Master Builders Association
New South Wales

Issue #2
June 2025

Retrofitting EV Chargers in Existing Buildings

Technical Bulletin

MBA Technical Committee

Author: Stan Giaouris

Contributor: David Solomon

Introduction

With the rise of Electric Vehicles (EVs), the demand for retrofitting EV charging stations in existing buildings has grown significantly. However, retrofitting EV chargers is a complex undertaking that requires careful planning and multidisciplinary consultation. For builders and building owners, understanding these considerations is essential to achieve compliance with regulatory standards, maintain effective safety provisions and protect the long-term integrity of the building.

Key Considerations for Retrofitting EV Chargers

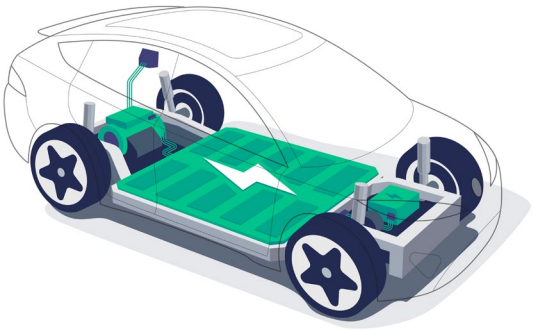
1. Electrical Infrastructure and Compliance

- **Assessment by Electrical Engineer:** Evaluate the existing switchboards, electrical feeds, and cable runs for their capacity to support the additional load variants that EV chargers require. This includes confirming compliance with relevant Australian Standards for cable sizing and distribution.
- **Potential Upgrades:** Older electrical systems may require significant upgrades, including new circuits, switchboard enhancements, and or transformer replacements, to handle the increased demand.
- **Design Requirements:** Engage a certified electrical engineer to design the electrical components of the system and ensure compliance with relevant safety and operational standards. Including electrical feed sizing, distribution board upgrades, etc.

2. Fire Safety and Protection

- **Fire Risk Mitigation:** Where possible do not install a battery charging station within building structures as Lithium-ion battery fires are intense and require copious amounts of water to extinguish. Consult an accredited Fire System Designer (FSD) to evaluate and advise on the current fire suppression systems as they will most likely not have the capacity to cater for EV charging functions and will most likely require upgrades, including sprinklers and or additional fire pumps, to manage these risks. Sprinklers may not currently be present in older buildings. Where sprinklers do exist, they will most likely not have been designed to suppress or extinguish an EV charging fire.
- **Changes in Fire Compartmentation:** Installing fire-rated walls around charging areas to prevent fire spread may alter paths of travel, requiring reconfiguration of evacuation routes. All designs will need to be developed by a registered designer and installed by a registered practitioner.
- **Regulatory Compliance:** Fire-rated elements and passive fire protection modifications will likely necessitate a Development Approval (DA), as these works do not qualify as exempt development under the relevant National Construction Code (NCC).
- **Mechanical Ventilation:** Increased mechanical ventilation systems will be required for the NSW Fire Brigade to be able to fight EV charger fires. All mechanical designs will need to be developed by a registered designer and installed by a registered practitioner.

3. Structural Integrity



- **EV Weight Considerations:** Modern EVs are significantly heavier than traditional vehicles, because the length of the cars chassis is lined with large heavy batteries, on average 30% more than a car with a combustion motor.
- Older concrete slabs and other concrete elements (columns and column capitals) must be assessed by a structural engineer/designer to ensure they can accommodate increased loads without affecting structural integrity or causing excessive deflection and possible failure.
- **Structural Upgrades:** If deficiencies are identified, upgrades to the building's structure may be required. All designs will need to be developed by a registered designer and installed by a registered practitioner.

4. Accessibility and Compliance

- **Accessibility Standards:** EV charging installations must comply with accessibility requirements outlined in AS 1428.1 (Design for access and mobility Part 1: General requirements for access - New building work), and the same access requirements apply to all the facilities in the direct vicinity of the charging station that are contained in the same building envelope.
- **Paths of Travel:** Modifications, including fire-rated walls or structural reinforcements, may affect evacuation routes of egress and ingress and may require redesign to maintain NCC compliance. Confirmation should be sought from local or jurisdictional authorities, e.g. council.

5. Insurance and Risk Management

- **Insurance Implications:** Building owners must consult their insurers to understand how retrofitting EV chargers may impact policy coverage and premiums. Non-compliance with fire safety and structural standards/regulations could result in denied claims and or void existing policies.
- **Fire Brigade Consultation:** Engage the local fire brigade early in the planning process to understand how to achieve compliance with their specific requirements and align emergency response plans with the proposed new infrastructure.

6. Recommended Disciplines for Consultation

Before undertaking any EV charging retrofit, the following professionals should be engaged to address key aspects of the project:

- **Fire Engineer:** Assess fire safety provisions and recommend upgrades to fire protection systems.
- **Building Certifier:** Ensure the work complies with the NCC and determine if an Alternative Building Solution/Performance Solution. This will guide the preparation of a Building Code Compliance Report and the DA, CDC or Exempt approval process.
- **Structural Engineer/Designer:** Evaluate the structural integrity of concrete slabs and other relevant concrete elements to accommodate heavier EVs and ensure long-term performance for the life cycle of the building.

- **Electrical Engineer:** Design and verify the electrical infrastructure, including switchboards, cable sizing, and compliance with Australian Standards.
- **Insurer:** Confirm that the retrofit will not adversely impact the building's insurance coverage.

7. Steps for a Successful EV Charging Retrofit

1) **Initial Assessment:**
   - Engage a competent person to conduct a thorough audit of the building's existing electrical, structural, and fire safety systems.
2) **Design and Planning:**
   - Develop a compliant and coordinated design with input from all relevant disciplines, including fire safety provisions, evacuation plans and available electrical supply loads.
   - Advice from the Certifying authority regarding Development Approval for the fire upgrade works (if required).
3) **Permitting and Approvals:**
   - Lodge Development Applications (if required) and make sure all works meet the relevant NCC and local council requirements.
4) **Construction and Installation:**
   - Use licensed contractors and adhere to preferred industry practices during installation to avoid defects or non-compliance.
   - Where works are on a residential building, Home Building Act (1989 No 147 – current Aug 2024) will apply, and works over $20,000 will require relevant insurances.
   - Fire upgrades will require amendments to the building fire schedule and subsequent Annual Fire Safety Statement (AFSS).
5) **Completion and Commissioning:**
   - Test the charging systems, fire safety upgrades, and structural modifications to verify performance and compliance has been achieved and documented.
   - Issue documentation required for new Occupation Certificate at completion.
   - Details of EV system to be provided to building insurer.
   - New building AFFS to be displayed in the building foyer, update and install amended system interface diagrams, valve registers, pressure gauge schedules and new maintenance agreements entered.
6) **Ongoing Maintenance (O&M's):**
   - Establish a maintenance schedule document that promotes the continued optimal and safe operation of the EV charging infrastructure.
   - Engage a licenced and registered fire contractor for required ongoing maintenance as per new AFSS requirements.

Conclusion

Retrofitting EV chargers into existing buildings is a multidisciplinary challenge that requires careful coordination, regulatory compliance, and a strong focus on safety. Builders and building owners must engage the appropriate professionals to address fire safety, electrical capacity, structural integrity, and insurance considerations.

By proactively consulting with fire engineers, certifiers, structural engineers/designers, electrical engineers, insurers, and local fire brigades, building owners can mitigate risks, achieve compliance with the relevant NCC and Standards, and provide a safe environment for EV users and building occupants.

As EV adoption continues to grow, it is critical to approach retrofits with thorough planning and a commitment to safety and compliance, promoting long-term sustainability and operational efficiency.

There are numerous elements in this bulletin that all require serious consideration, compounded by the regulation and legislation being adjusted by both the Safety Regulator (SafeWork NSW), the Building Commission NSW.

Revising our approach to align with these forthcoming legislative and regulatory changes will benefit Master Builders Association of NSW Members and the broader Building and Construction Industry.

Enquiries: housing@mbansw.asn.au