Steeple Renewables Project

Appendix 4.3: Outline Fire Risk Management Plan

Environmental Statement - Volume 2

March 2026

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The Infrastructure Planning (Examination Procedure) Rules 2010

Rule 8(1)(b)

Appendix 4.3: Outline Fire Risk Management Plan

Document Properties		
Prepared By	The Steeple Renewables Project Consultant Team	
Version History		
Version	**Date**	**Version Status**
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Examination Version	March 2026	Rev 4

Outline Fire Risk Management Plan

Steeple BESS

Ref	04954-9829732

Revision History

Issue	Date	Name	Latest changes
01	11/04/2025	[redacted]	First Created
02	18/12/2025	[redacted]	Updates in 3.3.6 and Appendix B (items 9 and 12) following feedback from the Environment Agency
03	04/03/2026	[redacted]	Updates in 3.3.1, 3.3.5 and 3.3.6 following feedback from the Environment Agency and the Fire & Rescue Service. Appendix B separated into standalone document 04954-13203596. Appendix C updated.
04	16/03/2026	[redacted]	Update in 3.3.6 to confirm refill of water tank prior to recommissioning of the site. Updates to align with 2025 NFCC guidance in 3.2, 3.3.1, 3.3.4 and new sections 3.4 and accompanying Appendix D.

Contents

1 Introduction

This document forms the Steeple BESS Outline Fire Risk Management Plan. The document indicates how the project has been developed to address fire risk in several ways. It contains key mitigation measures against the risk of fire ignition and propagation within the Battery Energy Storage System (BESS) site.

Fire safety of BESS is governed by regulation and international standards out with the planning system. While this report and its appendices do cover some of those standards, the focus of this report is on the location and design considerations as they are relevant for the planning application.

Battery technology and associated understanding of fire risk is continually evolving within the industry. As such, this document sets out key principles and mitigation measures based on the current understanding of battery fire risk but does not include a detailed Fire Risk Management Plan. A detailed Fire Risk Management Plan would be developed during detailed design, following battery selection.

2 Project Description

2.1 General Project Information

Renewable Energy Systems Ltd (RES) is developing a 150MW BESS facility near West Burton Substation as part of the Steeple Renewables project. The BESS will consist of Battery Storage Enclosures (BSEs), Power Conversion Systems (PCSs), transformers, electrical infrastructure, foundations, access track, crane hardstanding, and spares storage containers. The grid connection will be made via a 400kV substation that serves the wider Steeple Renewables project as well as the BESS facility.

2.2 Battery Selection

The proposed battery technology for the development is anticipated to be lithium iron phosphate (LFP). LFP has better thermal stability and enters thermal runaway at higher temperatures compared to some other battery chemistries. This is demonstrated by the UL 9540A test results of RES' preferred battery system which show that, at a unit level following deliberate initiation of thermal runaway:

- No flaming outside the initiating battery rack was observed.
- Surface temperatures of modules within the target battery rack adjacent to the initiating battery rack do not exceed the temperature at which thermally initiated cell venting occurs.
- Wall surface temperature rise does not exceed 97˚C above ambient.
- Explosion hazards were not observed during the test.

Data from UL9540A testing can also be used to inform detailed design of the site and safety systems.

Each BSE has an approximate footprint of 6.1 x 2.4m. The exact battery form factor and capacity will be determined during detail design phase and would be documented within the detailed Fire Risk Management Plan.

3 Design Factors

3.1 RES Internal BESS Safety Best Practice Principles

Based on available standards, construction and operation experience, RES has developed internal best practice to manage the safety of battery energy storage systems. A document summary of these principles can be found in Appendix A.

3.2 Fire Response Strategy

It is the intention that the site would be self-sufficient during a potential battery-based fire event and would not require fire service intervention to prevent fire spread or any other significant risks to people or property. Key principles of the NFCC Grid scale energy storage system planning – Guidance for fire and rescue services, 2025 (“the NFCC Guidance”) are addressed through the mitigations identified within this report, as these pertain to the fire risk management strategy set out below.

The overarching fire risk management strategy would adopt the following controls:

1. Implement measures that result in a very low risk of fire ignition and any suitable environment for sustaining fire.
2. Implement measures that result in a very low risk of fire propagation and spread within a fire source (e.g. BSE).
3. Ensure fire spread between significant elements of the project is not expected, through application of design standards and use of calculations / modelling as necessary.
4. Include adequate provisions to allow the fire service to monitor a fire event, intervening only if there is a failure of the controls above.

Due to the risks associated with lithium-ion fires, transformer fires, and high-power equipment, there are significant safety benefits to minimising fire service intervention and consequential firefighter hazard exposure.

During detailed design, following battery product selection this Outline Fire Risk Management Plan will be developed into a detailed plan, in liaison with the Fire Service and with due consideration of the NFCC Guidance. The detailed Fire Risk Management Plan will include:

- A fire risk appraisal that details how the fire response strategy above will be achieved, including the identification and design of any further mitigations required to achieve the strategy above.
- An emergency response plan.

3.3 Mitigation Measures

The following points define the key preliminary design mitigations against the risk of fire ignition and propagation within the BESS site. For a detailed assessment of how the layout meets the recommendations of current NFCC guidance, please refer to Appendix B.

3.3.1 Equipment spacing

The site has been developed to include adequate spacing between BSEs to mitigate against the risk of fire spread in the event of a fire within one BSE. The site layout aligns with applicable NFPA 855 spacing criteria as well as the spacing recommendations outlined in FM Global Property Loss Prevention Datasheet 5-33 (Interim revision April 2025).

The current layout is based on a minimum distance of 3m between battery enclosures side-to-side and 0.3m end-to-end. As per latest NFPA 855 guidance, a separation of less than 0.914m can be justified based on large-scale fire testing. Although a particular battery enclosure product hasn't been specified at this stage, there are several products currently on the market that have passed a large-scale fire test with BSEs being separated by 0.3m or less. Whichever product is specified during detailed design, it will have passed a large-scale fire test to inform and confirm the final spacing between BSEs.

3.3.2 Protection systems

Each BSE will have a dedicated fire protection system, comprising flammable gas detection and venting, fire detection and alarm, and an automatic fire suppression system. Additionally, key battery health and environment parameters will be continuously monitored with alarms sent to a control centre. Automatic electrical disconnection will be enacted by the battery management system should operational temperature, current or voltage limits be breached. There will be levels of alarms prior to protection limits which warn the operator of proximity to safe operating limits. BSEs will be fitted with deflagration venting and explosion protection appropriate to the hazard.

3.3.3 Access to battery storage enclosure

All BSEs will be accessed via external doors only, i.e. no internal corridor to eliminate the risk of people being inside an enclosure during a fire or thermal runaway gas venting incident.

3.3.4 Location of BESS facility

The location of the facility has been selected considering the distances from existing nearby premises. There are no premises nearby site, with the nearest one to site to be more than 350m in distance. A distance of at least 30m is achieved between BSEs and the Steeple Renewables project site boundary, and there are no existing or planned bushes or trees within 3m of any BSE.

3.3.5 Access for emergency services

Should the fire services need to attend the site, the fenced BESS compound has a wide access route through east corridor and through centre, allowing the fire service to access the site during an incident. In addition, two site access points are proposed to ensure that fire services have an alternative option for approaching site if the combination of wind direction and smoke makes one direction particularly onerous.

A wind frequency rose acquired by Global Wind Atlas website indicates that the prevailing wind direction for the area is from the southwest. Given the relative distances between the proposed BESS compound and the site entrances, as well as the prevailing wind direction, it is assessed as unlikely that both site access points will simultaneously experience obscuration due to adverse conditions at the same time. The wind rose is also shown in Appendix C.

Turning locations for emergency response vehicles are available within the site hardstandings and at the main entrance gates.

The proposed access tracks geometry has been designed to facilitate fire response vehicle access, with a minimum width of 4m, incorporating wider sections at bends. The tracks will be designed and constructed to provide a minimum carrying capacity of 12.5t per axle.

Environment Agency (EA) surface water flood mapping identifies areas of surface flood risk—defined as having a 1% annual probability of reaching a flood depth of 200 mm—within the eastern and southern sections of the BESS facility compound, as well as along parts of the access tracks. Two isolated areas of higher risk are also identified: one along the northern access track and another in the northeastern part of the compound, both with a 3.3% annual probability of reaching the same flood depth.

The preliminary design of the BESS facility incorporates a range of mitigation measures to address these risks. Surface water drainage infrastructure is included throughout the site, and earthworks will raise the finished compound level by a minimum of 200 mm above existing ground levels. Access tracks will be designed with a cross-fall to promote surface water runoff.

In the event of surface water flooding, a flood depth of 200 mm is not expected to compromise access to the site, including for emergency response vehicles. Furthermore, an alternative access route—located outside of identified flood risk zones—will be available to ensure uninterrupted access for fire and rescue services if required.

Local fire rescue services will be given the ability to gain access to the BESS compound even if the site is unmanned. Details of the access procedure will be developed as part of the detailed fire risk management plan, and will be included in the emergency response plan, but the procedure is anticipated to comprise the inputting of a key code.

3.3.6 Water supply

As outlined in Section 3.2, there are significant safety benefits to minimising fire service intervention during lithium-ion fires, transformer fires, and high-power equipment fires. Notwithstanding this, the need for fire service intervention cannot be ruled out; an on-site water supply will therefore be made accessible in line with current NFCC guidance.

Current NFCC guidance states a water supply of 1,500 litres per minute for a least two hours should be accessible on site, equating to a minimum volume of 180m^3. Whilst the final water supply solution will be determined through development of a detailed fire risk management plan, two solutions to comply with this guidance are identified in this preliminary assessment.

Utility records indicate the nearest public water mains to site are within North Street ~470m to the southwest, or Gainsborough Road ~860m to the northwest. A piped hydrant could be constructed on site that is served by one of these public mains. Should this option be found not to be viable during detailed assessment, fire water can instead be stored in tanks on site. Two spatial provisions for water tanks have been included in the preliminary BESS layout, both measuring 17m x 13m.

If onsite storage is opted for as the supply solution, a storage tank product will be specified during development of the detailed fire risk management plan. There are numerous tank products currently on the market that can store 180m^3 water whilst fitting within a 17m x 13m area.

Tanks would be filled with clean water from water tankers before site operation. In the event of a fire, the tanks would be refilled from water tankers once safe to do so following the event. Site operation will not recommence until the tanks have been refilled with 180m^3 of water.

The tank spatial provisions are located adjacent to tracks such that fire tender vehicles can easily extract water during a fire event, and a vehicular tanker can easily refill the tanks following an event.

The existing potential firefighting water sources and the provisioned water storage areas are identified in Appendix C.

3.4 Sensitive Receptors Assessment

Sensitive receptors within 1km of the site which could be affected by a fire have been assessed in Appendix D. This includes their identification on a plan in Appendix D1 and a risk assessment in Appendix D2. The following receptors were considered in the assessment:

- Schools, hospitals, nursing and care homes, residential areas, and workplaces.
- Protected habitats, watercourses, groundwater, boreholes, wells, and springs supplying water for human consumption.
- Roads, railways, bus stations, pylons (on or immediately adjacent to the site only), utilities, and airports.

4 Operational Factors

As well as mitigations to make the site inherently safer by design and the inclusion of active and passive controls, operational mitigations will be implemented to manage fire risk. This section states the operational factors which will be addressed in the detailed Fire Risk Management Plan.

4.1 Emergency Response Plan

The Emergency Response Plan will be developed in line with the detailed Fire Risk Management Plan. It will outline how the operator will respond to incident and accident scenarios on site including clear guidance for first responder organisations.

4.2 Hazard Identification and Mitigation Analysis

During detailed design, project and equipment specific hazards will be identified. Actions taken to mitigate those hazards will also be identified and residual risks will be communicated as part of the emergency response plan.

4.3 Hazardous Material

Any hazardous materials stored at the BESS facility will be fully justified and detailed in the emergency response plan. This will detail the location, description, quantity and appropriate precautions.

4.4 Safety Management Structure

The BESS safety management structure is yet to be fully defined but will include a formal top-down management structure that has the authority and responsibility to make decisions in design, procurement, construction and operation that places safety and environmental risk at forefront.

4.5 Staff Competence

The detailed Fire Risk Management Plan will ensure that all personnel who have responsibility for safety or activities which could impact the surrounding environment are competent to discharge those responsibilities.

5 Conclusion

During the preliminary design, efforts have been made to mitigate fire hazards on site by incorporating specific design factors as described in this Outline Fire Risk Management Plan.

During detailed design and following battery product selection, a detailed Fire Risk Management Plan will be developed. This will include a project specific fire risk appraisal, which will be used to verify and finalise the strategy presented in this document, and an emergency response plan, which will be developed through liaison with the local fire service.

Appendix A RES BESS safety best practice principles

RES BESS safety best practice principles

Author	[redacted]
Date	16/12/2024
Ref	ENG01-9033728

Revision History

Issue	Date	Name	Latest changes
01	06 December 2024	[redacted]	First created
02	12 December 2024		Correction to title block date quick part

Contents

1 Introduction

This document sets out RES internal best practice for risk mitigation in BESS design.

Based on available standards, construction and operation experience, RES has developed internal best practice to manage the safety of battery energy storage systems.

It is important to be aware of hazards general to the power industry *and* specific to battery energy storage systems.
The key hazards for battery storage projects are:

- Thermal runaway - caused by mechanical or electrical abuse, or internal faults such as lithium plating of cells, resulting in spontaneous internal short circuits.
- High DC fault currents - Short circuit currents from banks of batteries can be in the range of 100kA – 150kA or more.
- Live working - The source of charge of a battery can never be completely isolated.

It is equally important to understand that these inherent hazards can all be controlled through appropriate design and operation procedures and RES is actively collaborating with both BSI/IEC and EPRI in the development of standards and best practice guidance.

2 Hazard mitigation analysis, risk mitigation & layers of protection

During detailed design RES projects undergo Hazard Mitigation Analysis (HMA), like Failure Mode and Effects Analysis or HazID, HazOP and LOPA) to identify hazards, and improve design to reduce risk.

2.1 Substitution

Lithium-ion batteries have a number of different potential chemical make ups – some of which are listed below:

- NMC – lithium nickel manganese cobalt
- NCA – lithium nickel cobalt aluminium
- LFP – lithium iron phosphate
- LMO – Lithium manganese spinel
- LTO – lithium titanate

Each chemistry has different effects on characteristics of the cell like cost, energy density, cycling life, thermal stability and specific power. NMC and LFP are the most common chemistries for stationary energy storage and while both have intrinsic hazards it is easier to make LFP cells safer as:

- They have greater thermal stability, going into thermal runaway at higher temperatures
- Produce less oxygen during electrolyte breakdown, reducing the risk of combustion

Following the hierarchy of control RES substitutes less thermally stable li-ion chemistries like NMC, for the more thermally stable LFP

2.2 Engineering controls

Design methods to address these hazards identified by the HMA can include:

- Protection and control layers through the system, rack and module Battery Management Systems and rack level contactors and fusing.
- Coordination of DC protection between the batteries and PCS including appropriate insulation monitoring and arc-flash assessment
- Ingress Protection rating to match the local installation environment
- Site design to mitigate any external hazards (i.e. vehicle collision, lightning strike, rodent damage)
- NFPA 855 and IEC 62933 safety design standards in conjunction with UL9540A test methods and results should be followed to design storage systems to mitigate effects of fire and explosion.
- Explosion prevention and control (such as active deflagration prevention control or passive deflagration venting), used as an additional measure to mitigate effects of explosive atmospheres in battery containers.

The design of RES' BESS adopt the following layers of protection against failure as standard, to reduce the risk of hazards impacting people and environment:

- Module level monitoring of voltage and temperature via a local battery management system (BMS).
- A secondary BMS at the rack/string level to monitor module operation and allow automatic disconnection of electrical contacts.
- Monitoring of battery storage enclosure environment and/or cell temperature ensuring system stability using RES' proprietary Energy Management System, RESolve.
- A flammable gas detection system capable of warning of an explosive atmosphere present in the system and activating forced ventilation.

In the event these layers of protection fail, fire suppression can reduce the impact of those failures. Design should be informed by Fire Risk Assessment and can include:

- A fire detection system equipped with smoke and heat detectors able to rapidly alert system operators.
- A fire suppression system capable of mitigating fires in the unit not caused by thermal run-away (note: oxygen is not required for thermal run-away to propagate)
- A system to allow application of water in the event of a thermal run-away event to help absorb the heat generated, such as dry type sprinkler systems. Though there are risks associated with fire service intervention in a fire due to the chemicals produced and water may be best used to further reduce the risk of propagation outside of the initiating enclosure.
- Deflagration venting in the form of blast panels to mitigate the effects of an explosion should an explosive atmosphere form.

All of the above conform with NFPA 855 and IEC 62933 safety design standards informed by UL9540A test data to ensure the site is designed appropriately to mitigate effects of fire.

2.3 Administrative controls

It is important to have robust operating procedures and to engage with the local emergency services to ensure that they are aware of the hazards, and the protection and control features of the BESS. RES projects development includes:

- Ensuring appropriate signage as per NFPA 855, which includes but is not limited to:
  - Energy storage system identification sign, including type of technology, any special hazards, emergency contact information and suppression system type installed.
  - Location of all electrical power disconnectors.
- Hosting regular site visits by local emergency services to familiarise themselves with the installation.
- A premises information box positioned at a safe distance from the energy storage location and should contain the following information:

    - Plans of the site.
    - Description of the site and buildings.
    - Information regarding the use of the site and significant risks.
    - Details of key personnel and emergency contact details.
    - Evacuation strategy within the local area.
    - Construction and layout including emergency access points and isolation systems.
    - Details of fire safety systems, alarms and suppression systems.
- An Emergency Response Plan developed with the local Emergency Responders including clear instruction that Emergency responders should not enter or open containers once alight.

Appendix B Project Specific NFCC Recommendations Assessment

Project Specific NFCC Recommendations Assessment

Steeple BESS

Ref	04954-13271961

Revision History

Issue	Date	Name	Latest changes
01	17/03/2026	[redacted]	Appendix B content separated from 04954-9829732 into this document and updated to align with 2025 NFCC guidance

NFCC Recommendations Project Specific Assessment

This document assesses the project specific layout against the 2025 National Fire Chief's Council (NFCC) guidance on grid scale energy storage system planning.

2025 NFCC Guidance Recommendation	NFCC Section Reference	Design factors / mitigations
NA	1-5, 7, 20	No specific design recommendation has been identified in these sections. However, when designing risk mitigations, the project will follow the principle of as low as reasonably practicable (ALARP), and the project will proactively engage with the local fire service throughout the development and operational phase.
Provide information on system design, construction, testing and decommissioning	6	Specific information will be available at detailed design stage.
Provision of detection and monitoring	8	Appropriate automatic detection and continuous combustible gas monitoring will be provided in all battery storage enclosures (BSE). Temperature detection via the BMS will be provided in all BSEs and protection will be in place to disconnect affected batteries automatically. External audible and visual warnings will be available at all BSEs to operational crews. Specific details of these systems will be provided during detailed design.
Provision of suppression systems	9	Sufficient controls will be in place to prevent a fire or other thermal event in the BSE of origin, from propagating to adjacent equipment. This will primarily be achieved by spacing enclosures in line with technical evidence including fire testing. Further details including reports such as UL9540A will be provided during detailed design once equipment has been selected.

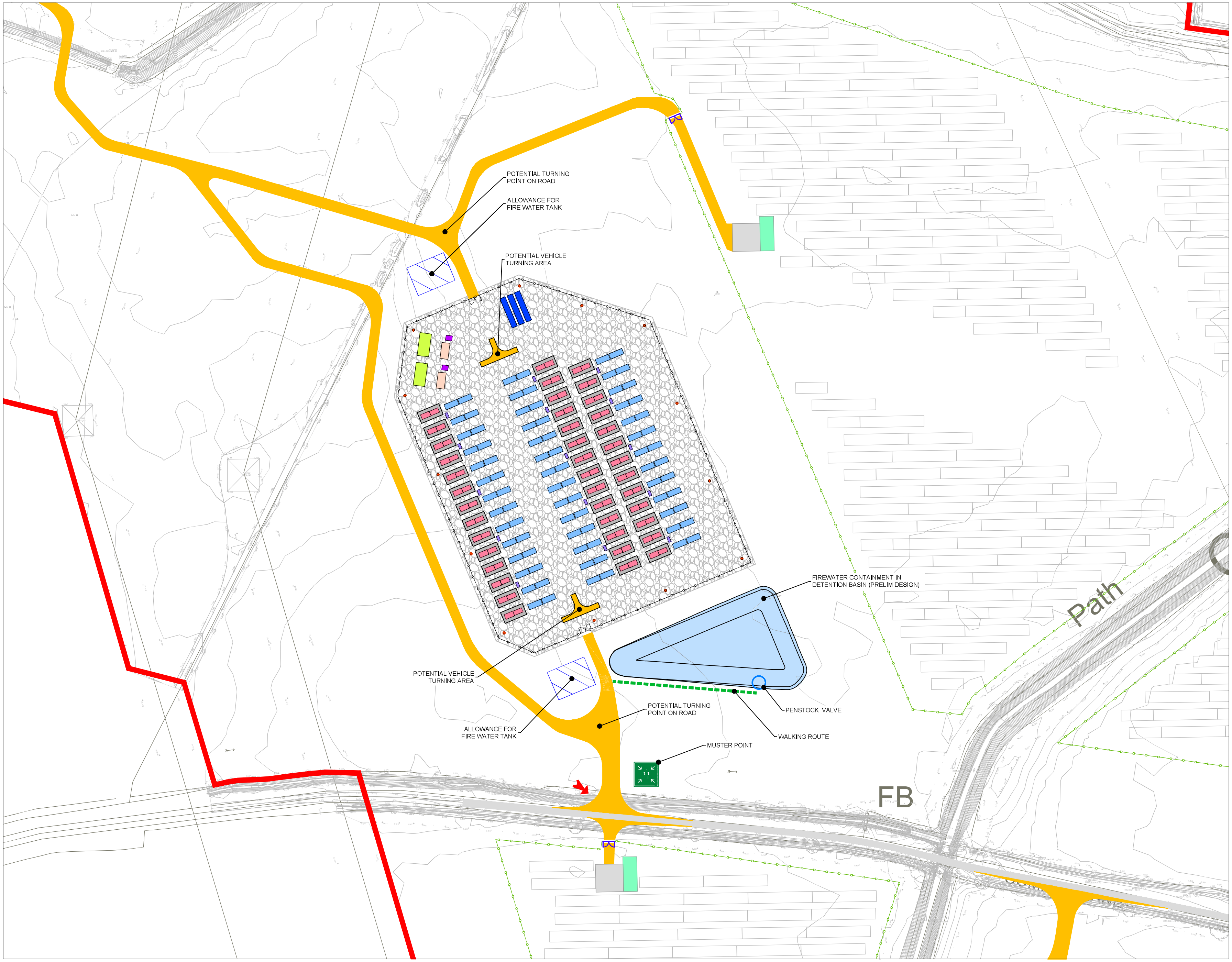
		Additionally, each BSE will have a dedicated fire protection system including fire detection and alarm, and an automatic fire suppression system.
Provision of explosion control	10	Specific details of explosion control systems will be available at detailed design stage. Each BSE will be fitted with deflagration venting and have a dedicated explosion protection system including flammable gas detection and venting in line with NFPA69. A sensitive receptors plan and accompanying risk assessment is provided in Appendix D to assess the impact of a potential incident on the surrounding area.
Access - Minimum of two separate access points to the site	11	The site benefits from two distinct access points connected to Gainsborough Road and Common Lane. The primary site access is located approximately 740 meters west of the proposed BESS compound, while the secondary access is situated approximately 80 meters south of the compound. A wind frequency rose acquired by Global Wind Atlas website presented in Appendix C, indicates that the prevailing wind direction for the area is from the southwest. Given the relative distances between the proposed BESS compound and the site access points, as well as the prevailing wind direction, it is unlikely that both site access points would simultaneously experience obscuration due to adverse conditions at the same time.
Roads/hard standing capable of accommodating fire service vehicles in all weather conditions. As such there should be not extreme grades.	11	The proposed access track and BESS internal compound access corridor geometry and gradients have been designed to facilitate fire response vehicle access, with a minimum width of 4m, incorporating wider sections at bends. The tracks will be designed and constructed to provide a minimum carrying capacity of 12.5t per axle. The proposed access tracks will be designed and constructed in line with appropriate industry guidance and in agreement with the fire and risk services to ensure an appropriate surface and gradient for the intended use.
A perimeter road with passing place suitable for service vehicles	11	The BESS compound layout allows circular routes including internal compound hardstandings and the access track on the west. The routes run around the compound and between electrical equipment allowing access to all BESS units as indicated in Appendix C. There is adequate space within the BESS compound for vehicles to pass.
Access tracks and BESS internal compound	11	The BESS internal compound corridors run around the BESS units, thus allowing access to all BESS units.

corridors must enable unobstructed access to all areas of the facility		The site meets requirements of Building Regulations Approved Document B Vol 2 allowing all points on site to be within 45m of a fire appliance when required.
Turning circles, passing places etc. size to be advised by FRS depending on fleet	11	The BESS internal compound corridors allow access to all BESS units (see Appendix C) in two different directions and allow for FRS vehicles to drive in and drive out without need to reverse. In case that the FRS need to manoeuvre, the layout has allowed several turning points, which achieve the minimum width and bend radius outlined in Building Regulations Approved Document B Vol 2 Table 15.2.
Distances from BESS units to occupied buildings and site boundaries.	12	There are no premises within 30m of BESS units and is a rural area, the nearest residential dwelling is more than 350m away from the compound edge. The site boundary is minimum 150m distance from BESS units.
Access between BESS units - minimum of 0.914m suggested. Further reductions in distances should only be made based on technical evidence from a competent person.	12	The current layout is based on a minimum distance of 3m between battery enclosures side-to-side and 0.3m end-to-end. As per NFPA 855 2026 guidance, a separation of less than 0.9m can be justified based on large-scale fire testing. Although a particular battery enclosure product hasn't been specified at this stage, there are several products currently on the market that have passed a large-scale fire test with BSEs being separated by 0.3m or less. Whichever product is specified during detailed design, it will have passed a large-scale fire test to inform and confirm the final spacing between BSEs.
Areas within 3m of BESS units to be cleared of combustible vegetation	13	There is no vegetation existing or proposed in the design within 3m of BESS units.
Water supply	14	An on-site water supply will be made accessible in line with current NFCC guidance. Current NFCC guidance states a water supply of 1,500 litres per minute for a least two hours should be accessible on site, equating to a minimum volume of $180m^3$. A piped hydrant could be constructed on site that is served by a nearby public mains. Should this option be found not to be viable during detailed assessment, the fire water can instead be stored in tanks on site. Two spatial provisions for water tanks have been included in the preliminary BESS

		layout, both measuring 17m x 13m. There are numerous tank products currently on the market that are capable of storing $180m^3$ whilst fitting within a 17m x 13m area. Tanks would be filled with clean water from water tankers before site operation. In the event of a fire, the tanks would be refilled from water tankers once safe to do so following the event. Site operation will not recommence until the tanks have been refilled with $180m^3$ of water. The existing potential firefighting water sources and the provisioned water storage areas are identified in Appendix C.
Signage	15	Signage will be positioned at the entrance to the Site, including a site layout plan and details of the key personnel. Guidance notes that adherence to the dangerous substances (Notification and marking of Sites) Regulations 1990 (NAMOS) should be considered where the total quantity of dangerous substances exceeds 25 tonnes. It is understood that lithium-ion batteries are Class 9 dangerous goods under the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) which is applicable under NAMOS via Carriage of Dangerous Goods (CDG). NAMOS will be adhered to, and the emergency response plan will detail the location, description and quantity of dangerous goods and appropriate precautions for dealing with them.
Outline battery safety management plan	16	A detailed fire risk management plan and an emergency response plan will be developed and shared following detailed design. These documents will cover all requirements of the outline battery safety management plan.
Identify sensitive receptors within 1km radius	17	A sensitive receptors plan and accompanying risk assessment has been developed and can be found in Appendix D.
Containing and managing fire water run off	18	The use of water in the firefighting process risks mobilising combustion contaminants. The surface water drainage infrastructure proposed for site has been designed to contain such contaminated firefighting water runoff, preventing it from entering any existing above and below-

		ground water sources. The contained firefighting runoff can be pumped out into a tanker and disposed of safely off-site. The preliminary firefighting runoff containment design is detailed in Appendix 8.2 of the project Surface Water Drainage Strategy (doc ref EN010163/APP/6.3.8).
Flood protection or mitigation	18	Environment Agency (EA) surface water flood mapping identifies areas of surface flood risk—defined as having a 1% annual probability of reaching a flood depth of 200 mm—within the eastern and southern sections of the BESS facility compound, as well as along parts of the access tracks. Two isolated areas of higher risk are also identified: one along the northern access track and another in the northeastern part of the compound, both with a 3.3% annual probability of reaching the same flood depth. The preliminary design of the BESS facility incorporates a range of mitigation measures to address these risks. Surface water drainage infrastructure is included throughout the site, and earthworks will raise the finished compound level by a minimum of 200 mm above existing ground levels. Access tracks will be designed with a cross-fall to promote surface water runoff. In the event of surface water flooding, a flood depth of 200 mm is not expected to compromise access to the site, including for emergency response vehicles. Furthermore, an alternative access route - located outside of identified flood risk zones - will be available to ensure uninterrupted access for fire and rescue services if required.
Recovery	19	The project will develop a post-incident recovery plan that addresses the potential for re-ignition of BESS and de-energising the system. The plan will also include provisions for removal and disposal of damaged equipment and contaminated fire water effluent. Unless otherwise required these details will be included in the emergency response plan following detailed design.

Appendix C Outline Fire Risk Management Layout



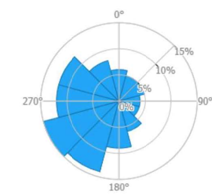
KEY (BESS LAYOUT):

- ORDER LIMIT (OUTSIDE EDGE OF LINE DENOTES BOUNDARY)
- PALISADE / WELDMESH OR ACOUSTIC FENCE
- BATTERY STORAGE ENCLOSURE (BSE)
- POWER CONVERSION SYSTEM (PCS) WITH SINGLE MV SKID AND APRON SLAB
- BESS SUBSTATION BUILDING
- AUXILIARY TRANSFORMER
- LV SWTICHGEAR ROOM
- AGGREGATION PANEL WITH LV PILLAR
- SPARES CONTAINER
- LIGHTING / CCTV COLUMN
- GRAVEL FINISH
- ACCESS TRACK
- SITE ENTRANCE

KEY (SOLAR LAYOUT):

- HARDSTAND
- INVERTER AREA
- SUBSTATION
- FENCE
- SOLAR PANELS
- GATE

SITE WIND FREQUENCY ROSE



NOTES:

1. EQUIPMENT DETAILS, CONFIGURATION AND DIMENSIONS WITHIN BATTERY STORAGE COMPOUND ARE INDICATIVE AND SUBJECT TO PRELIMINARY DESIGN.

0 5 10 20 30 40m
SCALE 1:500

SHEET 1 OF 2

ISSUE	DRAWN	CHKD	APPD	DATE	REVISION NOTES
4	BM	DC	CH	2026-03-03	Updated existing water infrastructure
3	BM	DC	CH	2025-12-19	General Amendments
2	FG	AP	CH	2025-05-02	Scale bar added
1	AL	AP	CH	2025-04-11	First Issue

PURPOSE: PRELIMINARY	COORDINATES: OSGB 1936
SCALE: 1:500 @ A1	DATUM: N/A
LAYOUT DWG: N/A	T-LAYOUT NO.: N/A

PROJECT TITLE
STEEPLE RENEWABLES PROJECT
EN010163

DRAWING TITLE
2.25 - OUTLINE FIRE RISK MANAGEMENT LAYOUT
APFP REG 5(2)(O)

RES DRAWING NUMBER	REV
04954-RES-LAY-DR-PE-012	4

BEAUFORT COURT,
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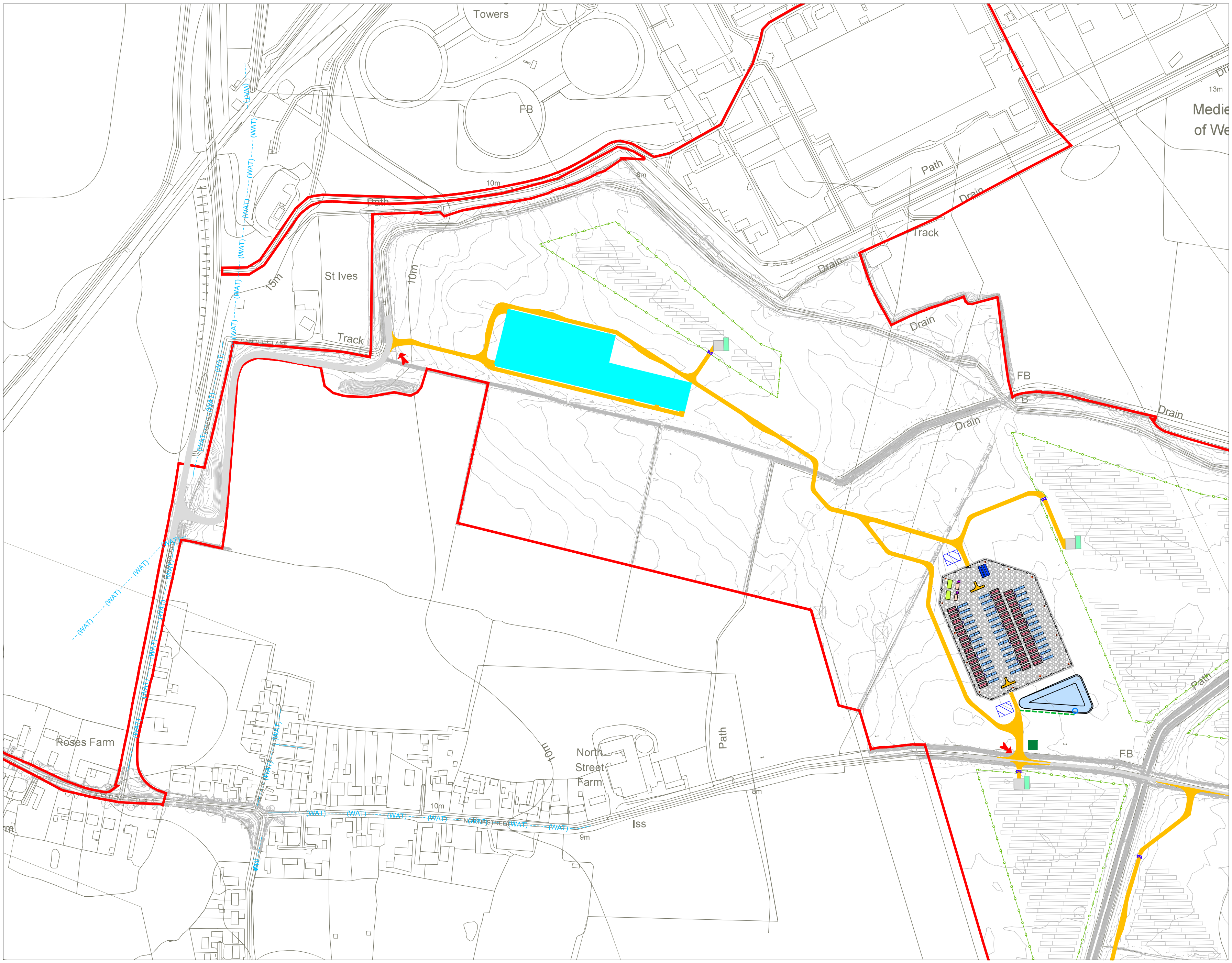


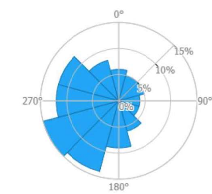
KEY (BESS LAYOUT):

- ORDER LIMIT (OUTSIDE EDGE OF LINE DENOTES BOUNDARY)
- PALISADE / WELDMESH OR ACOUSTIC FENCE
- BATTERY STORAGE ENCLOSURE (BSE)
- POWER CONVERSION SYSTEM (PCS) WITH SINGLE MV SKID AND APRON SLAB
- BESS SUBSTATION BUILDING
- AUXILIARY TRANSFORMER
- LV SWTICHGEAR ROOM
- AGGREGATION PANEL WITH LV PILLAR
- SPARES CONTAINER
- LIGHTING / CCTV COLUMN
- GRAVEL FINISH
- ACCESS TRACK
- SITE ENTRANCE
- (WAT) WATER MAINS (ANGLIAN WATER RECORD)

KEY (SOLAR LAYOUT):

- HARDSTAND
- INVERTER AREA
- SUBSTATION
- FENCE
- SOLAR PANELS
- GATE

SITE WIND FREQUENCY ROSE



NOTES:

1. EQUIPMENT DETAILS, CONFIGURATION AND DIMENSIONS WITHIN BATTERY STORAGE COMPOUND ARE INDICATIVE AND SUBJECT TO PRELIMINARY DESIGN.

0 20 40 60 80 100m
SCALE 1:2,000

SHEET 2 OF 2

ISSUE	DRAWN	CHKD	APPD	DATE	REVISION NOTES
4	BM	DC	CH	2026-03-03	Updated existing water infrastructure
3	BM	DC	CH	2025-12-19	General Amendments
2	FG	AP	CH	2025-05-02	Scale bar added
1	AL	AP	CH	2025-04-11	First Issue

PURPOSE: PRELIMINARY	COORDINATES: OSGB 1936
SCALE: 1:2,000 @ A1	DATUM: N/A
LAYOUT DWG: N/A	T-LAYOUT NO.: N/A

PROJECT TITLE
STEEPLE RENEWABLES PROJECT
EN010163

DRAWING TITLE
2.25 - OUTLINE FIRE RISK
MANAGEMENT LAYOUT
APFP REG 5(2)(O)

RES DRAWING NUMBER: 04954-RES-LAY-DR-PE-012 | REV: 4

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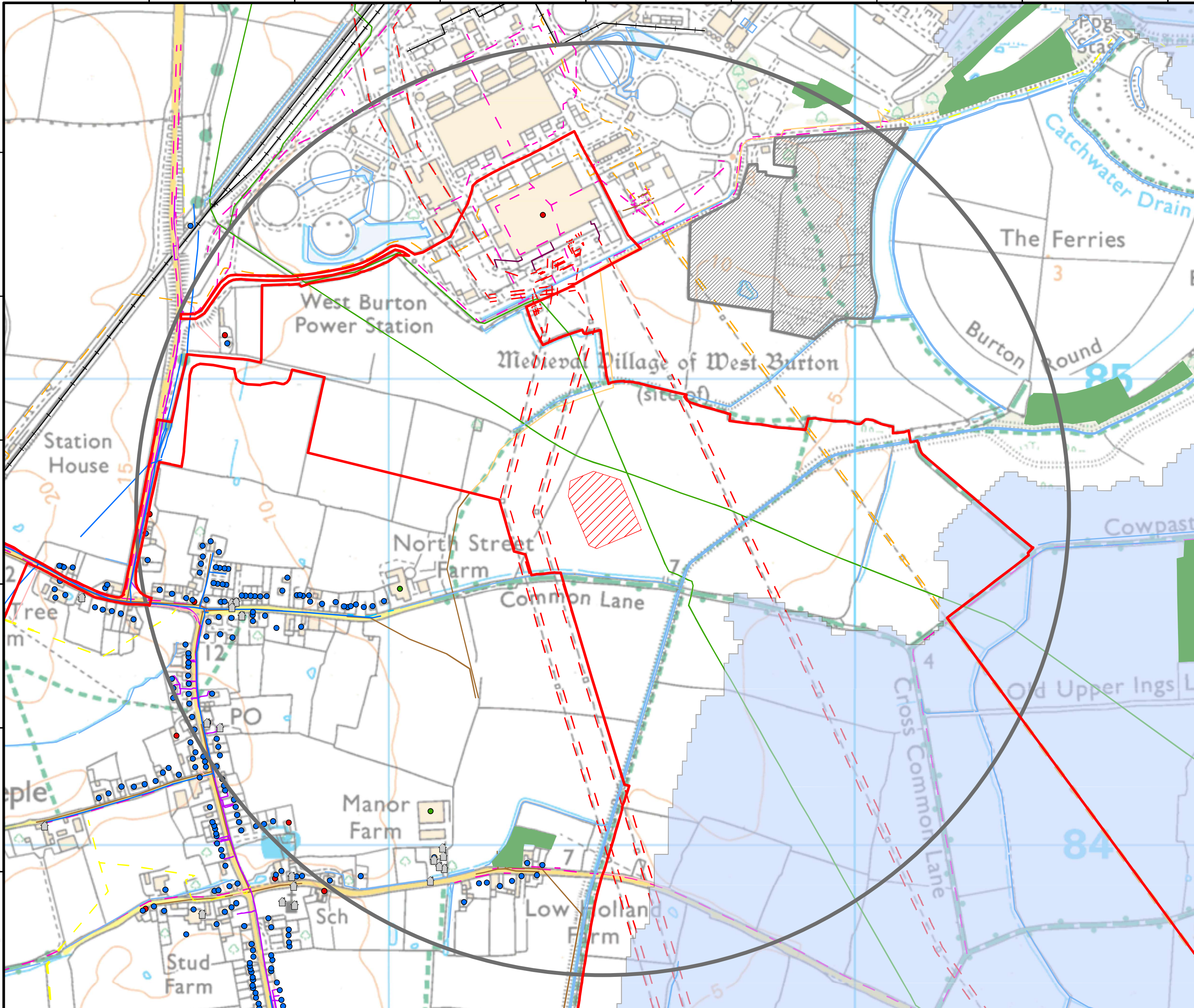
Appendix D Sensitive Receptors Assessment



STEEPLE BATTERY ENERGY STORGAE PROJECT

FIRE RISK SENSITIVE RECEPTORS WITHIN 1KM OF DEVELOPMENT

- Order Limits
- BESS
- BESS 1km Buffer
- LV
- HV 11kV
- HV 132kV
- HV 400kV
- Oil Pipeline
- Mains Gas
- Telecom
- Fiber
- Mains Water
- Foul Rising Main
- Foul water
- Surface Water
- Rivers & Lakes
- Drinking Water Protected Area
- Listed Building
- Scheduled Monument
- National Forest Inventory
- Public Road
- Public Right of Way
- Railway
- Properties
  - Commercial
  - Residential
  - Agricultural

SITE WIND FREQUENCY ROSE

LAYOUT	T-LAYOUT NO.
N/A	N/A

DRAWING NUMBER
04954-RES-MAP-DR-PT-001

SCALE - 1:8,000 @A3

ENVIRONMENTAL STATEMENT & PLANNING APPLICATION 2026

STEEPLE BESS SENSITIVE RECEPTORS DESIGN RISK ASSESSMENT

Purpose: Preliminary design for planning application.

Scope: This design risk assessment covers the sensitive receptors as defined in the 2025 version of NFCC's guidance (NFCC 2025). It considers potential incidents which could introduce hazards to these receptors, mitigations in place and residual risks for further assessment during detailed design.

Risk Assessment

Item #	Sensitive receptor	Category	Hazard	Severity	Likelihood	Risk	Mitigating factors	Severity	Likelihood	Risk	Residual Risk
1.	Residential area	People	Residents exposed to Hydrogen Fluoride (HF) toxic cloud during fire event	High	Likely	High	No residential premises have been identified within 350m of a battery storage enclosure. A preliminary HF toxic cloud assessment has been made based on a representative assessment by HSENI (Atkins 2021). It is anticipated that the risk at any nearby residential premise can be reduced to as low as reasonably practicable (ALARP) during detailed design.	Medium	Likely	Medium	Potential medium severity risk to residents. A project specific assessment will be made as part of hazard identification and mitigation analysis during detailed design.
2.	Residential area	People	Residents exposed to blast overpressure during a deflagration event	High	Likely	High	No residential premises identified within 350m of a battery storage enclosure. A preliminary overpressure assessment has been made based on a representative assessment by HSENI	Medium	Likely	Medium	Potential medium severity blast over pressure risk to residents. A project specific assessment will be made as part

							(Atkins 2021). It is anticipated that the risk at any nearby residential premise can be reduced to as low as reasonably practicable (ALARP) during detailed design.				of hazard identification and mitigation analysis during detailed design.
3.	Pylons and telecoms masts	Infrastructure	Pylons and overhead lines exposed to heat from fire	Medium	Likely	Medium	No pylons, overhead lines or telecoms masts identified directly above battery storage enclosures. More than 60m to the nearest overhead line or pylon and prevailing wind shown in the sensitive receptors plan reduces risk of plume being directed toward overhead lines or pylons.	Low	Likely	Low	Potential low severity risk of pylon or overhead line damage. If required, risk could be assessed through further hazard mitigation analysis techniques.
4.	Pylons and telecoms masts	Infrastructure	Pylons and overhead lines exposed to smoke plume reducing insulating properties of air	Medium	Likely	Medium	No pylons, overhead lines or telecoms masts identified directly above battery storage enclosures. More than 60m to the nearest overhead line or pylon and prevailing wind shown in the sensitive receptors plan reduces risk of plume being directed toward	Low	Likely	Low	Potential low severity risk of insulation reduction at pylons or between overhead lines. If required, risks could be assessed through further hazard mitigation

							overhead lines or pylons.				analysis techniques.
5.	Roads	People	Road users exposed to Hydrogen Fluoride toxic cloud during fire event	High	Likely	High	No roads identified within 80m of a battery storage enclosure. A preliminary HF toxic cloud assessment has been made based on a representative assessment by HSENI (Atkins 2021). It is anticipated that the risk at any nearby roads can be reduced to as low as reasonably practicable (ALARP) during detailed design.	Medium	Likely	Medium	Potential medium level toxicity risk to road users. A project specific assessment will be made as part of hazard identification and mitigation analysis during detailed design.
6.	Roads	People	Road users exposed to blast overpressure during a deflagration event	High	Likely	High	No roads identified within 80m of a battery storage enclosure. A preliminary overpressure assessment has been made based on a representative assessment by HSENI (Atkins 2021). It is anticipated that the risk at any nearby roads can be reduced to as low as reasonably practicable (ALARP) during detailed design.	Medium	Likely	Medium	Potential Medium. severity risk of blast overpressure to road users. A project specific assessment will be made as part of hazard identification and mitigation analysis during detailed design.
7.	Roads	People	Road traffic exposed to	Medium	Likely	Medium	Prevailing wind direction shown in the sensitive	Low	Likely	Low	Low severity risk of road

			smoke from battery fire				receptors plan is SW, which would blow smoke away from existing roads. No roads identified within 80m of nearest battery enclosure - at this distance hot smoke plume rise (Gexcon 2024) will likely mitigate the risk of smoke exposure at ground level even in the worst-case wind direction.				traffic being exposed to smoke from battery fire. If required risk could be assessed through further hazard mitigation analysis techniques such as plume modelling
8.	Water courses and ground water wells and springs	Environment	Water exposed to combustion contaminants as a result of a battery fire	Medium	Likely	Medium	A firefighting water containment strategy is incorporated into the site’s drainage design. The underside of the BESS compound gravel and the BESS compound attenuation basin will be lined with an impermeable geo-synthetic membrane. A penstock valve will be installed in a manhole between the basin and the site outfall.	Low	Likely	Low	Further assessment could be performed if recommended by the fire service.
9.	Oil and gas pipeline infrastructure	Infrastructure	Pipeline exposed to overpressure or acceleration during a	Medium	Likely	Medium	Oil and gas pipelines have been identified within 1km of site. Pipelines are buried so air pressure unlikely to cause significant risk.	Medium	Likely	Medium	Medium risk of oil and gas infrastructure being exposed to overpressure. A project

			deflagration event				Ground vibrations caused by the overpressure may cause risk to underground infrastructure.				specific assessment will be made as part of hazard identification and mitigation analysis during detailed design.
10.	Foul water infrastructure	Infrastructure	Pipes exposed to overpressure or acceleration during a deflagration event	Medium	Likely	Medium	Foul water pipes have been identified within 1km of site. Pipelines are buried so air pressure unlikely to cause significant risk. Ground vibrations caused by the overpressure may cause risk to underground infrastructure, but risk to foul water not expected to be significant since greater than 100m distance between battery storage enclosure and pipes.	Low	Likely	Low	Further assessment could be performed if recommended by the fire service.

References

NFCC 2025: Grid Scale energy storage system planning – Guidance for fire and rescue services, NFCC, December 2025

Atkins 2021: Hazard Assessment of Battery Energy Storage Systems, Atkins, Ian Lanes, Issue 01, March 2021

Gexcon 2024: Rising smoke plume phenomena, Gexcon, August 2024

Risk Matrix

Very Likely	Acceptable Risk (Medium)	Unacceptable Risk (High)	Unacceptable Risk (Very High)
Likely	Acceptable Risk (Low)	Acceptable Risk (Medium)	Unacceptable Risk (High)
Unlikely	Acceptable Risk (Low)	Acceptable Risk (Low)	Acceptable Risk (Medium)
Occurrence/Impact	Low	Medium	High