



Design Guidelines for Accessible EV Charging Stations

Contents

Section 1: Scope and general	4
1.1 Scope	4
1.2 Referenced documents	4
1.3 Terms and definitions	4
1.4 Accessible charging spaces	5
Section 2: Charging space layout	6
2.1 General	6
2.2 Charging space dimensions	6
2.3 Pavement slope and surface	6
2.4 Headroom	6
2.5 Kerb ramps	6
2.6 Bollards	6
2.7 Wheel stops	6
Section 3: Charging space identification	20
3.1 Space identification	20
3.2 Space delineation	20
3.3 “Priority Bay Use Last” designation	21
Appendix	
A Provision of features for people with disabilities	24



RAA's AoC artwork series was created by Elizabeth Close, a Pitjantjatjara and Yankunytjatjara woman from the APY Lands in Central Australia, now living and working in Karna Country.

In the spirit of reconciliation RAA acknowledges the Traditional Custodians of country throughout Australia and their connections to land, sea, and community. We pay our respect to their Elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples today.

Preface

RAA recognises the transition to electric vehicles (EVs) and zero emission mobility is here, both globally and at home in South Australia.

Demand for EVs is now far outstripping supply, with forecasts by Carloop predicting there will be between 15,000 and 25,000 electric cars on South Australian roads by the end of 2025.

As the state's largest membership organisation with a 120-year strong motoring heritage, RAA is proud to be supporting South Australia's pathway toward a decarbonised transport system and more sustainable and liveable state.

In partnership with the South Australian Government, RAA is building South Australia's first statewide EV charging network, RAA Charge, with 140 charging sites and more than 500 charging bays being installed across the state by 2024.

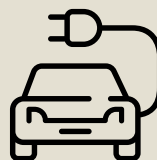
Importantly, RAA is committed to making sure EV charging infrastructure is safe and accessible for all drivers.

At present, there are no regulations or design standards within Australia to guide the design and installation of EV charging infrastructure including the hardware and space around it.

As such, RAA conducted an accessibility trial to assist in the design and construction of EV charging stations. The trial involved several drivers with diverse abilities, using a variety of EVs with different charge port locations. The trial charging bays were able to be tested for their functionality and accessibility for all participants.

The trial highlighted some significant differences in the use and operation of an EV charging bay when compared to a standard car parking space. Whilst a standard accessible parking bay provides for the entry and exit requirements for drivers with disabilities, EV charging requires the driver to exit their vehicle, move to the charger, remove the connector and carry the charging cable back to the charging port which may be on the front, side or rear of the vehicle.

The learnings of this trial have informed the construction of South Australia's EV charging network, as well as the development of these guidelines. In publishing and sharing the guidelines, RAA hopes to ensure that all EV charging infrastructure in South Australia is accessible for all drivers.



“Demand for EVs is now far outstripping supply, with Forecasts by Carloop predicting there will be between 15,000 and 25,000 electric cars on South Australian roads by the end of 2025.”

Section 1: Scope and general

1.1 Scope

This guideline specifies minimum requirements for the design and construction of EV charging stations, including stations that are accessible to and usable by people with disabilities.

The Guideline does not specify details regarding the selection or installation of the actual charging system.

For the purpose of developing this Guideline, the KEMPOWER C Station S series and Jetcharge Chargemate charging systems were referenced.

1.2 Referenced documents

The following documents are referenced for the development of this Guideline:

- *Australian Standard 1428 Design for access and mobility. Part 1: General requirements for access—New building work. 2009 (AS1428.1)*
- *Australian Standard 2890 Parking facilities. Part 6: Off-street car parking for people with disabilities. 2022 (AS2890.6:2022)*
- *British Standards Institution, PAS 1899:2022, Electric vehicles - Accessible charging - Specifications*
- *Urban Foresight, Guidance on improving Electric Vehicle Charging Infrastructure, September 2021.*
- *U.S. Access Board, Design Recommendations for Accessible Electric Vehicle Charging Stations, September 2022.*

1.3 Terms and definitions

- **Accessibility:** The degree to which a product, device, service, or environment can be independently accessed or used.
- **Accessible:** Having features to enable use by people with a disability.
- **Accessible charging space:** An EV charging space which has increased circulation space to cater for drivers who may have a disability.
- **Bollard:** A post of minimum 1300mm height installed adjacent to a chargepoint to protect the chargepoint from vehicle collision.
- **Charger:** A device with one or more charging ports and connectors for charging EVs. A charger is also called electric vehicle supply equipment (EVSE) or EV charger.
- **Charging station:** One or more EV chargers at a common location. A large site can have multiple charging stations, such as in various parking lots and parking garages.
- **Clear zone:** A clearly marked area free of obstruction with a clear width of 1540mm to allow circulation for a person using a wheelchair.
- **Connector:** The device that attaches EVs to charging ports to transfer electricity. Connectors are also referred to as plugs.
- **Contactless payment methods:** A secure method for consumers to purchase services using a debit, credit, smartcard, or another payment device by using radio frequency identification (RFID) technology and near-field communication (NFC).
- **Electric Vehicle (EV):** An automotive vehicle that is either partially or fully powered by electricity.
- **Shall:** Indicates that a statement is mandatory.
- **Shared area:** An area adjacent to a dedicated space provided for access or egress to or from a parked vehicle and which may be shared with any other purpose that does not involve other than transitory obstruction of the area, for example, a walkway, a vehicular aisle, dual use with another adjacent dedicated space.
- **Should:** Indicates a recommendation.
- **Site:** A parcel of land bounded by a property line or a designated portion of a public right-of-way.
- **Vehicle charging inlet:** The inlet on a vehicle that a connector is plugged into. Also referred to as a charging port, or charging door.

- **Vehicle charging space:** A space to park a vehicle for charging. A vehicle charging space can be a marked parking space, or an unmarked area adjacent to an EV charger.
- **Wheel stop:** Wheel stops are an effective way to prevent vehicle overhangs from reducing clear widths of accessible paths and to assist attentive drivers when parking their vehicles.

1.4 Accessible charging spaces

Although EV chargers are often installed in existing car parks, there are some significant differences in use that warrant EV charging spaces be treated differently from parking spaces.

EV charging requires drivers with disabilities to exit their vehicle, traverse to the charger, and carry the connector back to their vehicle charging inlet (which may be on the opposite side of where they enter/exit their EV). Since EVs do not have a standard location for the vehicle charging inlet, manoeuvrability around the entire EV is needed. Also, as DCFC cables get heavier

and shorter to achieve faster charging, EVs need to be parked in a way that aligns the vehicle charging inlet with the charger, which could conflict with the orientation needed for a driver with a disability to use the access aisle.

By contrast, a driver with a disability can use an accessible parking space as long as the vehicle is oriented with the access aisle; a person with a disability could either pull-in or back-in to the parking spot to get the access aisle on the appropriate side. The additional space provided by an access aisle is needed only by the person with a disability (who may be either a driver or passenger) and additional space on the opposite side of the vehicle is usually not needed.

Because of this fundamental difference in use, this document differentiates between parking and EV charging, and primarily focuses on the needs of an EV driver with a disability. The needs of passengers with disabilities are not addressed in this document because it is presumed passengers with disabilities could enter or exit the vehicle at a nearby accessible parking space or passenger loading zone.



Section 2: Charging space layout

2.1 General

This section specifies layout requirements for charging spaces and requirements for vehicular access to those spaces, including spaces for drivers who may have a disability.

2.2 Charging space dimensions

Figure 1 shows the minimum sizes for a charging station that is designed to cater for two vehicles, including one vehicle which may have a driver with a disability. The charging station which can cater for a driver with a disability is referred to as the 'accessible charging space'.

Figure 2 shows the minimum sizes for a charging station which caters for four vehicles, including one vehicle which may have a driver with a disability.

Figure 3 shows the required location of the charger and bollards for a two car charging station.

Figures 4 and 5 show the required location of the charger and bollards for a four car charging station.

Figures 6 to 12 show the different parking space options depending if a raised kerb and footpath is existing or to be provided.

Where defined by line marking, measurements shall be taken from the centre of marked lines.

2.3 Pavement slope and surface

Each charging space shall comprise a firm plane surface with a fall not exceeding 1:40 in any direction (1:33 if the surface is a bituminous seal). These areas should have a slip-resistant surface in accordance with AS 2890.6:2022.

2.4 Headroom

The headroom above each charging space and adjacent shared area, measured from the ground level of the charging space shall be a minimum of 2500mm in accordance with AS 2890.6:2022.

2.5 Kerb ramps

Where kerb ramps are to be provided they should be located as illustrated in Figures 10, 11 and 12. Kerb ramps should comply with AS 1428.1.

2.6 Bollards

Bollards shall have an installed height of a minimum 1300mm above the car park floor, with a minimum 300mm retro-reflective coloured band, located at a minimum 900mm in height above the car park floor.

Consideration should be given to the bollards ability to withstand an impact, and the need to protect infrastructure from vehicle collisions.

Installation of a bollard shall ensure a minimum 1000mm clear access path when used in the walkway adjacent to an accessible charging space. See Figure 3 and Figure 4 for examples.

2.7 Wheel stops

Wheel stops shall not be used in accessible charging spaces.

When used in other spaces, wheel stops shall be manufactured and installed in accordance with the requirements set out in AS/NZS 2890.1:2004.

Figure 1: General circulation requirements – 2 space

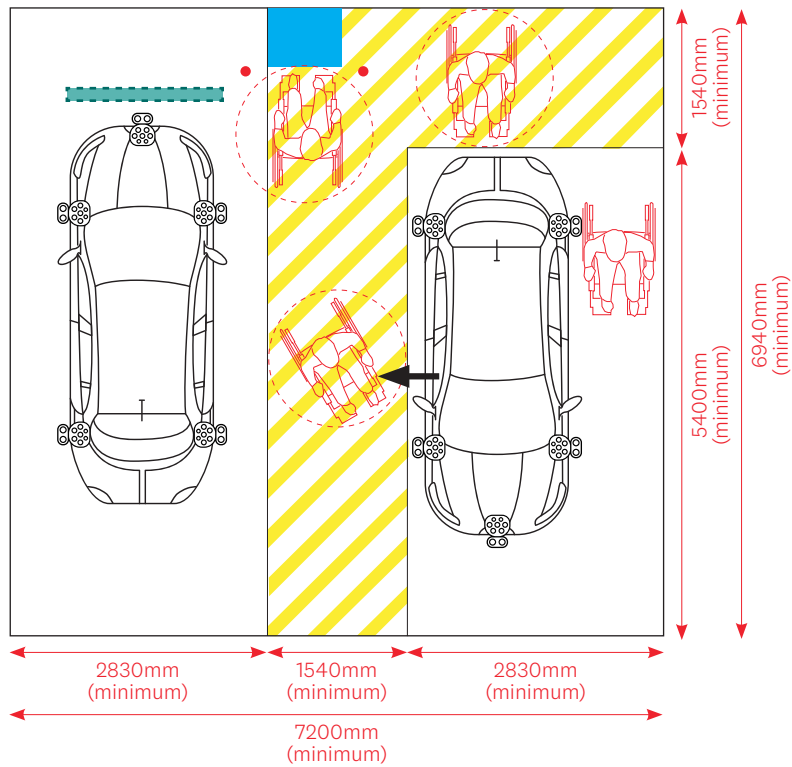
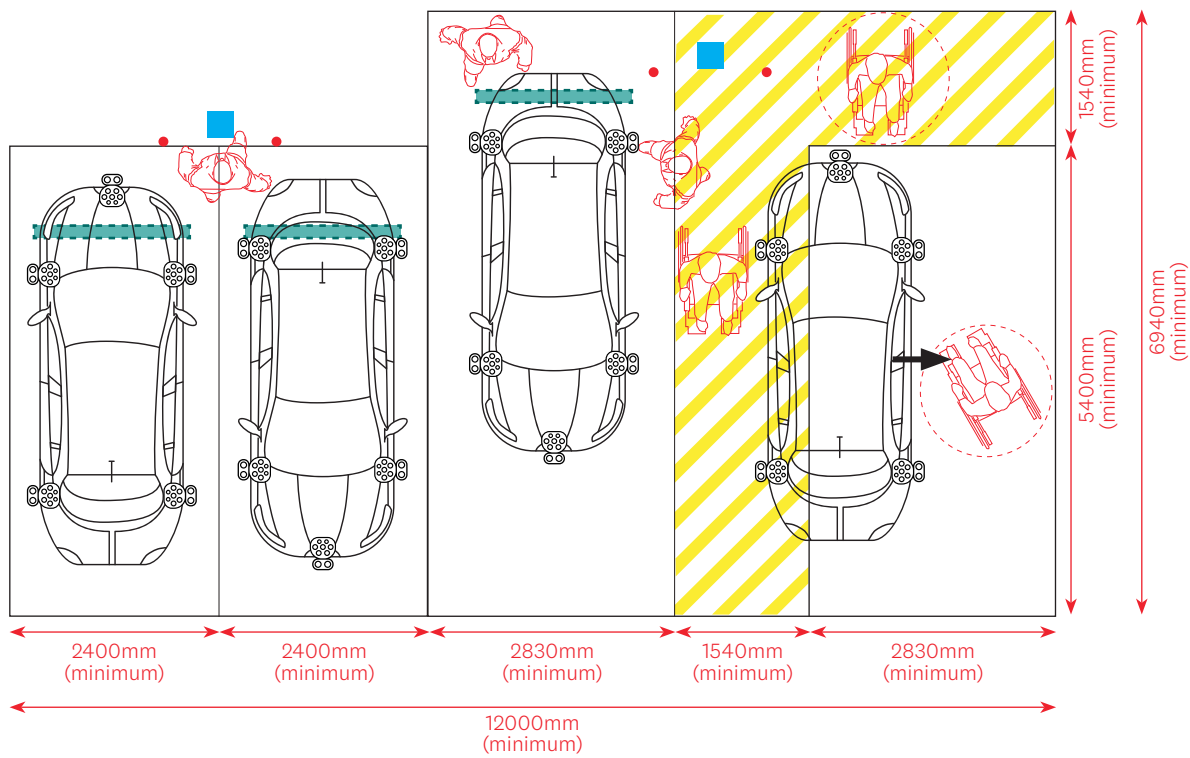


Figure 2: General circulation requirements – 4 space









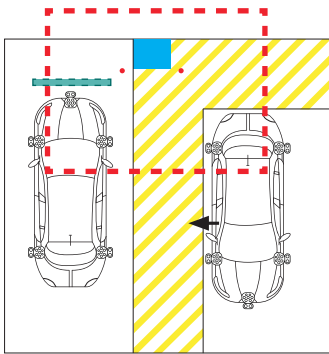
	Vehicle charge inlet		1540mm wheelchair circulation area
	Clear zone		Wheel stop
	Charger		Safety bollard

Figure 3: Charger / bollard location - 2 space



Kerb edge / charging space boundary

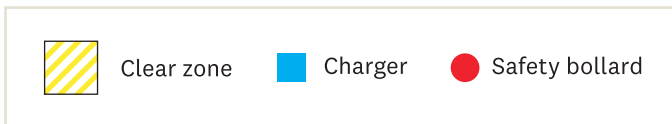
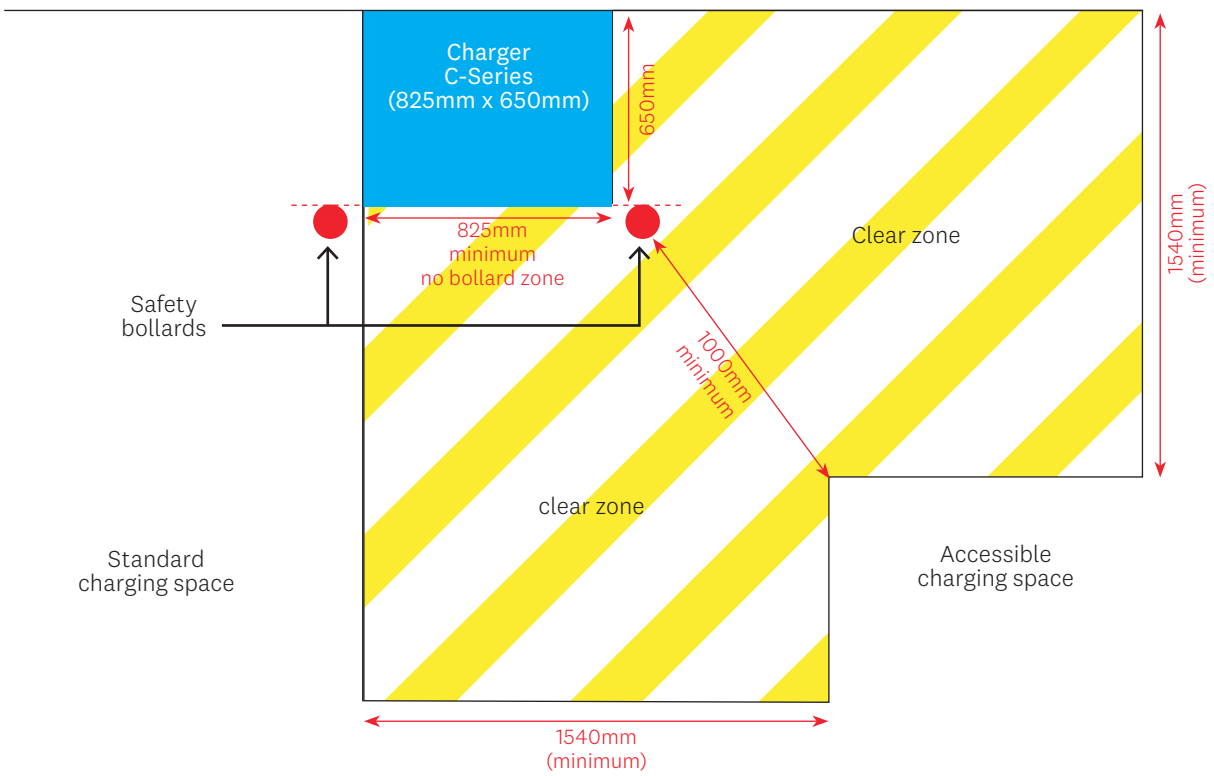


Figure 4: Charger / bollard location - 4 space accessible

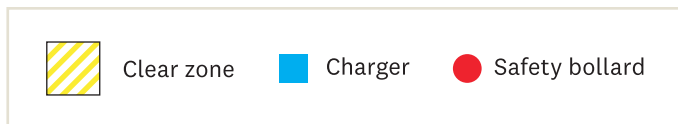
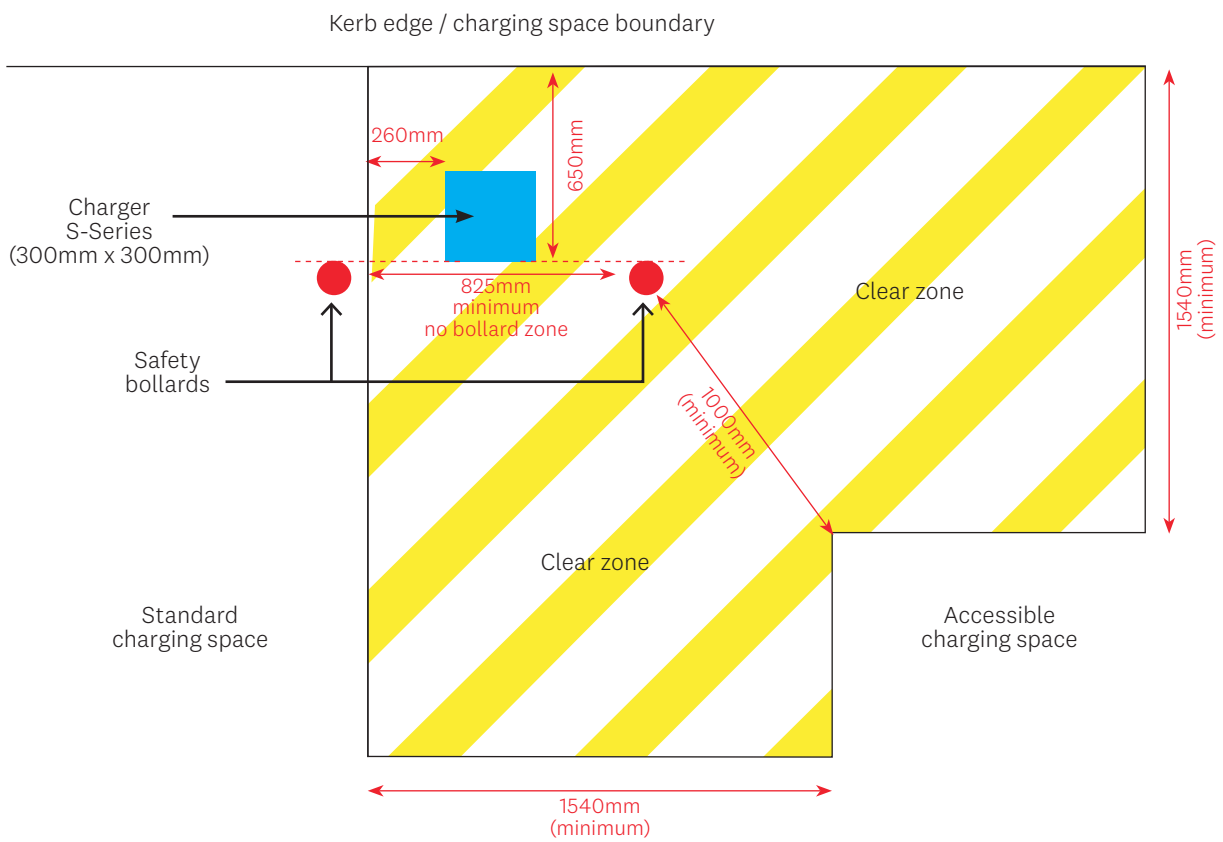
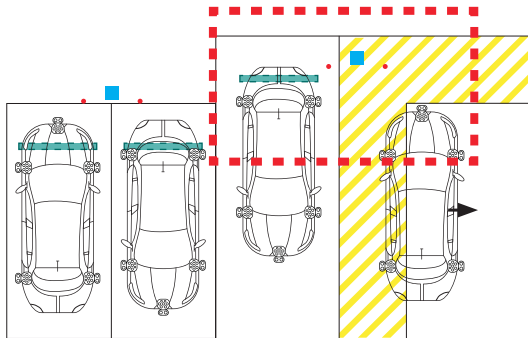


Figure 5: Charger / bollard location - 4 space standard

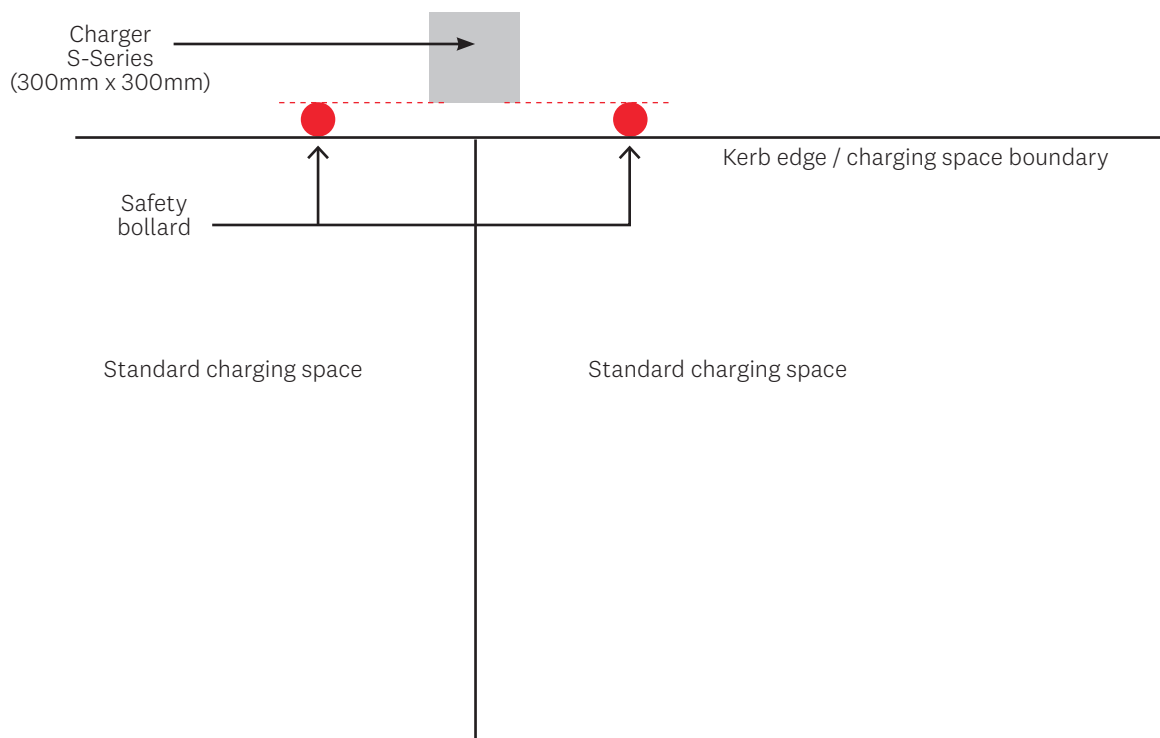
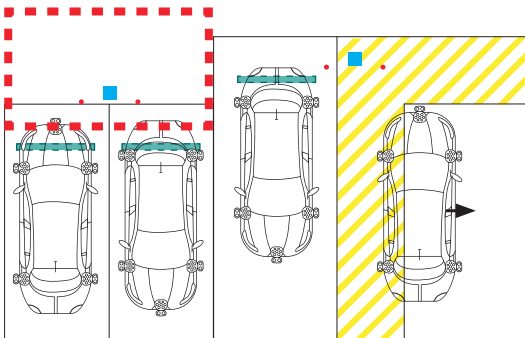


Figure 6: Kerbless edge – 2 space

Note: for full dimensions refer to figures 1, 2, 3 and 4.

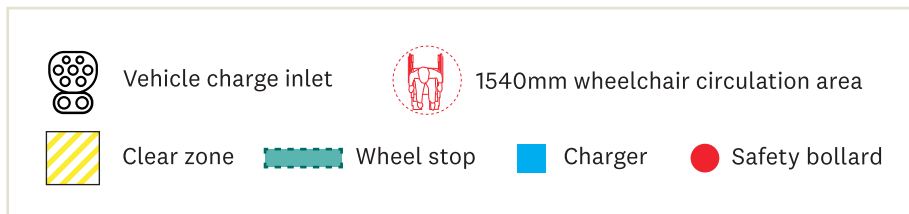
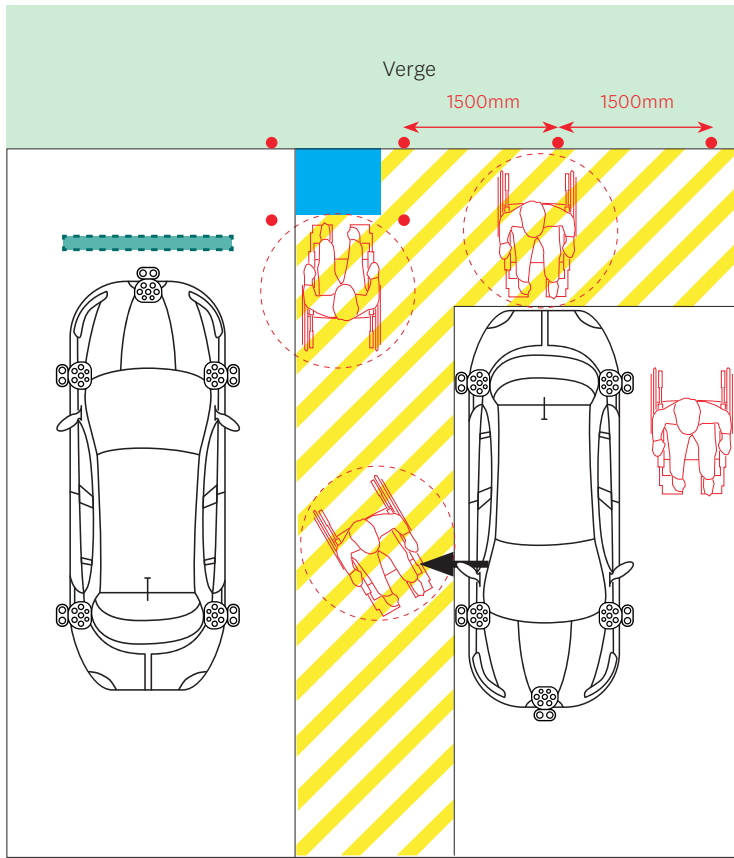
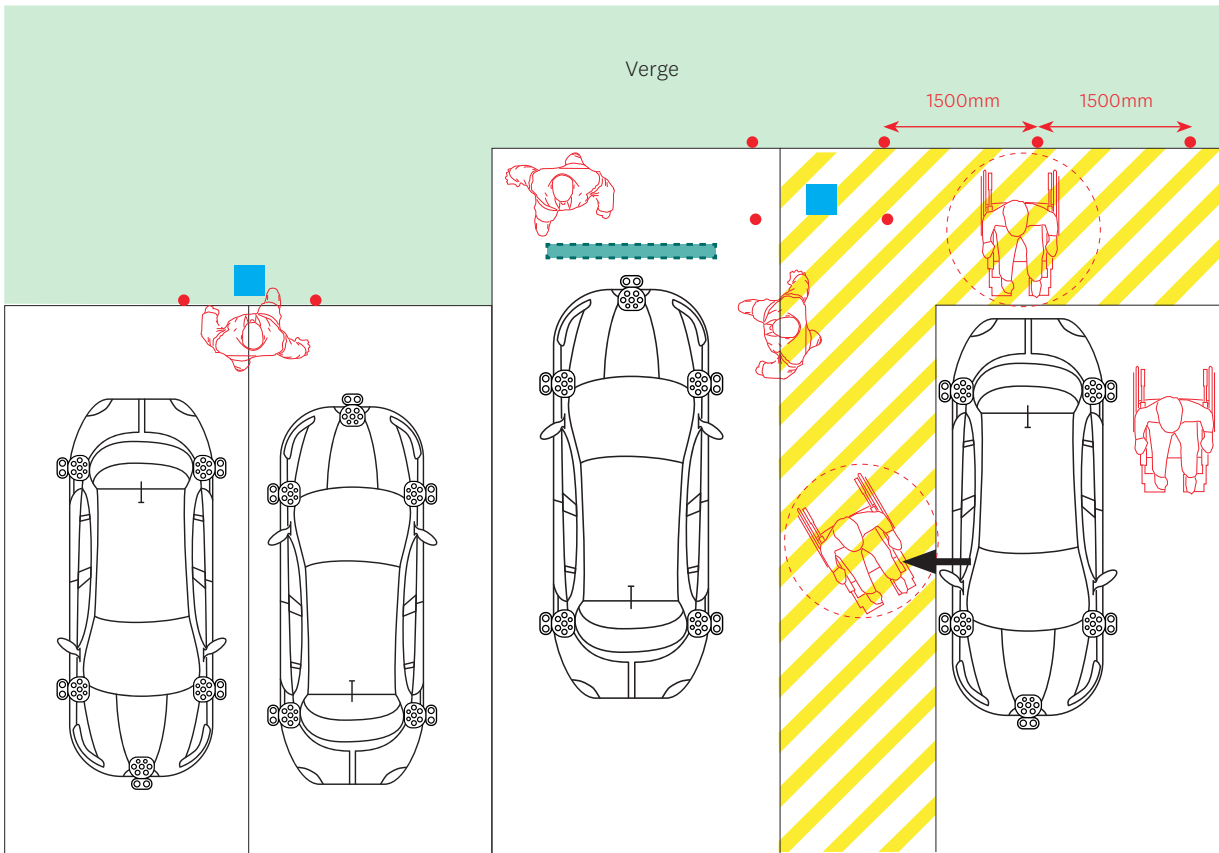


Figure 7: Kerbless edge - 4 space

Note: for full dimensions refer to figures 1, 2, 3 and 4.









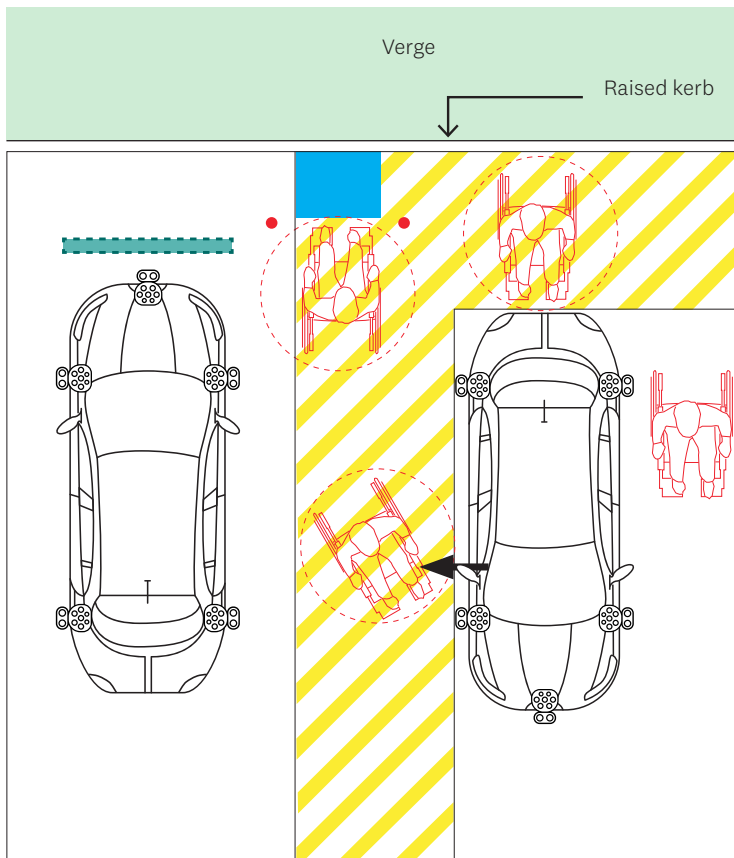
	Vehicle charge inlet		1540mm wheelchair circulation area	
	Clear zone		Wheel stop	
		Charger		Safety bollard

Figure 8: Raised kerb edge, no footpath – 2 space

Note: for full dimensions refer to figures 1, 2, 3 and 4.









	Vehicle charge inlet		1540mm wheelchair circulation area
	Clear zone		Wheel stop
			Charger
			Safety bollard

Figure 9: Raised kerbless edge - 4 space

Note: for full dimensions refer to figures 1, 2, 3 and 4.

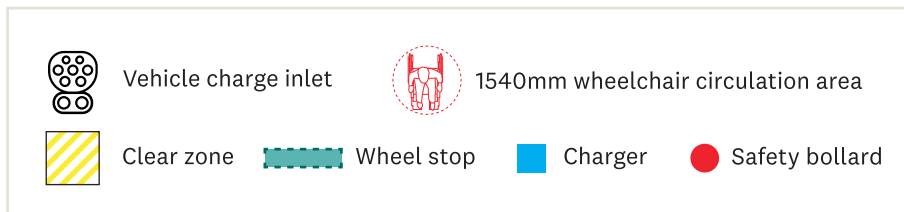
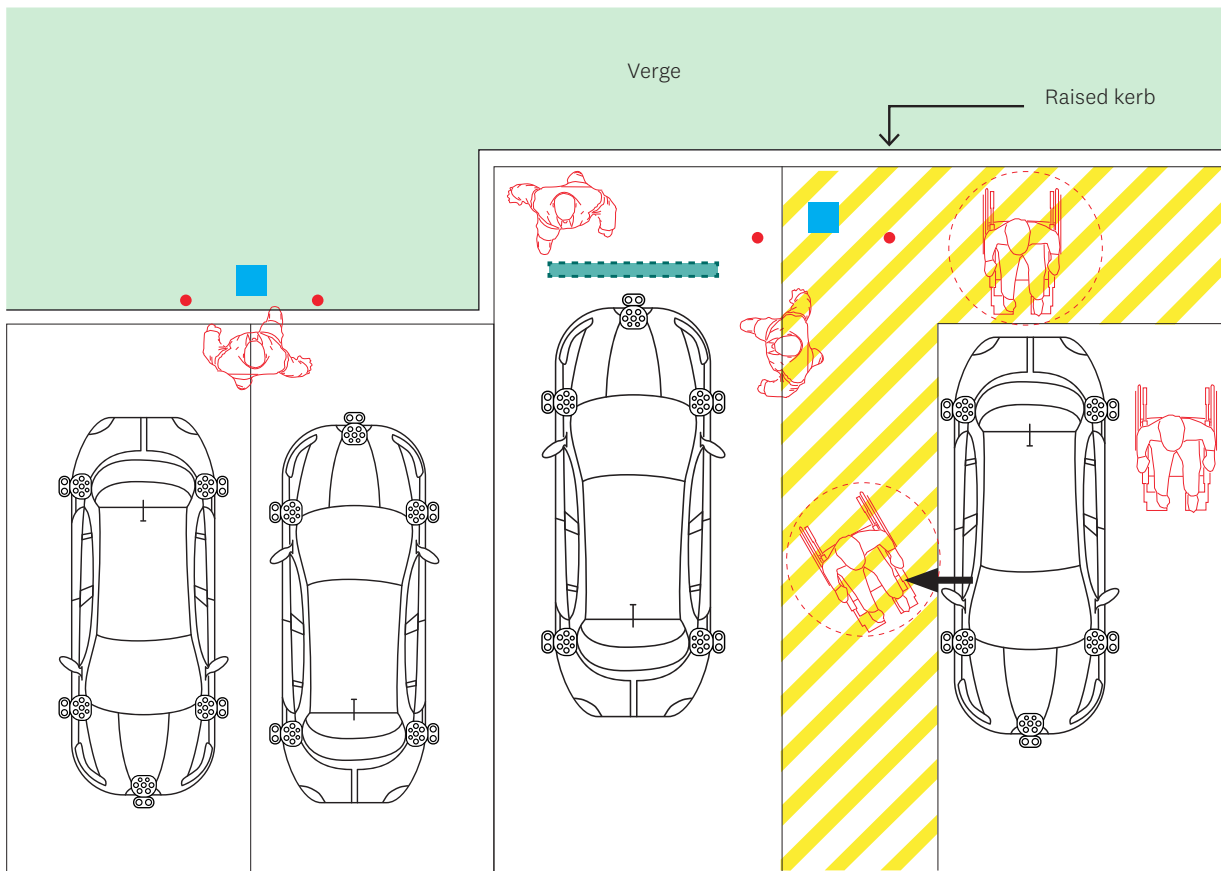


Figure 10: Raised kerb edge with footpath – option 1

Note: for full dimensions refer to figures 1, 2, 3 and 4.

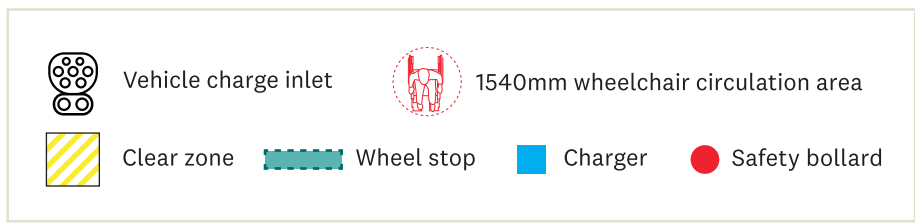
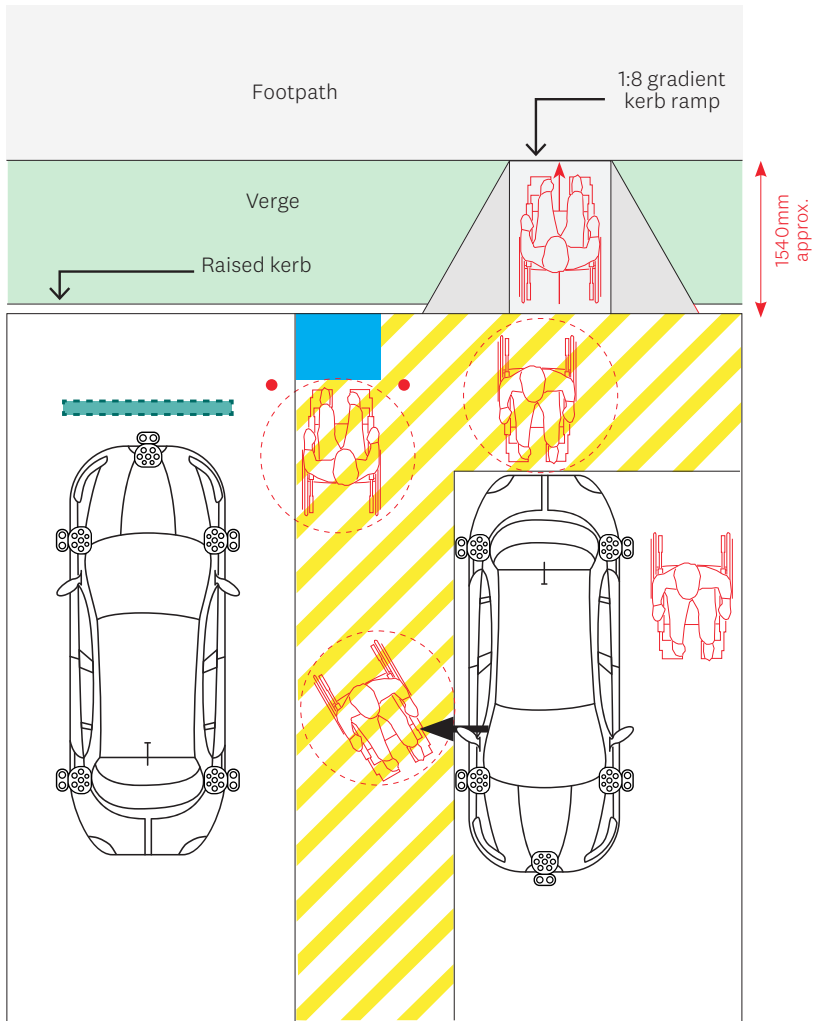


Figure 11: Raised kerb edge with footpath - option 2

Note: for full dimensions refer to figures 1, 2, 3 and 4.

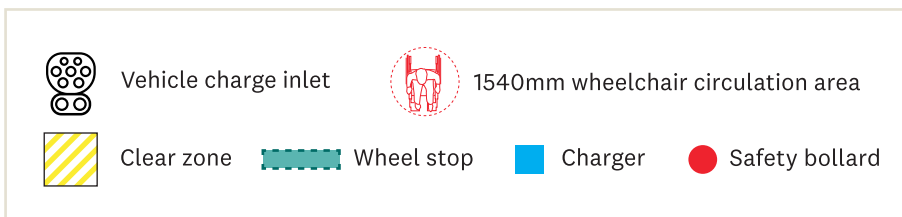
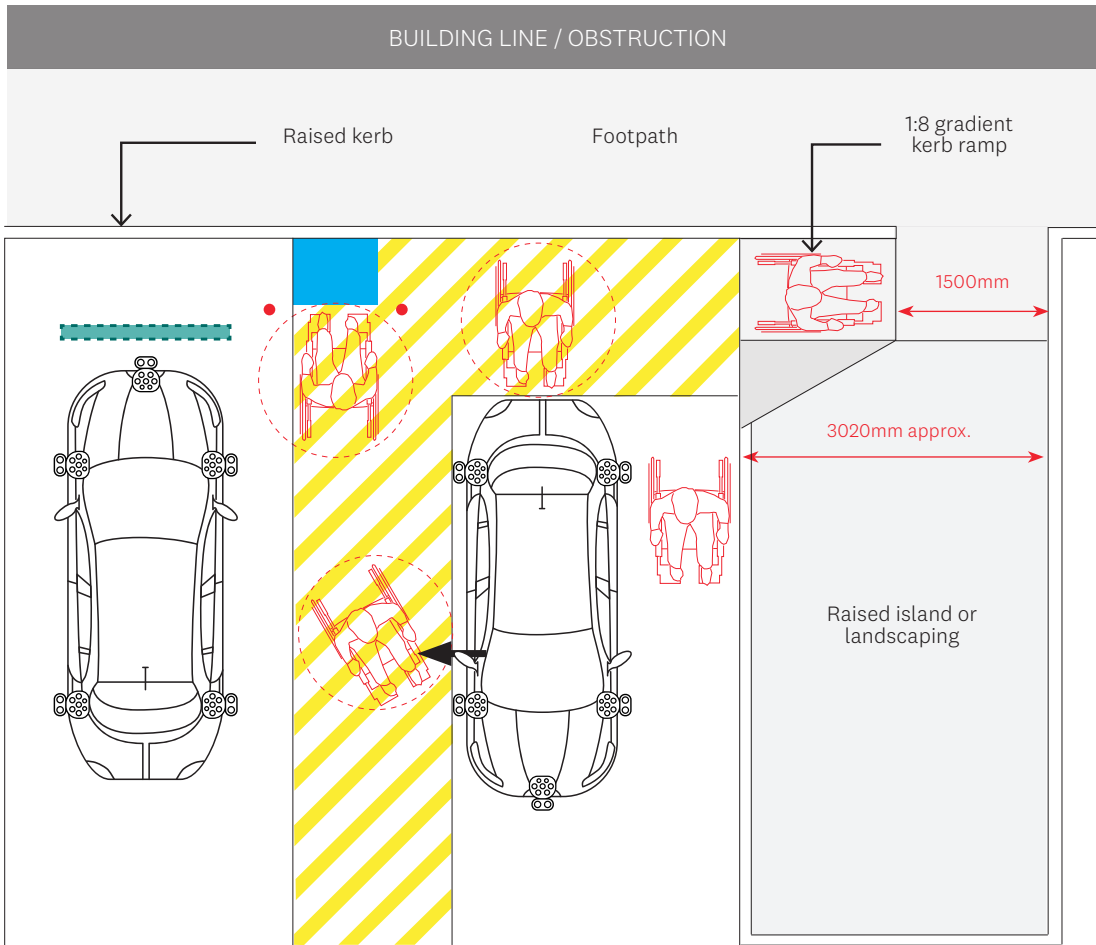
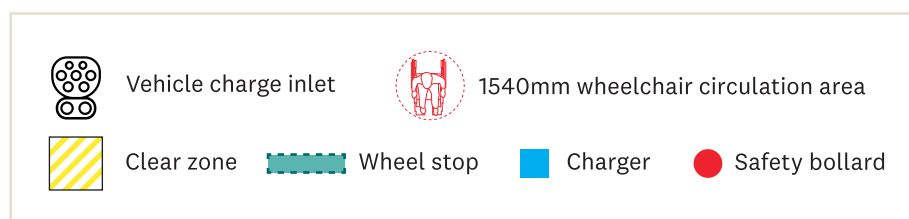
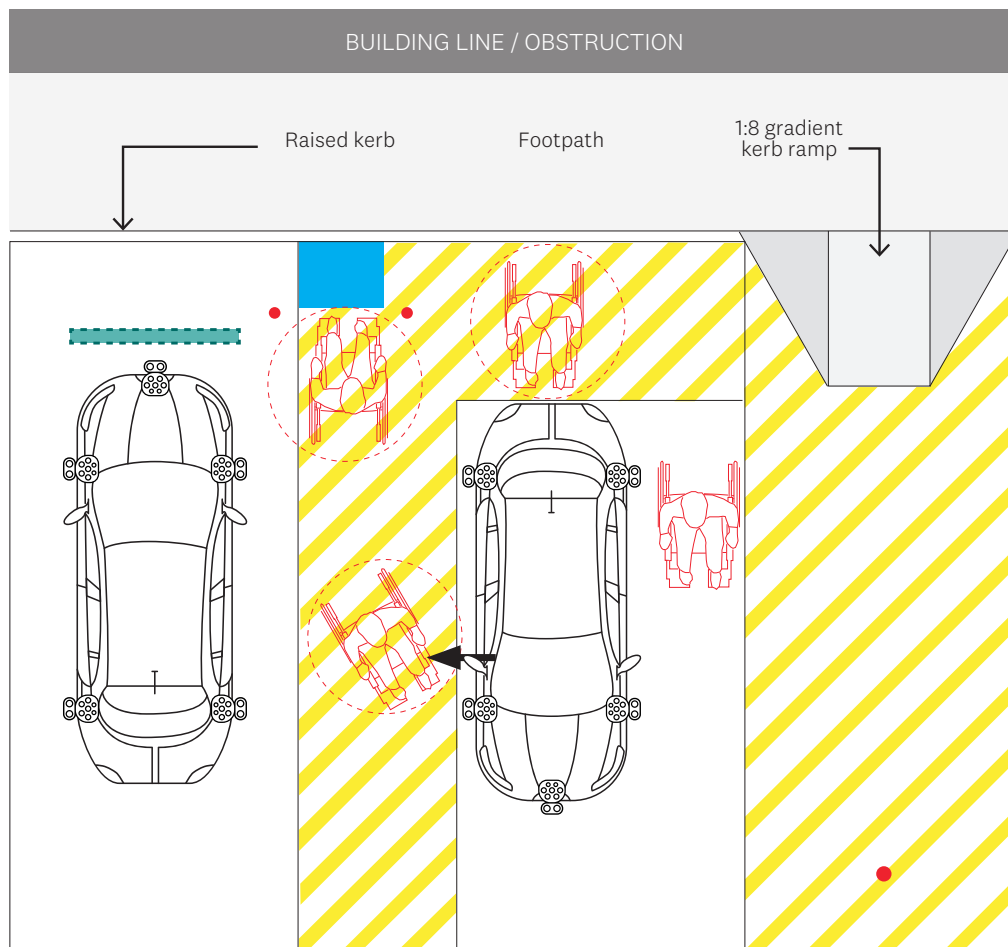


Figure 12: Raised kerb edge with footpath - option 3

Note: for full dimensions refer to figures 1, 2, 3 and 4.





Section 3: Charging space identification

3.1 Space identification

Each charging space shall be identified on the ground surface by means of Sign Type 1. Sign Type 2 shall be located in front of the accessible charging space. Refer to Figure 16.

Sign Type 3 shall be located in front of the charging spaces as determined by each council. Refer to Figures 16 and 17.

Sign Types 2 and 3 shall be located in front of each charging space with the bottom of the sign located no less than 2200mm above the ground surface. Signs that overhang a footpath or cycle path shall be set not less than 2500mm above the level of the footpath or cycle path.

Where a kerb is present, signs shall be located back from the face of the kerb not less than 300mm, nor more than 5m.

Signs shall not be installed within the clear zone of an accessible parking space.

When installing signs, care should be given to the position of the sign and post in relation to bollards and other signs. Signs should be positioned such that a 1000mm traversable space is available for pedestrians.

When installed on or near a walkway, sign placement shall not restrict a walkway to less than 1000mm width.

The accessible charging spaces need not be identified with the international symbol of access so as to restrict use of the charging space only for people with a disability.

Refer to Figures 18 and 19 for the location of the signs within each charging space.

3.2 Space delineation

Pavement markings to identify the charging spaces shall be blue and shall have a slip resistant surface. Raised pavement markers shall not be used for space delineation.

Pavement markings to identify the clear zone of an accessible charging space shall be installed in accordance with the requirements for the shared zone of an accessible parking space set out in AS 2890.6:2022.

All pavement markings shall conform to the slip-resistance requirements of Clause 2.3. Refer to Figures 18 and 19 for pavement marking.

Figure 13: Sign type 1



Figure 14: Sign type 2



3.3 “Priority Bay Use Last” designation

(adapted from the US Access Board: Design Recommendations for Accessible Electric Vehicle Charging Stations, November 2022)

The Australian Disability Parking Scheme (ADPS) includes an Australian Disability Parking Permit, which is recognised nationally. It also establishes nationally consistent eligibility criteria and national minimum parking concessions to help reduce the barriers for permit holders. State and Territory Governments are responsible for the management of the ADPS. As EV charging stations typically have limited charging spaces, reserving one space as prescribed in the ADPS is likely to result in either underutilised chargers or disregard of the controls put in place to provide for permit holders. At the time of this publication, just one DC charging

station in Australia is known to be designed with accessibility features. The “use last” approach seeks to ensure EV charging spaces are designed with accessible mobility features but do not require that the charging spaces be reserved exclusively for ADPS permit holders. The approach invites drivers to be sensitive to the needs of others and calls on the EV community to cultivate a culture of care. People without ADPS permits are permitted to use accessible ‘Priority Bays’, but only when all other bays are full. The introduction of Priority EV charging is designed to enhance awareness whilst encouraging social responsibility, EV charging etiquette and respect for others. If successful, the provision of Priority bays (which are not restricted to permit holders) may see a higher percentage of EV charging infrastructure designed and installed with accessible mobility features.

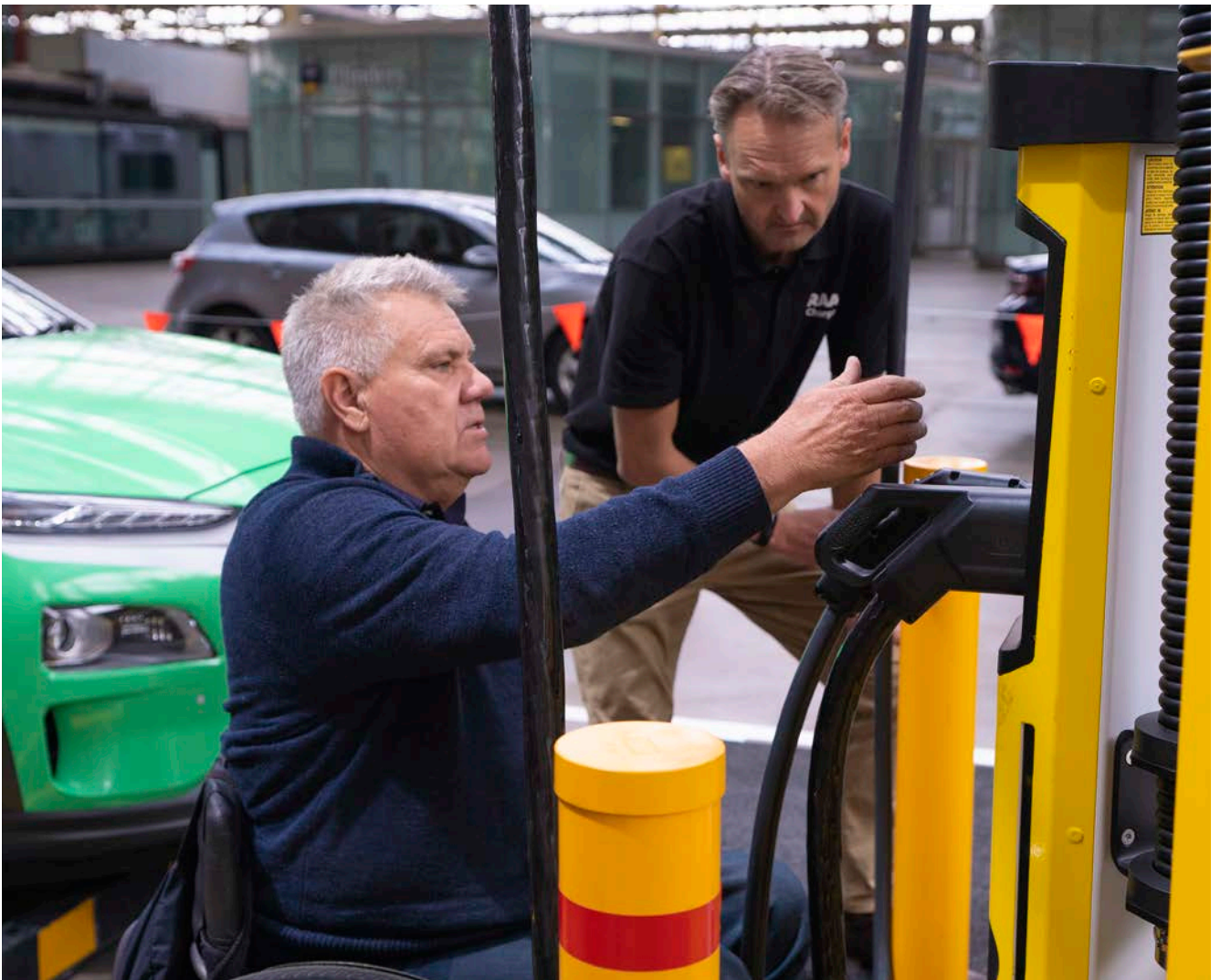


Figure 15: Sign type 3



**Parking
Controlled Option**

EV Bay Option

EV Bay ONLY Option

Figure 16: Sign type 4



Figure 17: Sign type 5



Figure 18: Line marking and symbols - 2 space

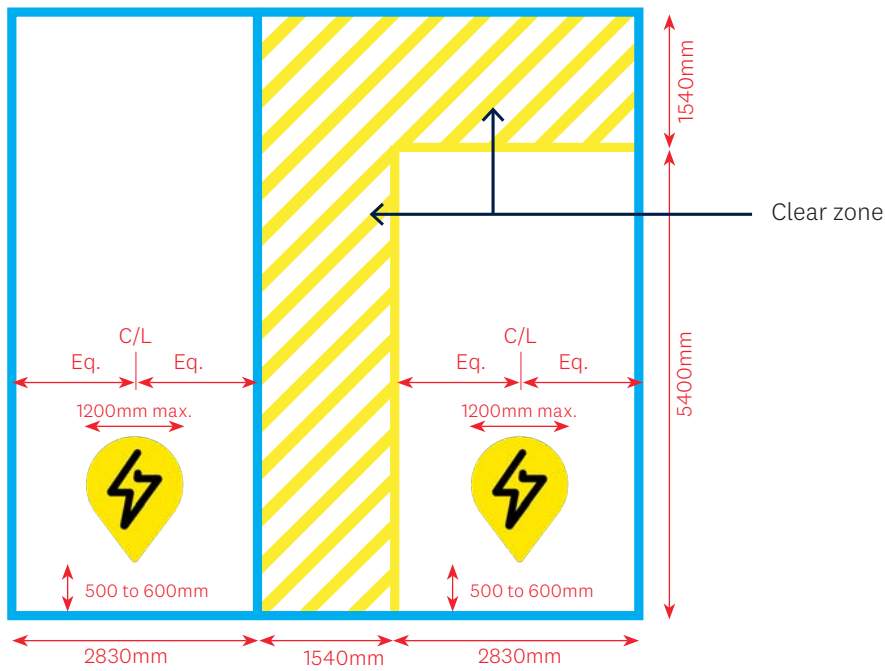
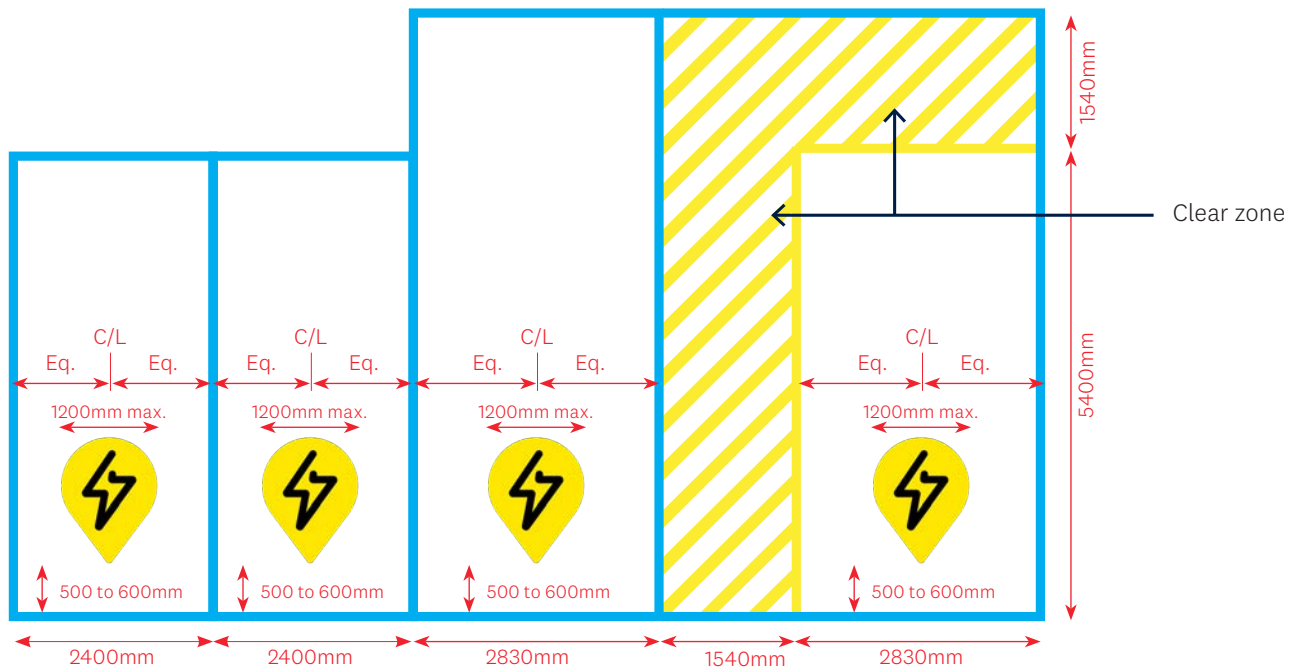


Figure 19: Line marking and symbols - 4 space



Appendix A: Provision of features for people with disabilities

A1 General

The purpose of this commentary is to explain the various requirements of this Guideline for the provision of accessible charging spaces for people with disabilities including how and why those requirements have been specified. People can be faced with a range of issues and barriers with respect to the usability of chargepoints. Individuals with different (For example physical, sensory and/or cognitive) impairments and needs can experience different barriers to using chargepoints, including those related to dexterity/strength, access and comprehension. People can also experience a combination of these impairments. The physical design of a chargepoint and its components should therefore take into account the range of needs of users, including disabled people, in order to achieve inclusive design.

The placement and positioning of a chargepoint has a significant impact on the accessibility of the chargepoint. Users including disabled people should be able to access the various components of the chargepoint such as the charging cable, the charging socket-outlet and any screen or visual interface or payment terminal installed on the chargepoint. This should include positioning the chargepoint so that it is accessible for users and not be obstructed by obstacles that would create barriers to users such as wheelchair users or users of other mobility aids to access the chargepoint.

People can be faced with a range of issues and barriers with respect to the usability of chargepoints.

The charging socket outlet and any section of a visual interface or payment terminal requiring user input should be within accessible reach.

A height of 1250mm above ground level is recommended. A display screen not requiring user interface may be situated above 1250mm, however care should be taken to ensure the display is legible for users of all heights having regard to the glare and reflections uniquely present at each installation.

Additionally, the placement of a chargepoint, sign or bollard should not obstruct or block movement past the chargepoint or access to other amenities or destinations near the chargepoints for other users of the public realm, including those with disabilities, those with prams or pushchairs, or those who need more space for other reasons. The cumulative impact of the chargepoint and existing obstacles in the public realm should be fully considered.

A2 Accessible EV chargers

Unlike petrol stations where an attendant may be available to assist with refueling vehicles for drivers with disabilities, EV charging stations will in most cases be unattended. Thus, it is important that EV charging stations be sufficiently accessible to allow independent use by drivers with disabilities, including people who have limited or no hand dexterity, limb differences, or upper extremity amputations and use adaptive driving controls.

Two aspects of accessibility need to be considered:

1. Accessible mobility features

A reasonable number of EV chargers must have physical access for people who use mobility devices, such as wheelchairs, scooters, walkers, and canes. Accessible mobility features primarily concern the size of the vehicle charging space, providing clear access aisles and how and where the chargers are installed.

2. Accessible communication features

All EV chargers should have accessible communication features and operable parts. This enables EV chargers to be used by people who are deaf or hard of hearing, little people, and other people with disabilities who do not need accessible mobility features (like access aisles) to use an EV charger.

Please note this Guideline does not address the accessibility of the charger itself but only the charging stations.

Accessible paths

Where possible, the charging stations should be connected to an accessible pedestrian walkway. The technical requirements for accessible paths of travel can be found in AS 1428.1, including walking surfaces, kerb ramps, and ramps.

A3 Accessible mobility features

Taking into consideration the results of the RAA EV Charging Station Trial and the accessible provisions specified AS/NZS 2890.6, the two vehicle charging stations specified within this Guideline have been designed to provide:

- a two space charging station with an overall minimum width of 7200mm and a length of 6940mm (which utilises the width of three minimum dimension car parking spaces)
- a marked 'clear zone' between the two car spaces of 1540mm
- a marked 'clear zone' at the front of one of the two car spaces of 1540mm
- a charger on the same level of the charging station and positioned for an unobstructed front and/or side reach
- a ground surface with a maximum gradient and crossfall of 1:33 (1:40 if the ground surface is not bitumen).

These mobility features allow sufficient space for a person who uses a mobility device to exit and manoeuvre around the vehicle, retrieve the EV connector, and plug the connector into the vehicle charging inlet. Since EVs do not have a uniform vehicle charging inlet location, a larger vehicle charging space is needed to manoeuvre around all sides of the vehicle.

Thank you to our partners and volunteers for their support

Businesses

Tonsley Innovation District
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ParaQuad SA

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