



POSITION STATEMENT SUMMARY

Electric vehicles (EV) and EV charging equipment

Position

Effective 4 June 2024, the following is a position of Fire and Rescue NSW (FRNSW):

FRNSW endorse the position on *Electric Vehicles (EV) and EV charging equipment in the built environment* as published by the Australasian Fire and Emergency Service Authorities Council (AFAC), as the appropriate guidance to practitioners who design and certify any Class 2-9 building that incorporates EV parking and/or charging.

FRNSW consider EVs and EV charging stations to be special hazards under E1D17 and E2D21 of the *National Construction Code (NCC) 2022*. As such, the certifier should identify what additional provisions are being provided, if any, and whether the fire safety measures in the building are commensurate to the hazards and risk(s) associated with the proposed EV parking and/or charging, when certifying any related building application.

Note: FRNSW considers incidents involving electric vehicles (EVs) and EV infrastructure to currently be low frequency, but potentially high consequence, incidents that require enhanced fire safety measures in place to facilitate safe and effective fire brigade operations.

FRNSW consider that all aspects of the AFAC Position should be considered and addressed. In conjunction with the AFAC position, FRNSW recommend that EV parking and/or charging be:

- located externally or in open air where possible.
- if located internal to a building, the carparking area should:
 - be protected by an automatic fire sprinkler system with a performance equivalent to a system complying with AS 2118.1 or AS 2118.6; and
 - not apply concessions to fire resistance levels (FRLs) that may be provided within the NCC deemed-to-satisfy provisions.
- protected by fire hydrant coverage.

Any request for consultation or referral to FRNSW relating to any building that intends to incorporate EV parking and/or charging, should adequately identify the hazards and risks and demonstrate how they are being addressed within the design. The 'recognised person' should address the special hazards and how the provisions of this position statement and the AFAC Position have been considered and addressed.

Note: A 'recognised person' means a person who is both an accredited practitioner (fire safety) and a fire safety engineer under the *Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021*.

Reference must be made to the FRNSW website to ensure this position is current at the time of use, and this position has not been superseded or revoked.

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Summary

This position statement supersedes the previous position last updated on 29 April 2024.

This position statement is based on FRNSW review of literature found to-date on the risks of EVs and EV charging. Whilst the incident rate may currently be low, the potential consequences when the lithium-ion battery pack of an EV is involved in a fire, whether or not the fire originated from it, are not fully understood and present a different challenge to fire fighters, occupant life safety, building integrity and environmental impacts when compared to an internal combustion engine vehicle (ICEV).

Some of the differences that need to be accounted for include; the potential for a rapidly developing fire, jet like flames, longer burn times and the potential for vapour cloud explosions. The failure of lithium-ion batteries during a fire is unique and differs from the typical combustion process of other combustible materials, and this difference also needs to be better understood and considered. The research and testing undertaken on EVs is considered to be quite limited and FRNSW consider that there are still considerable knowledge gaps.

It is evident from incidents that involve lithium-ion batteries that the managing of these incidents can be protracted, and there is also the potential for secondary ignition of battery cells even after initial extinguishment actions.

This position statement directs building proponents to the AFAC position as appropriate guidance in the design and certification of buildings that intend to incorporate EV parking and/or EV charging equipment.

This position reiterates the AFAC position that surveyors and certifiers implement Clause E1D17 and Clause E2D21 of the NCC, in relation to special hazards, when assessing building applications. A failure event within an EV battery (such as mechanical, thermal abuse, rapid discharge, or internal cell failure) has the potential to lead to a thermal runaway event within the EV battery, which may pose significant challenges for the building structure, the building occupants and for firefighters in the management of the incident.

The position directs building proponents to address design considerations from the AFAC position, including active fire safety systems such as an appropriate automatic fire sprinkler system, and suitable fire resistance levels. This is largely based on the concerns raised above with regards to the limited testing and understanding of the consequences of fires involving EVs.

When requesting consultation with, or a referral to, FRNSW for any building incorporating EV parking and/or charging, the position requires a 'recognised person' to:

- identify hazards and associated risks in relation to EV parking and associated EV charging infrastructure
- demonstrate how the identified special hazards and risks are being addressed.

Informative commentary clarifies a 'recognised person' is as defined under Schedule 2 of the *EP&A(DCFS) Regulation*.

This position statement has been authorised for release by Chief Superintendent Fire Safety, FRNSW.

Contact us

For further information contact the Fire Safety Branch on (02) 9742 7434 or email firesafety@fire.nsw.gov.au.