and heavy equipment, each vehicle must carry at least a nine (9)-litre water stored-pressure fire extinguisher with a minimum rating of 3A, or other firefighting equipment as a minimum when on-site during the Fire Danger Period.

Response

Item	To be provided yes/no or equivalent, proposed details
a)	Fire detection systems to be provided in accordance with NCC. TBC
b)	No dangerous goods will be stored onsite. TBC
c)	One fire extinguisher to be provided on each PCU as there are multiple PCUs within 20 m.
d)	All vehicles have fire extinguishers. TBC

4.1.4 Landscape screening and on-site vegetation

'Any proposed or existing vegetation must be considered in the Risk Management Plan for its potential to intensify and propagate fire within and away from the site.'

Radiant heat impact leading to ignition may be mitigated through:

- Vegetation removal (where permitted).
- Separation from nearby infrastructure (e.g., fire breaks; refer below).
- The provision of thermal barriers at nearby infrastructure.
- Other means in consultation with CFA' (CFA, 2023).

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Response

Item	To be provided yes/no or equivalent, proposed details
Point 1	As determined in the RMP, vegetation close to the Grahamvale BESS is sufficiently separated from the battery array and site facilities such that the risk of fire to, and from, the site infrastructure is mitigated to an acceptable level. The site will be maintained in a low threat state.
Point 2	
Point 3	
Point 4	

4.1.5 Fire breaks

Model Requirements – all facilities

A fire break must be established and maintained around:

- The perimeter of the facility, commencing from the boundary of the facility or from the vegetation screening inside the property boundary.
- The perimeter of control rooms, electricity compounds, substations and all other buildings on-site.

The width of fire breaks must be a minimum of 10 m, and at least the distance where radiant heat flux (output) from the vegetation does not create the potential for ignition of on-site infrastructure.

Model Requirement – BESS specific

A fire break must be established and maintained around battery energy storage systems and related infrastructure.

Response

Item	To be provided yes/no or equivalent, proposed details	
Model requirements – all facilities	a)	Two points of access are provided.
	b)	The entire Grahamvale BESS site will comprise non-vegetated areas or areas where vegetation is maintained in a low threat state (see Map 1).
Additional requirements – BESS Specific	As per points a) and b).	

4.1.6 Design specific to facility type

The current versions of *NFPA 855: Standard Installation of Stationary Energy Storage Systems*, *UL 9540: Energy Storage System Requirements* and *FM Global Property Loss Prevention Data Sheet 5-33 (2020) Electrical Energy Storage Systems*, should be used in the design and operation of BESSs, except where they are varied by the CFA Guidelines.

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Model Requirements – BESS specific

1) The design of the facility must incorporate:

- a) A separation distance that prevents fire spread between battery containers/enclosures and:
 - Other battery containers/enclosures.
 - On-site buildings.
 - Substations.
 - The site boundary.
 - Any other site buildings.
 - Vegetation.

Separation must be at least the distance where the radiant heat flux (output) from a battery energy storage system container/enclosure fully involved in fire does not create the potential for ignition of these site elements.

- b) A fire break around the battery energy storage system and related infrastructure, of a width of no less than 10 m, or greater where determined in the Risk Management Plan. Fire breaks must be non-combustible, constructed of concrete, mineral earth, or non-combustible mulch such as crushed rock. The width must be calculated based on the ignition source being radiant heat of surrounding vegetation, including landscaping.
- c) A layout of site infrastructure that:
 - i. Considers the safety of emergency responders.
 - ii. Minimises the potential for grassfire and/or bushfire to impact the battery energy storage system.
 - iii. Minimises the potential for fires in battery containers/enclosures to impact on-site and off-site infrastructure.

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2) Battery energy storage systems must be:

- a) Located so as to be reasonably adjacent to a suitable fire service vehicle access (suitable for emergency vehicles).
- b) Located so that the site entrance and any fire water tanks are not aligned to the prevailing wind direction (therefore least likely to be impacted by smoke in the event of fire at the battery energy storage system.)
- c) Provided with in-built fire and gas detection systems. Where these systems are not provided, measures to effectively detect fires within containers must be detailed within the Risk Management Plan.
- d) Provided with explosion prevention via sensing and venting, or explosion mitigation through deflagration panels.
- e) Provided with suitable ember protection to prevent embers from penetrating battery containers/enclosures.
- f) Provided with suitable access roads for emergency services vehicles, to and within the site, including to battery energy storage system(s) and fire service infrastructure.
- g) Installed on a non-combustible surface such as concrete.
- h) Provided with adequate ventilation.
- i) Provided with impact protection to at least the equivalent of a W guardrail-type barrier, to prevent mechanical damage to battery containers/enclosures.
- j) Provided with enclosed wiring and buried cabling, except where required to be above-ground for grid connection.
- k) Provided with spill containment that includes provision for management of fire water runoff.

Response

Item	To be provided yes/no or equivalent, proposed details	
Additional requirements – BESS Specific: 1.	a)	To be incorporated in detailed design.
	b)	10 m firebreak is provided (see Section 4.1.5).
	c)	i. To be incorporated into FMP and EMP (ERP).
		ii. The BESS is sufficiently removed from the hazardous vegetation such that the risk of ignitions from the BESS is mitigated (see accompanying RMP).
		iii. To be provided via vegetation control and clearance between BESS and other site facilities.
Additional requirements – BESS Specific: 2.	a)	Proposed layout meets this requirement.
	b)	Two 144,000 L static water supply tanks are proposed. Note that the site has access to a reticulated water supply for fire fighting purposes.
	c)	To be provided.
	d)	To be provided.
	e)	All battery cells are enclosed in IP55 enclosures.
	f)	Access as per Section 4.1.1 meets requirements of CFA Guidelines.
	g)	All BESS modules are installed on existing hardstands.
	h)	All BESS enclosures will be provided with adequate ventilation.
	i)	To be considered at the detailed design stage – requires clarification with FRV.
	j)	All cables will be installed underground, except internal wires within the BESS units and other key infrastructure.
	k)	The retention basin will be shown on the proposed layout.

CFA recommends a containment and management capacity equivalent to the on-site fire protection system. Containment is to be provided as per *AS 4681- 2000: The storage and handling of class 9 dangerous goods*.

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4.1.7 Safety and protective systems

Additional Requirements – BESS specific

Battery Energy Storage System Safety and Protective Systems

Safety and protective systems will vary in battery energy storage systems based on battery technologies, chemistries, and the preferences of manufacturers. These systems may add a layer of protection during high-consequence emergency scenarios.

CFA recommends that battery energy storage systems are equipped with the following elements:

Battery management/monitoring systems for monitoring the state of battery systems to ensure safe operation.

Systems for detecting smoke, heat (thermal), fire and toxic gas (off-gassing) within battery containers. Detection systems for off-gassing must be single-trigger and provide for both lighter and heavier than air gasses.

Systems to prevent heat/fire spread within battery containers (such as thermal barriers, shut-down separators, isolation systems, cooling systems).

Systems to prevent explosion within battery containers (such as ventilation, pressure relief and exhaust systems).

Systems to prevent water ingress to battery containers and appropriate ingress protection (IP) ratings for containers/cabinets and/or battery modules.

Warning and alarm systems with audible and/or visible capability, to enable early warning for faults, operation of the battery energy storage system above 'normal'/safe parameters, smoke, off-gassing, and fire.

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Response

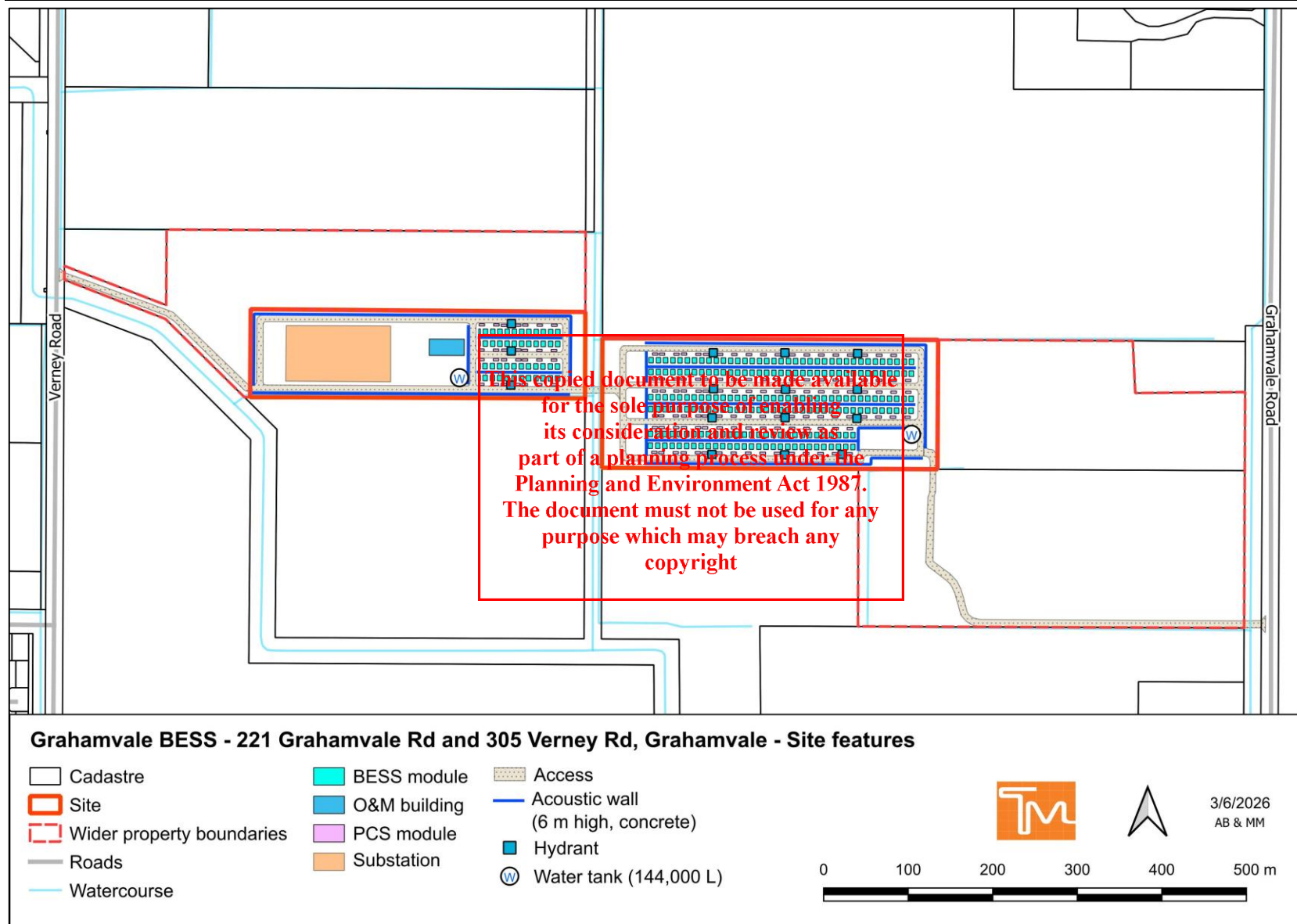
Item	System	To be provided yes/no or equivalent, proposed details
Additional requirements – BESS Specific	Battery management/monitoring systems	To be provided as part of the battery BMS.
	Systems for detecting	To be provided as part of the battery BMS.
	Systems to prevent heat/fire spread	Battery modules are physically separated within containers to prevent thermal runaway from spreading.
	Systems to prevent explosion	Containers are equipped with pressure relief that vent pressure and flammable gases safely during an incident. (TBC at detailed design).
	Systems to prevent water ingress	Battery containers will have correct IP ratings suitable for the environment installed.
	Warning and alarm systems	Battery BMS will provide real time warning and alarm to the site SCADA system for early warning for faults, operation of the BESS above 'normal'/safe parameters.

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Grahamvale BESS – Fire Management Plan



Map 1 – Facility design including setbacks and fire break for the Grahamvale BESS.

5 Facility construction and commissioning

The RMP identified that the construction and commissioning phase is a period of increased likelihood and consequence of risks. This section is to be completed by operators of the BESS.

5.1 Construction

5.1.1 Fire detection and suppression systems

- 'Install and commission fire detection and suppression systems for the facility at the earliest possible stage of construction.*
- Provide first-aid firefighting equipment, such as fire extinguishers, appropriate to the identified emergency scenarios, at all construction portables/buildings on-site, in the vicinity of all construction activities, and in site-based vehicles.*
- Provide the required fire protection equipment for any storages of dangerous goods as per the relevant Australian Standards' (CFA, 2023).*

Response

Item	
a)	Fire detection will be provided as part of the BESS containers.
b)	Will be provided as per the requirements.
c)	No dangerous goods will be stored on-site. If this changes, all appropriate measures will be applied.

5.2 Commissioning

5.2.1 Fire Risk Management

- 'Obtain appropriate permits for work during the Fire Danger Period and ensure that any conditions on permits are adhered to.*
- Adhere to restrictions on Total Fire Ban or days of elevated fire danger according to CFA's website.*
- During the Fire Danger Period, ensure vehicle operators are instructed to remain on tracks and are not permitted to drive through paddocks.*
- Restrict smoking to prescribed areas and provide suitable ash and butt disposal facilities.*
- Provide remotely-accessible site/system security monitoring at the facility' (CFA, 2023).*

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Response

Item	To be provided yes/no or equivalent
a)	Appropriate permits will be applied and enforced.
b)	To be documented in the CEMP (Construction Emergency Management Plan) and final FMP.
c)	
d)	
e)	The site will have remotely-accessible site/system security monitoring.

5.2.2 Personnel Training

- ‘Provide training for personnel in the use of on-site first-aid firefighting equipment, and responsibilities during emergencies.*
- Ensure all on-site personnel complete CFA’s online training module ‘Bushfire Safety for Workers’ (CFA, 2023).*

Click here: [Bushfire Safety for workers](#) for the online learning portal.

Response

Item	To be provided yes/no or equivalent
a)	To be documented in the CEMP and final FMP.
b)	

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5.2.3 Emergency Management

Model Requirement – all facilities

An Emergency Management Plan must be developed for the construction and commissioning phase before development starts.

The requirement to provide an Emergency Management Plan (including bushfire) is detailed in Section 7 of this RMP.

- ‘The Emergency Plan must address the requirements of Section 7 of this guideline.*
- An emergency communication system must be provided that is reliable and will operate in the event of power failure.*
- CFA must be notified at least seven (7) days prior to the commissioning of any high-risk infrastructure at the facility (e.g., battery energy storage systems)’ (CFA, 2023).*

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Response

Item	To be provided yes/no or equivalent
a)	Addressed by accompanying EMP (ERP).
b)	All operators will have a method of communication (type TBC) for communications in the event of power failure.
c)	To be documented in the CEMP and final FMP.

5.2.4 Occupational Health and Safety

‘CFA recommends the development of safe work procedures for the facility, encompassing but not limited to:

- Electricity and chemical management.
- Vegetation management.
- Site security.
- Ignition source control, including hot works.
- Infrastructure, equipment, and vehicle maintenance.
- Emergency management’ (CFA, 2023).

Response

Item	To be provided yes/no or equivalent
a)	Work procedures will be incorporated as part of the CEMP.
b)	Provision of 10 m fire break inside boundary and management of all vegetation within the site in a low threat state.
c)	Work procedures will be incorporated as part of the CEMP.
d)	Work procedures will be incorporated as part of the CEMP including Hot Work permits.
e)	Addressed by CEMP and daily pre-start inspections.
f)	Addressed by EMP (ERP).

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6 Facility operation

6.1 Fire hazards and risk controls

This section addresses the matters identified in the CFA Guidelines to address

- Bushfire and grassfire.
- Bushfire prevention and preparedness during the non-Fire Danger Period.
- Bushfire prevention and preparedness during the Fire Danger Period.

6.1.1 Vegetation and fuel management

Model Requirements – all facilities

Facility operators must undertake the following measures during the Fire Danger Period:

- Grass must be maintained at or below 100 mm in height during the declared Fire Danger Period.
- Long grass and/or deep leaf litter must not be present in areas where heavy equipment will be working, during construction or operation.
- Restrictions and guidance must be adhered to during the Fire Danger Period, days of **High** (and above) fire danger and Total Fire Ban days (refer to www.cfa.vic.gov.au).

Additional Requirements – BESS specific

Containers/enclosures and infrastructure for battery energy storage systems must be maintained to be clear of vegetation, including grass, for at least ten (10) metres on all sides, or greater as informed by the Risk Management Plan.

Response

Item	To be provided yes/no or equivalent	
Model requirements – all facilities	a)	All vegetation within the Grahamvale BESS site will be maintained in a low threat state.
	b)	
	c)	Public FDR warnings will be followed and hot work restrictions applied.
Additional requirements – BESS Specific	10 m non-vegetated land will be provided around all site infrastructure (see Map 1).	

Additional requirements – substations and electric lines

Managing Vegetation On-Site

- Gutters, roof surfaces and valleys, kerbs, traps, sumps, bunds, drains, roofs or any other accumulation points for leaf litter, dry vegetation, or any other combustible materials must be cleared, and the debris removed from site.
- Vegetation management activities must be conducted across the entire facility (e.g., grass slashing or mowing, removal of dead/fallen vegetation).

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- Extraneous materials or vegetation in firebreaks at the site perimeter, at external building walls, and at other any site plant/assets must be cleared and removed from site.
- Extraneous or unnecessary materials (fuel loads) must be removed from site, e.g., mulch piles; dilapidated/stored vehicles, plant or equipment; excess fuel/chemicals; any combustible waste materials. Vehicles must not be parked on unmanaged vegetation.

Item	To be provided yes/no or equivalent
Point 1	To be documented in the CEMP and final FMP.
Point 2	
Point 3	
Point 4	

6.1.2 Arc flash hazard management

‘Electrical equipment must be designed to reduce risks associated with arc flash hazards. Where an arc flash hazard exists it must be identified and managed.

There must be clear demarcation of arc boundaries to at least 10 m from arc flash outlet flaps (blow-out panels) on PCUs, where there is a hazard to personnel (CFA, 2023).

Response

Item	To be provided yes/no or equivalent
Demarcation of arc boundaries to at least 10 m from arc flash outlet flaps (blow-out panels) on PCUs	Will be addressed through layout design.

Further guidance can be found at: [Arc Flash Hazard Management Guidelines](#)

6.1.3 Facility and system monitoring

Model Requirement – all facilities

Appropriate monitoring for facility infrastructure must be provided, to ensure that any shorts, faults or equipment failures with the potential to ignite or propagate fire are rapidly identified and controlled. Any fire must be notified to 000 immediately.

Additional Requirements – BESS specific

For battery energy storage systems, appropriate monitoring and intervention measures must be provided to ensure that the following are rapidly identified and notified to 000 immediately:

- Any shorts, faults, temperature increases above normal parameters (e.g., precursor to thermal events/runaway).
- Equipment failures with the potential to ignite or propagate fire.
- Off-gassing, smoke or fire.

The provision for direct alarm monitoring to the fire brigade for battery energy storage system

automatic detection systems must be considered.

Response

Item	To be provided yes/no or equivalent	
Model requirements – all facilities	To be documented in the CEMP and final FMP.	
Additional requirements – BESS Specific	Point one	All points will be addressed by real-time monitoring of the battery energy storage system by the on-site SCADA system and push messaging system to 24/7 control room. The control room will be responsible for notifying fire brigade. No provision for direct alarm monitoring.
	Point two	
	Point three	

6.1.4 Maintenance

Model Requirements – all facilities

Inspection, maintenance, and any required repair activities must be conducted for all infrastructure, equipment and vehicles at the facility. Maintenance must be in line with any relevant Australian Standards and the manufacturer's requirements.

Additional Requirements – BESS specific

Battery energy storage systems, including the battery management system and any associated safety systems, must be regularly serviced to the manufacturer's specifications. A procedure, including a schedule and relevant personnel accountabilities, must be developed in relation to the inspection of battery energy storage systems.

Battery energy storage systems are to be regularly inspected for the following:

- Any signs of mechanical damage to the external containers/enclosures.
- Any accumulation of combustible materials (including leaf litter) in or within ten (10) metres of any battery energy storage systems and related infrastructure.

Any identified issues must be immediately rectified.

Response

Item	To be provided yes/no or equivalent	
Model requirements – all facilities	To be documented in the CEMP and final FMP.	
Additional requirements – BESS Specific	Procedure development	Will be addressed in OPEM and annual maintenance plan.
	Inspection	
	Point one	Will be addressed in OPEM and annual maintenance plan.
	Point two	

6.1.5 Dangerous goods storage and handling

The CFA Guidelines states that aspects of the facility such as signage, cleaning materials, training, documentation must be compliant with the *Dangerous Goods (Storage and Handling) Regulations 2022*. The requirements of the dangerous goods legislative framework, and all relevant Australian Standards must be complied with for all facilities, including facilities with battery energy storage systems.

Response

Item	To be provided yes/no or equivalent
<i>Dangerous Goods (Storage and Handling) Regulations 2022</i> compliance.	Will be applied.
Appropriate material for cleaning up dangerous goods spills and leaks (including absorbent, neutralisers, tools, disposal containers and personal protective equipment) must be provided and available on-site.	Will be provided.
Training must be provided for site personnel on the hazards, safe use and emergency response for spills, leaks and fire involving dangerous goods.	Will be provided.
All dangerous goods stored on-site must have a current Safety Data Sheet (SDS). Safety Data Sheets must be provided within the facility's Emergency Information Book(s), in the Emergency Information Container(s).	Will be provided.

6.1.6 Housekeeping

'Housekeeping must incorporate:

- 'Hazard identification - ensuring that infrastructure, plant, equipment, vehicles and safety/warning signs show no signs of damage or dilapidation.
- Facility access - ensuring all vehicle site access points, including emergency access points, are clear and accessible.
- Fire protection systems and equipment – ensuring that all equipment is unobstructed, clearly identifiable, in-service and performing optimally.
- Vegetation management - ensuring that any accumulation of combustible materials is cleared from infrastructure, buildings and fire breaks, and removed from the site.
- Security measures - ensuring that fences, gates, and security cameras are inspected for damage, and that any damage is immediately actioned (e.g., repaired or replaced)' (CFA, 2023).

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Housekeeping inspections must be conducted regularly at least every three months and again one month prior to the Fire Danger Period. Further information can be found at [CFA Renewable Energy Fire Safety Resources](#).

Item	To be provided yes/no or equivalent
a)	To be provided and incorporated into final FMP and site operations procedures and documentation.
b)	
c)	
d)	

6.1.7 Additional Requirements Specific to Facility Type

Additional Requirements – BESS specific

A Fire Management Plan for a facility that incorporates a battery energy storage system must also include:

- A schedule, list of activities and accountabilities for the inspecting, testing, monitoring and servicing of the battery and its monitoring, safety and protective systems.
- Monthly inspections of battery enclosures/containers and related infrastructure for physical damage. Any damage must be immediately assessed and rectified by a suitably qualified person.
- Seismic activity as a trigger for inspecting, testing and servicing of the battery energy storage system and its related infrastructure. Any damages or changes in operating parameters must be immediately assessed and rectified by a suitably qualified person.
- Regular inspection and removal of all combustible materials near the battery enclosures/containers and related infrastructure.

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Item	To be provided yes/no or equivalent
a)	To be provided and incorporated into final FMP and site operations procedures and documentation.
b)	
c)	
d)	

6.1.8 Fire risk review

'Fire risk must be effectively managed at operating facilities to meet obligations for providing a safe workplace under the OHS Act.

CFA recommends that facility operators consider the design guidelines and model requirements contained in this document and develop procedures to ensure that:

- The **Fire Management Plan** is reviewed and updated regularly, in line with any reviews and changes to hazards and risk management as per the **Risk Management Plan**, and where there is a near-miss or incident at the facility.

- b) The **Emergency Plan** is reviewed and updated to reflect any changes in the **Fire Management Plan**, including where fire risks emerge or change, risk controls are added or modified, or where there is a near- miss or incident at the facility’ (CFA,2023).

Item	To be provided yes/no or equivalent
a)	To be provided and incorporated into final FMP and EMP (ERP) and site operations procedures and documentation.
b)	

7 Emergency planning

‘Emergencies at renewable energy facilities must be planned for and effectively managed’ (CFA, 2023).

7.1 Emergency Management Plan

The ERP must be developed with consideration of the specific hazards posed by the site and should meet the operational requirements of FRV (FRV, 2025). FRV GL-35 requirements for an Emergency Response Plan (ERP) state: ‘In addition to standard content, the ERP should also address the following additional issues’ (FRV, 2025). The ‘standard content’ requirement can be met through compliance with emergency planning measures outlined in the CFA Guidelines 1987. The ‘.....following additional issues’ are listed at Section 3.1.1. Note that the CFA describe this plan as an Emergency Response Plan (EMP) rather than the FRV term ERP.

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Model Requirement – all facilities

An Emergency Management Plan must be developed specific to the facility, in conjunction with CFA, before development starts.

Additional Requirements – BESS specific

Emergency Plans for facilities with battery energy storage systems must additionally include:

- Contact information for 24/7/365 specialist technical support for the battery energy storage system.
- Emergency response procedures based on identified risks and hazards of the battery energy storage system and related infrastructure, including but not limited to:
 - Electrical infrastructure faults and fire.
 - Battery energy storage system damage or faults, including battery monitoring faults, temperature increases above normal operating parameters, electrical faults, chemical spills or reactions, off-gassing, thermal events/runaway, smoke and fire.
 - Bushfire and grassfire.
 - The management of fire water runoff.
- Details of the elements monitored/controlled by the Battery Management System (BMS), including internal temperature, state of charge, voltage, etc. and the locations this information is available (e.g., at the BESS containers, in an on-site control room, off-site monitoring facilities).

- d) A plan for partial and full decommissioning of the battery energy storage system in the event of an emergency incident that renders the facility inoperable or unsafe, before its anticipated end-of-life.
- e) Any information that supports the considerations in Appendix B: Emergency Response Considerations for Large-Scale Battery Energy Storage Systems
- This information must also be provided within the facility's Emergency Information Book.*

Model Requirements and BESS specific Requirements that call for an EMP (ERP) will be addressed by the development of an EMP (ERP) to be provided as a separate document.

Response

Item	To be provided yes/no or equivalent		
Model requirements – all facilities	An EMP (ERP) will be provided as a separate document during detailed design before development starts.		
Additional requirements – BESS Specific	a)	To be included in EMP (ERP).	
	b)	i.	To be included in EMP (ERP).
		ii.	
		iii.	
		v.	
	c)		
	d)	To be included in EMP (ERP).	
	e)		

7.2 Provision of Emergency Information

The requirements of the CFA Guidelines are not documented here as FRV GL-55 Guidelines provide a specific reference for the preparation of an Emergency Information Book:

Fire Rescue Victoria. (2021). Emergency Information Book. State of Victoria (Fire Rescue Victoria).
<https://www.frv.vic.gov.au/sites/default/files/2021-04/EIB%20Information.pdf> (FRV, 2025).

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8 References

CFA (2019) *CFA Guideline for the Provision of Emergency Information*. Country Fire Authority. Available at <<https://www.cfa.vic.gov.au/ArticleDocuments/409/EIB-GuidelinesV2.pdf.aspx?Embed=Y>>.

CFA (2023) *Design Guidelines and Model Requirements Renewable Energy Facilities v4.4 11/6/2025*. Country Fire Authority. Available at <<https://www.cfa.vic.gov.au/plan-prepare/building-planning-regulations/renewable-energy-fire-safety>>.

CFA (2025) *Fire Safety Studies for Battery Energy Storage Systems V1, June 2025*. Available at <<https://www.cfa.vic.gov.au/plan-prepare/building-planning-regulations/renewable-energy-fire-safety>>.

FRV (2025) Fire Rescue Victoria (FRV) publication *Battery Energy Storage Systems Guideline No. 55* (GL-55). Fire Rescue Victoria, Melbourne.

Fyfe (2026) *Site Development Plan Rev 2*. 20-03-2026. Client supplied.

Standards Australia (2020) *AS 3959:2018 Construction of buildings in bushfire-prone areas*. Incorporating amendment no.2, Standards Australia, North Sydney.

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9 Appendices

9.1 Appendix A – Access requirements

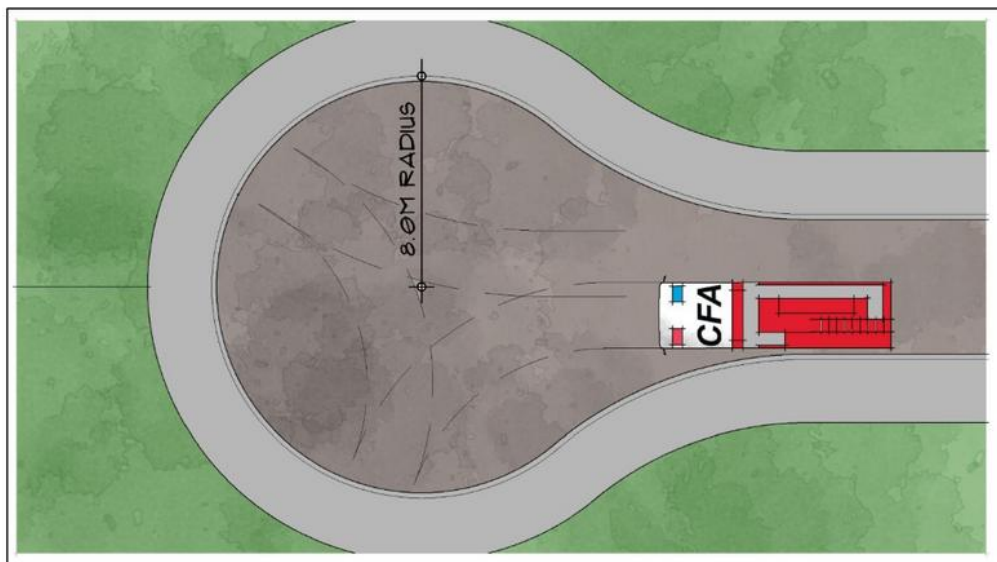


Image 1: Court-bowl style, minimum 8m radius (CFA, 2023).

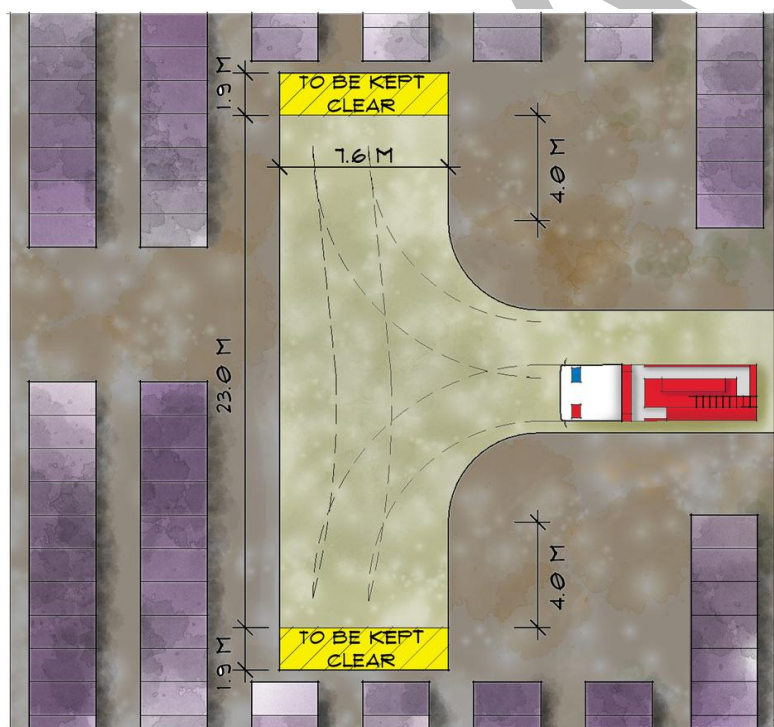


Image 2: 'T' head style (CFA, 2023).

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9.2 Appendix B – Water requirements



Image 1: 150 mm Full bore isolation valve (CFA, 2023).

Image 2: 125 mm, 100 mm, 90 mm, 75 mm and 65 mm Storz tree adapters (CFA, 2023).



Image 3: Fire water signage to comply with AS 2419.1 Section 5.4.5 (CFA, 2023).

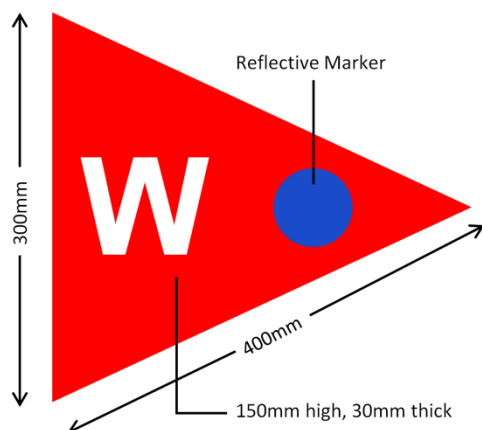


Image 4: Directional signage: fade resistant, fixed to rigid post in contrasting lettering, white sign writing on red background, with a circle reflective marker. 'W' in 150 mm upper case lettering (CFA, 2023).

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Image 5: Best-practice arrangement of fire service infrastructure for facilities with battery energy storage systems with reticulated water supply meeting the performance requirements of AS 2419.1-2021: Fire hydrant installations (CFA, 2023).

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Image 6: Best-practice arrangement of fire service infrastructure at facilities with battery energy storage systems without reticulated water supply, or a reticulated water supply that does not meet the performance requirements of AS 2419.1-2021: Fire hydrant installations (CFA, 2023).

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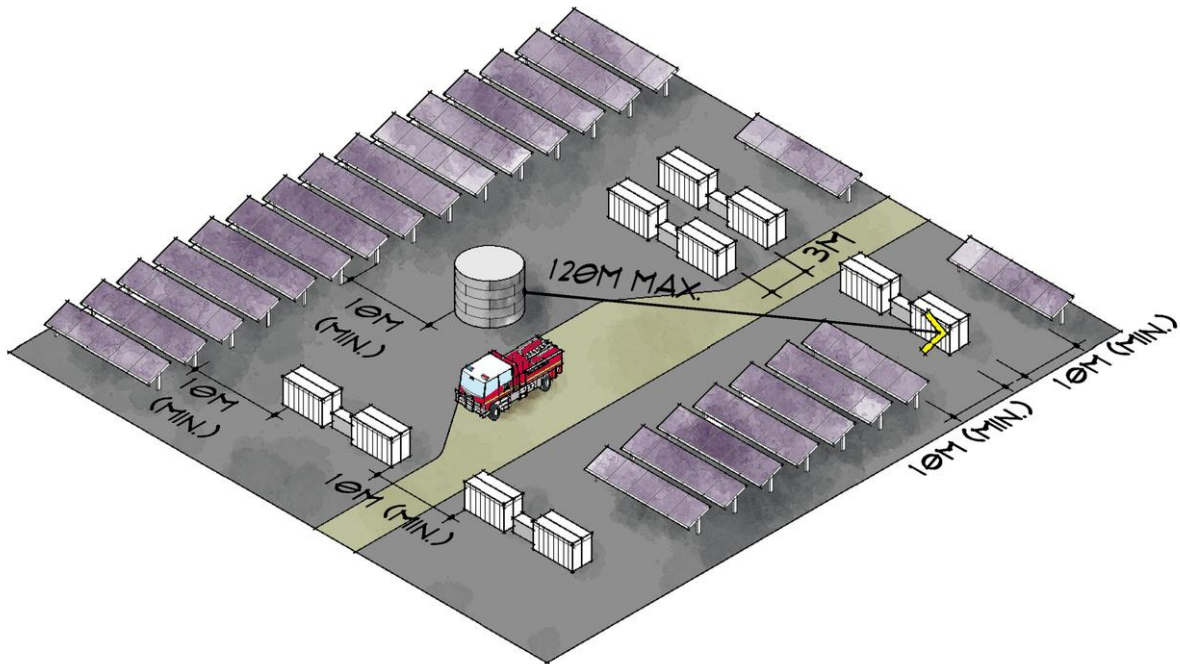


Image 7: Potential arrangement for fire water supply tank(s) for facilities with decentralised battery energy storage systems with no reticulated water supply to the site (CFA, 2023).

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