

Electric vehicle carparks and electric vehicle charging stations

The transfer of electrical energy via publicly accessible distribution equipment and the allocation of dedicated electric vehicle (EV) carpark spaces raises safety concerns for Queensland Fire and Rescue (QFR) with regards to Firefighter Intervention.

QFR considers the electrical distribution installations for EV and the allocation of dedicated EV carpark spaces within a building represent a special hazard for Firefighters under National Construction Code (NCC) Part E1D17 Provision for special hazards.

EVs are powered by energy fuel cells, consisting primarily of a variety of Lithium chemistry technologies.

A failure event within a Lithium chemistry battery (overcharge, equipment failure or mechanical impact) has the potential to lead to a thermal runaway event within the EV battery, which may pose the following significant challenges for Firefighters in the management of the incident:

- Toxic smoke production,
- Flammable vapour cloud production,
- Rapid rate of fire spread,
- Heat release rate of EV fire,
- Proximity of adjacent fuel loads (other vehicles),
- Intervention and suppression resources in proximity.

EV in Carparks:

For Building Development Applications (BDA), QFR request building certifiers consider the suitability of existing Deemed to Satisfy provisions, in regard to the inclusion of EV spaces within a carpark, to provide suitable levels of protection for occupants and Fire Brigade intervention actions, such as:

- Fire detection and early warning intercommunication systems,
- Smoke management and air handling systems,
- Fire hydrants and sprinklers,
- Fire resistance of bounding construction.

EV charging stations in buildings:

For BDAs, QFR request building certifiers consider the following items under NCC Part E1D17 in regard to the installation of EV charging stations:

- Emergency shutdown controls for EV charging stations,
- Block plans for building to include location of EV charging stations,
- Block plans to include location of EV distribution boards and EV emergency shutdown controls,
- Vehicle impact protection (e.g., bollards) for EV charging stations.

¹ NCC 2022 Reference E1D17