

A guide to preparing your Strata building for Electric Vehicle Charging



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EV Charging for Strata Buildings

Introduction to EV Charging

- Electric Vehicle (EV) charging is predicted to become an essential service for many residential strata buildings over the next 8 years.
- The [New South Wales](#) government targets between 50% to 53% of new car sales to be electric vehicles by 2030
- Buildings nearer the city are more likely to have higher uptake of EVs due to the convenience, efficiency and environmental benefits of EVs and the shorter trips that people make to work, education and shops etc.
- In Strata buildings, communal charging facilities are unlikely to succeed due to:
 - The lack of common property parking spaces to be used for EV charging bays;
 - Difficulties in the equitable use of shared charging facilities
 - Insufficient time in the day to adequately charge the required quantity of vehicles

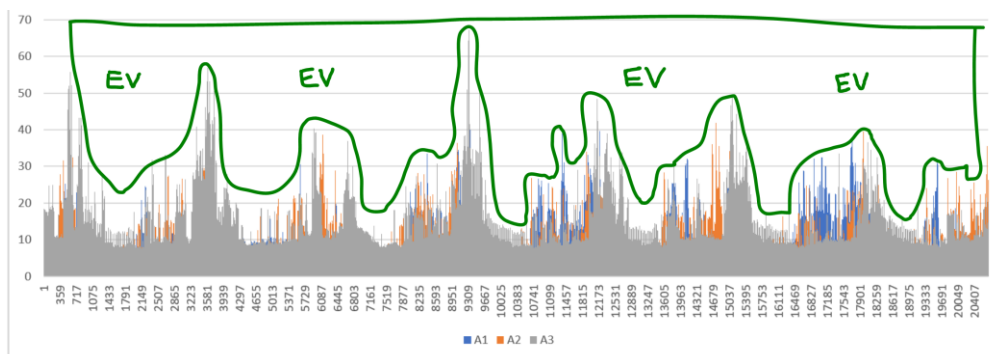


Schneider EV-Link Wall Mounted EV Charger

EV Charging for Strata Buildings

EV Charging – Power requirements

- EV charging takes a large amount of power and needs to be carefully planned for strata buildings.
- Whereas a domestic oven might require 15Amps of electrical current to run, a moderately fast EV charger requires 32Amps of current.
- In strata buildings with many parking spaces, the reality of many EV chargers being required means that substantial communal infrastructure is required to be installed prior to individuals installing chargers.
- Because the supply of electricity to buildings is finite, a centralised control system must be used in order to distribute power fairly and to remove the risk of overload of the electrical cables and switchboards.
- Below is an example of the amount of electrical current being used in a strata building at different times over a period of 1 week. It can be seen that there is a great deal of spare electrical capacity which can be utilised for EV charging – but only by monitoring and carefully controlling usage at all times. This way we can use the maximum capacity available for charging EVs, without overloading any cables or systems.



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EV Charging – Main Switchboard requirements

- In order to be able to deliver the full load current which is allocated to a strata building by the distribution network (E.g. Ausgrid or Endeavour Energy), it is important to ensure the electrical infrastructure such as the Main Switchboard, Meter Panels, Consumers Mains and Service Mains (from the substation or the street to the building) are in good condition; can function as intended; and the correct circuit protection in place as required by current Australian Standards and the NSW Service and Installation Rules.
- A Main Switchboard which has been designed and manufactured to AS/NZS 61439-2016 is recommended.
- Calculations on the existing or proposed Mains cables, sub-mains and sub-circuits need to be done by the electrician or electrical engineer to ensure that the cables are of an adequate size to safely deliver sufficient power to charge multiple EVs at the same time.
- The Main Switchboard needs to incorporate a Power Meter which can interface to an EV charging control system. An example Power Meter is shown below:



Schneider PM5000 Power Meter

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EV Charging – Metering requirements

- Depending on whether the individual units have their electricity meters in the Main Switchroom, or on each individual level of the building, the metering of the power used by the EVs will be done differently.
- Where all the electricity meters are in the Main Switchroom and this is located near where the vehicles are parked, then the EV charging power for each parking space can be connected through the Electricity Retailer’s electricity meter for the relevant unit. I.e. each lot’s existing electricity meter measures its own EV charging power used. This means that the electricity is paid for by the resident to the Electricity Retailer in their normal electricity bill, along with lighting and power points electricity used in the apartment.
- Where the electricity meters are remote from the parking areas, it is usually more convenient not to run individually metered circuits to each parking space. In this case, the strata may decide to install additional “House Services Distribution Boards” for the EV chargers, which would be connected to the Main Switchboard. Power consumed is metered (usually with CT metering) at the Main Switchboard and paid for communally by the Strata Plan. Power used by each EV charger is recorded via the EV Charging Control System and the Strata Management would then back-charge each lot for the power used by their EV Charger. RFID tags (like the tag you swipe to unlock a door in a commercial building) are issued to account holders. The RFID tag is swiped at the EV Charger in order to ensure that power consumed is recorded to the correct billing account.



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EV Charging – Infrastructure requirements

- Modern AS/NZS 61439 compliant Main Switchboard with Power Meter.
- Cable trays to reticulate power and control cables to each parking space
- For sites where EV power will be metered individually using existing Electricity Retailer metering, an additional 40A Circuit Breaker at the meter panel is required for each unit having EV charging installed in the parking space.



Meter Panel with 40A Sub-Mains to parking spaces for EV Charging

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- For sites where EV power will be metered by the EV Charging Control System, one or more EV Distribution Boards will be required.
- A Cat6 data cabling network is required to connect the EV Charging Control System in the Main Switchroom to the EV Chargers in each parking space. This allows the Control System to:
 - Measure the available power on the Mains Cables
 - Allocate the available power to the EV Chargers based on pre-determined logic and priorities
 - Ensure there is no overload of the electrical infrastructure.
- EV-Link Charge Controller



- Circuit Protection Devices for 240VAC outlets for connection of EV Chargers:



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- Isolating Switch for Connection of EV wall mounted charger



- EV-Link Chargers – With or without RFID as required for billing and security reasons.



Schneider EV Link Wallbox 7.4kW

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EV Charging – Standardisation Requirements

- Because of the need to carefully control EV charging at Strata Buildings and the need to maximise charging performance, a standardised system of charging equipment is required.
- EV Charging Controllers are brand-specific to the chargers. So, if the Strata Building implements a “Brand A” EV Charging Control System, then all EV drivers will need to use “Brand A” EV Chargers at the Strata Building.

EV Charging – By-law requirements

- Strata Plans will need to implement By-Laws requiring standardisation of EV Charging equipment before residents begin to install EV Chargers.
- By-laws will need to require that:
 - Residents wishing to charge EVs at the Strata Building only install EV Charging equipment in accordance with a site-specific EV Charging Installation Specification.
 - Residents wishing to charge EVs at the Strata Building use only Specified EV Charging Equipment (i.e. system brand and charging capacity are standardised).
 - EV Charging equipment be installed in certain locations, and not in prohibited locations (consider height of equipment too).
 - Electrical Circuits for the connection of EV chargers must be provided with the Specified Circuit Protection and Control Devices.
 - Commissioning of the EV-Link Charger onto the Strata Plan’s EV Charging Control System will need to be done by the Strata Plan’s nominated EV System Contractor.
 - Electrical Wiring and Data Cabling will need to be installed in a certain way, and in a certain location, and depending on the Strata Plan’s requirements, possibly by a nominated installer. Such specifications would include for example – All power cables to be installed on a certain cable tray, using a certain cable type, and tied down in a certain way.
 - Power for EV Charging is metered and paid for in a certain way
 - RFID tags and systems for billing control and security are used and maintained in a certain way.
 - EV Charging users who are using communal power agree to a certain payment scheme.

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Why Schneider Electric?

- Schneider Electric (SE) is the No.1 brand of choice for electrical equipment and technology worldwide. SE operates in 100 countries around the world and employs over 135,000 people.
- Schneider Electric was established in 1836. In 2021, Schneider Electric was ranked most sustainable company in the world out of 8,000 companies assessed by Corporate Knights.
- Schneider Electric invests heavily in R&D and product development.
- Schneider Electric has an absolutely complete product offering from the 400Amp Main Circuit Breaker at the switchboard, to the metering, the RCD safety switches, the EV charge controllers and the EV chargers. The entire system is engineered to work together seamlessly.
- Schneider Electric has excellent training and support services at Macquarie park in Sydney.
- Schneider Electric is here for the long haul and offers long-term solutions and support.

How to use EV Link chargers:

<https://www.youtube.com/watch?v=EFGyejNVhyl>



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Why Sydney Electrical and Data?

- Sydney Electrical & Data are specialists in large power distribution systems for strata buildings.
- Sydney Electrical & Data have the experience and engineering expertise to design systems which are reliable, safe, long-lasting and offer better value for money than others.
- Sydney Electrical & Data have designed and installed Main Switchboards and EV charging solutions for strata buildings and commercial buildings throughout Sydney and have a reputation for high quality work.
- Sydney Electrical & Data:
 - Make your Main Switchboard Upgrade project smooth and trouble-free.
 - Design your MSB and EV charging installation to last for 30 years plus.
 - Understand the large investment that the Owners are making, and strive to deliver the best value for money by using the best quality products and materials, installed with care by our team of experts.



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