COMPETITION: **Electric vehicle charging for public spaces: real-world demonstrators**

PROJECT TITLE

Scaling On-Street Charging Infrastructure (SOSCI) Project No: 34290

Periodic Report

Period: Q9

‘Stage 5 Report - EVCP Inclusive Design Guidance Notes and Case Studies with Supporting Information’

COMMERCIAL RESTRICTED

Date: 18th January 2022

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Circulation: All Project Partners

Monitoring Database

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1. INTRODUCTION

This report is one of a series prepared under the SOSCI project.

The aim of this report is to provide an overview summary of the guidance provided in the earlier project reports from Stages 1 to 4, for the planning, design and installation of public charging facilities for local communities

By way of providing an overview to the challenges of the disabled driver, these photos from the trial are a good indication.

1.1. Foreword

This project for development of guidance standards for EV charging facilities is supported by funding from OZEV via Innovate UK, and forms part of the Scaling On-Street Charging Infrastructure (SOSCI) project led by Cybermoor Services Ltd.

This report has been prepared by Access Consultancy Support.

1.2. Executive Summary

The aim of this report is to provide an overview summary of the guidance provided in the earlier project reports from Stages 1 to 4, for the planning, design and installation of public charging facilities for local communities, as well as to highlight current proposals for best practice solutions for EV charging facility installations, and demonstrate with the aid of case studies how such solutions may be applied to existing sites to support development of facilities with the potential to be more inclusive for all users.

The report does not give consideration to the programming of EVCP development, availability of power supply from Distribution Network Operators (DNOs) or any requirement for wayleaves to support installations.

Issues around inequality of access to EV charging are now becoming more recognised by Government and local authorities. Local authorities have been advised to identify options for chargepoint locations for residents who are unable to charge at home due to lack of off-street parking, and where on-street provision cannot be easily achieved.

The provisions discussed aim to service the needs of such local residents, by adopting an inclusive approach to accommodate residents with differing needs such as due to impairment or as parents with young children.

The following sections of this report give consideration to issues that can have implications for provision of local EV chargepoint use by such residents, and makes reference to the earlier stage reports produced for this project where further relevant information, guidance and recommendations can be found. The guidance and recommendations from this project are also expected to have wider relevance to EV Charging infrastructure generally.

2. INCLUSIVE DEVELOPMENT STRATEGY FOR EVCP PROVISION

2.1. Initial Planning and Site Assessment

Considering the current aims of many local authority providers to identify locations where public chargepoints can more easily be provided, it is important that the Stage 4 Guidance is applied to site selection and site planning, giving consideration to:

- Local topography
- Demographics,
- Application of local planning policies to EV charging bays provision
- Implications of space requirements for EVCP bays
- Equality of provision

Given that there will be a likely need to use existing sites currently available and possibly already used for parking, there remains the need to consider how safe access is or will be facilitated and maintained, both to the site and within the site, for people with impairments and persons with young children. As advised in the Stage 4 Report:

R1. Ensure accessibility to and within site is suitably assessed for safe use by disabled and elderly persons, and for parents with young children.

This will generally require an access audit of site and routes by appropriately qualified and experienced personnel, if such auditing has not previously been carried out and within a recent timescale to ensure the continued relevance of any reporting.

2.2. Site Layout Planning

Access within the site should as far as possible provide separation between pedestrian and vehicle routes and minimise any requirement for pedestrians to cross the vehicle routes to access the vehicle bays: this may involve identifying specific pedestrian routes and on-site crossings by either a change in surface or by surface demarcation with appropriate ground marking (i.e. white lining) where changes in levels and surface finishes may not be appropriate.

As discussed in the Stage 4 Report, once the initial number of Active and Passive EV bays has been decided for insertion into existing parking sites, and relevant demographics and local policies have been considered, the location planning of the EV charging infrastructure and bays within the site should preferably be developed for sustainability of the proposed installation. The report advises:

R2. Where local policy requires installation of x% active EV bays and y% passive bays, install at least 5% of all bays as active EV bays designed as 'Inclusive Active Bays' for use by all EV users, with at least one or 5% of the inclusive active bays signed as a Blue Badge Holder-EV Bay, whichever is greater; unless relevant demographics or local knowledge and experience indicates a higher level of provision is required to be accessible for disabled persons, such as may be the case for some healthcare facilities.

The application of currently proposed model layouts for accessible BBH-EV bays as 'inclusive active EV bays' can offer sustainable solutions for initial car park development for EV charging; such as where percentages of the overall parking provision are to be converted to active and passive bays.

The Stage 4 report advises as a minimum:

R3. At least one 'inclusive EV charging bay' is provided within any car park with up to 20 parking spaces.

R4. In car parks with 20 or more spaces, up to 5% of all parking bays are installed as active inclusive EV charging bays and 10% are installed as passive 'standard EV bays', of the types described later within this report.

R5. Where 5 or more EV charging bays are provided, at least one inclusive EV charging bay should be designated for use by 'Blue Badge Holders Only'

As discussed in that report, provision of a higher number of inclusive EV charging bays as part of the initial installation of active EV bays, enables all bays to be available for charging of any EV vehicle and avoids later disruption to increase numbers for Blue Badge Holders EV Bays when the passive provision is later developed to provide active charging bays for other non-disabled users. The report also provides guidance and recommendations on provision and spatial layout requirements for standard (non-disabled) EV charging bays, and considerations for equality of provision for parenting use, and for WAV users who require additional space for vehicle access ramps or hoists when entering or exiting the vehicle in their wheelchair or scooter.

3. INCLUSIVE CHARGEPOINT DESIGN

3.1. EVCP Bay Layout Planning

Planning the site layout for EVCP bays will likely vary between sites, the available space, and the pedestrian and vehicle access within the site.

The Stage 2 output provided a range of charging bay models for inclusive EV charging bays based on pairs of bays sharing a single chargepoint installation. The Stage 4 Report also provided some examples of proposed model layouts for standard EV charging bays for non-disabled users.

The main issues to address for accessibility and inclusive design of EV charging bays include having clear space to:

- enter and exit vehicle
- move around vehicle
- collect any charging cable required
- access the chargepoint, and
- complete connection between vehicle and chargepoint without the cable becoming a trip hazard

All this needs to be possible to do safely and without obstruction to either the vehicle operator or anyone else who may be a passenger or someone passing by the location.

The guidance provided during Stage 1 of this project aimed to address each of the above issues, based on ergonomic research commissioned by the Department of the Environment, Transport and the Regions (DETR) in 1999[1] which was later informed by CAD (computer aided design) and trials data for the development of the BSI 8300 Code of Practice for the manoeuvring of wheelchair and scooter users at the side of vehicles and when turning through 90° and 180°; as referenced in BS8300-1: 2018 for External Environments and BS8300-2:2018 for Buildings. Stage 1 of this project referred to the current BS8300 Codes of Practice for the manoeuvring space required by persons using mobility aids at the sides of vehicles.

Stage 2 considered the reach requirements for ambulant people with mobility impairments and wheelchair users at chargepoints based on the data from research trials provided in the current BS8300, and location of the charging device and protection bollards relative to the site and charging bays.

[1] A survey of occupied wheelchairs to determine their overall dimensions and weight: 1999 Survey by the Transport Research Laboratory, dft_mobility_507587pdf.

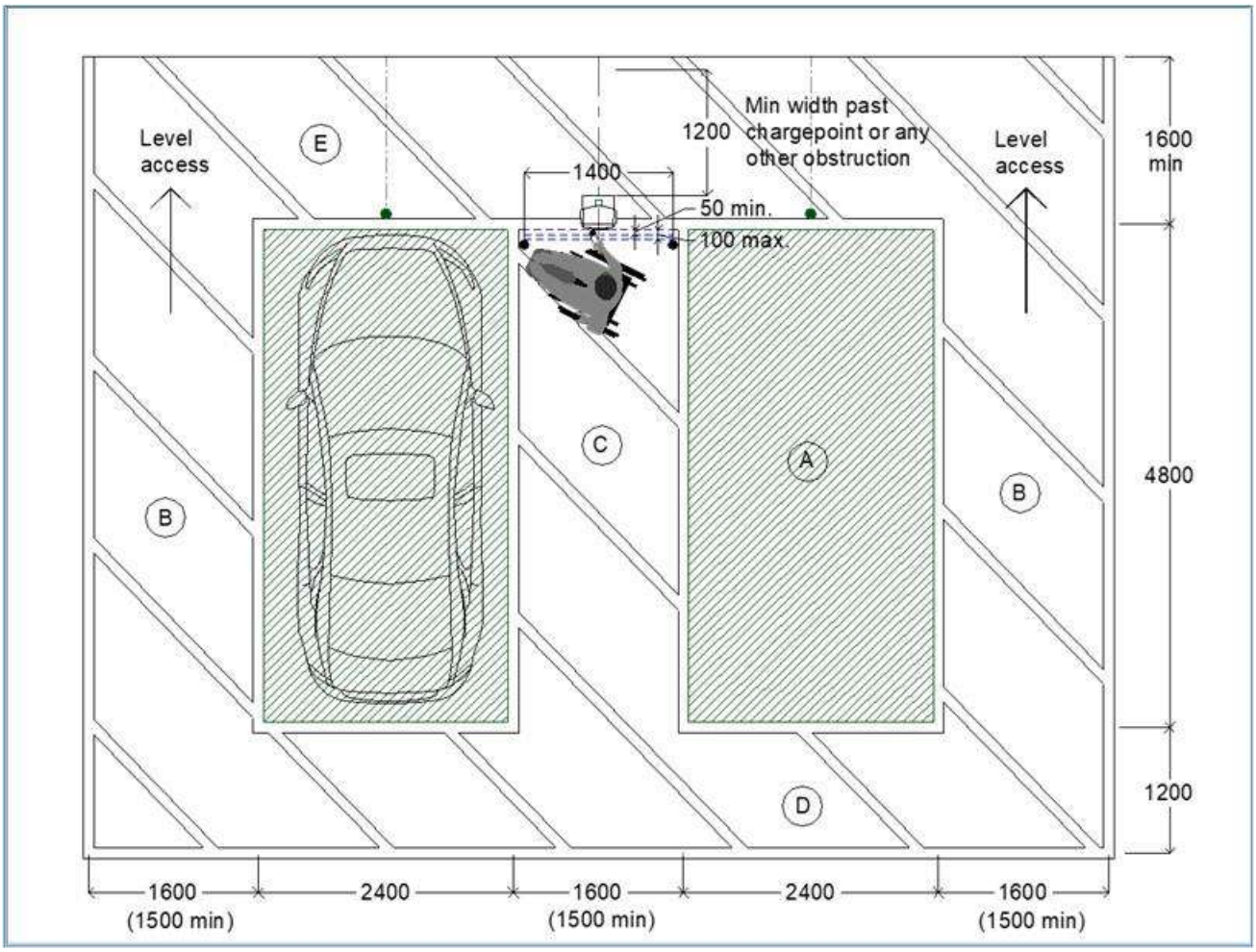


Figure 1: St2 Diag 2B1a: Accessible BBH-EV Bays

with level access cross-aisle with two front sockets (updated version from Stage 2 Report following User Trial)

The above diagram demonstrates the advised spatial requirement for inclusive access around the vehicles and to the EV chargepoint based on the Stage 1 and Stage 2 development informed by this project's User Trial data and observations. Alternative layouts are also provided within the Stage 2 Report for different site configurations where vehicle bays are set at 90° to the kerb edge in front of a footpath or border, and for different chargepoint arrangements.

The advised reach height for cable connection and interaction with the chargepoint based on the projects User Trial data is also compliant with the guidance on reach ranges and viewing heights advised in the current BS8300 Codes of Practice; as demonstrated in the following diagram. The Stage 2 diagram showing proposed protection bollard arrangement at chargepoint is also provided, for bollards located between 50mm and 100mm forward of the charging device when measured along the centre aisle.

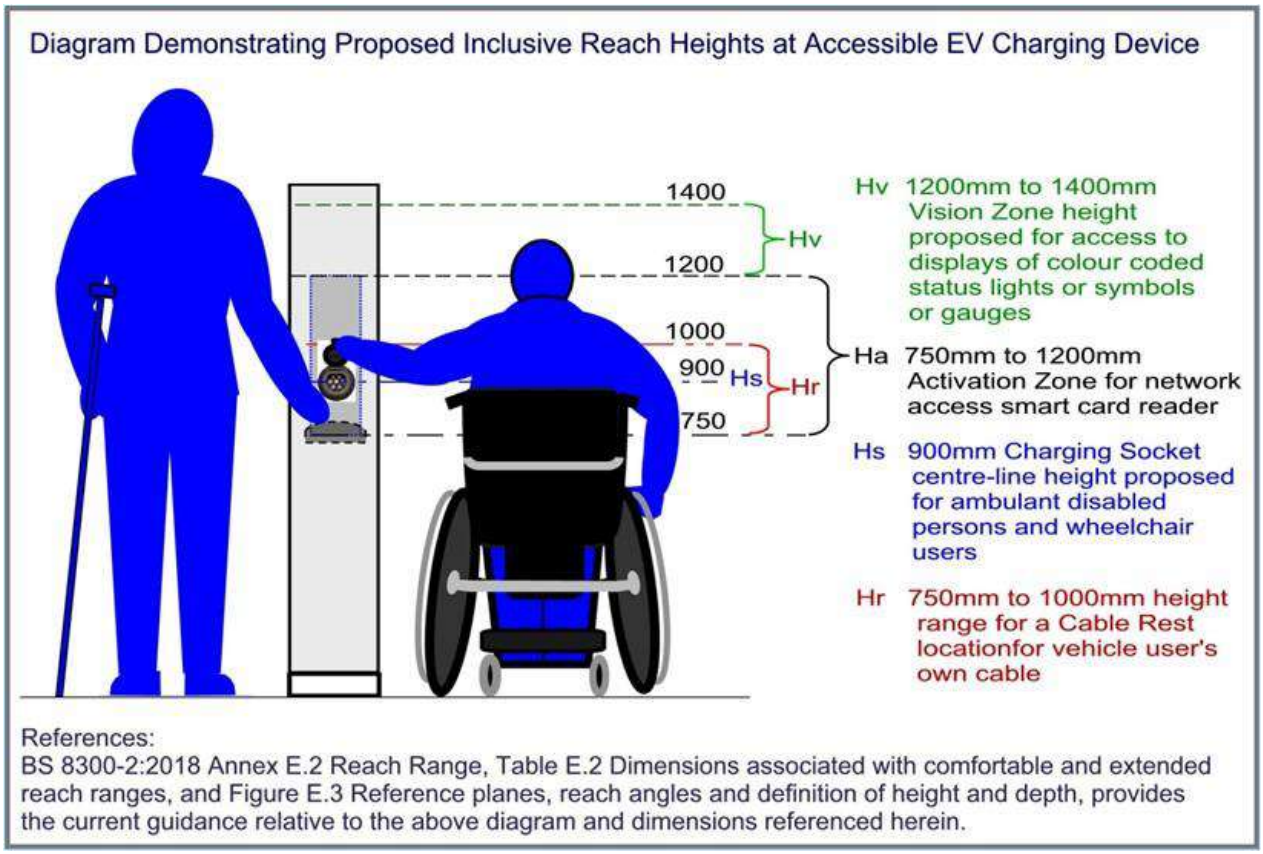


Figure 2: St.2 Diag 2c: Diagram illustrating proposed inclusive reach heights and zones

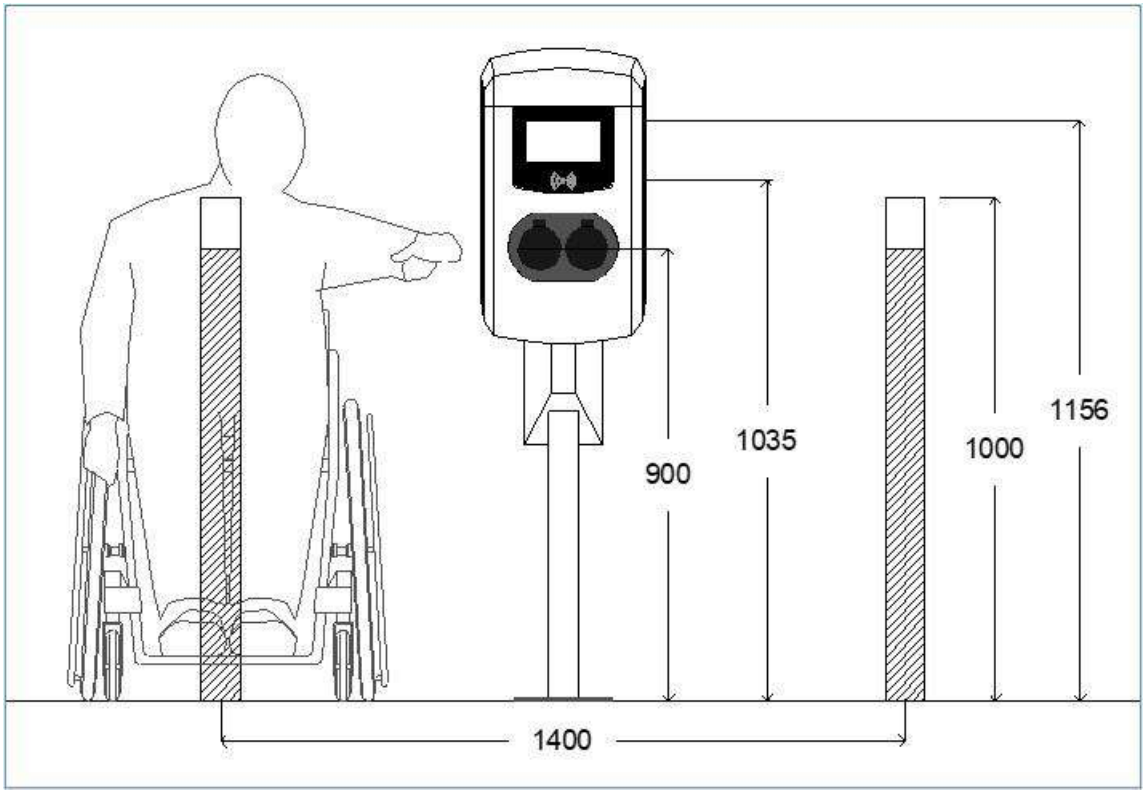


Figure 3: St.2 Diag 2d: Demonstrates Protection Bollards Arrangement at Chargepoint

3.2. Charging Device Design and Charging Process Parameters

The Stage 3 Report reflected on the outcomes of the User Trial Report, from which guidance and recommendations were developed in response to issues requiring improvement for consumer chargepoint use.

The issues identified for further consideration by designers and manufacturers included: ease of recognition of chargepoint status; access to chargepoint networks; design of charging devices to support use by people who can experiencing difficulties with reading information displays as a result of ageing or other impairment; difficulties of interacting within environments such as with chargepoints by persons with impaired mobility; and contrasting bollards and chargepoints to their backgrounds for people with sight loss.

Proposed improvements to chargepoint features to support ease of use, include the provision of a cable rest and use of the chargepoint as a leaning post, possibly with handhold provision, to facilitate support for individuals with impaired mobility.

Provision of effective signposting of EV charging bays and any cost associated with parking and charging should be clearly displayed on approach to site location, similar to current practice at liquid fuel stations.

Some improvement is also advocated in the way the charging procedure is managed between the electric vehicle and the chargepoint when they are connected, for ease of consumer use of the charging activity and to provide the consumer with relevant information on charging status and cost via the vehicle's on-board systems and in-car displays. Such improvements require involvement of the EV manufacturers as well as the chargepoint providers.

As part of EV development, the potential for vehicles to detect and avoid impact with a chargepoint or bollard is also considered to be an important standard function to provide, as this would potentially negate the need for protection bollards that restrict access around chargepoints for some people.

The Stage 3 report also advised Government interaction and engagement with the Motor Vehicle industry to encourage improvements for consumer use of EVs and charging infrastructure, including standardisation of chargepoint status designation and indication, as well as making the cost per kilowatt-hour readily visible on approach to EV charging site entrances.

It is hoped that the information provided and recommendations will inform and empower designers and manufacturers to have greater awareness of the issues and the implications of their design and manufacturing decisions.

4. CASE STUDY REVIEW OF EXISTING INSTALLATIONS

The following section of this report considers existing EVCP sites and the options that can be considered to improve the accessibility of the chargepoints where best practice may not easily be achieved.

4.1. Exemplar Installations of Good Practice

4.1.1. Saltwell Park EVCP Bay: Designed as an Inclusive Facility in 2013

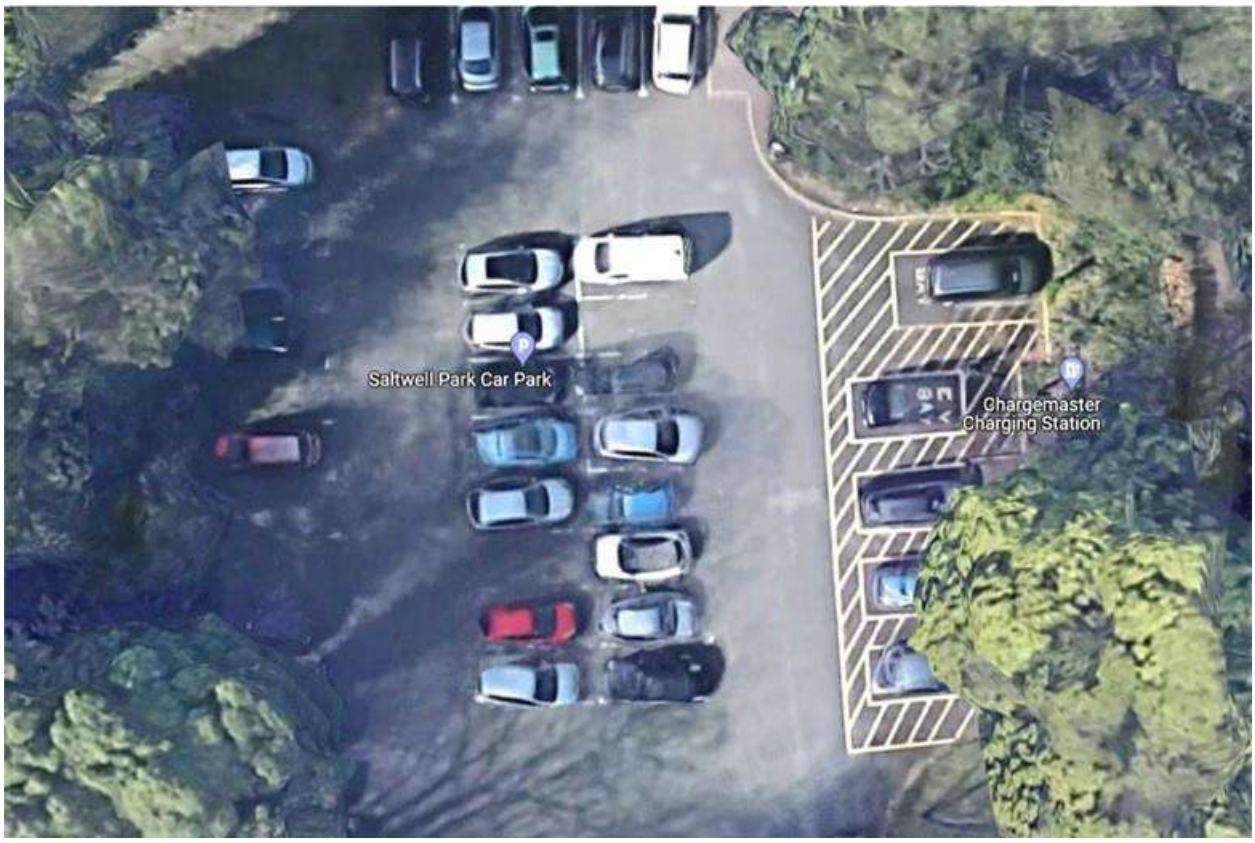


Figure 4: Area of Saltwell Park car park

Shows a row of 3 standard BBH Bays with WAV Bay at top and the EV Bay second space from top right (from Google Maps, 2021)

The EV Bay (as pictured below) provided level access all around the vehicle bay and charging equipment and was signed as 'This space reserved for electric vehicles'. Consequently the facility was accessible to use by anyone with a plug-in vehicle including BBHs but not reserved as a BBH bay.

This compromise solution previously advised on other projects, and first achieved in Saltwell Park Car Park, Gateshead in July 2014, was the provision of a Universally Accessible EV Charging Bay within a row of Accessible BBH Bays (as shown in the previous image and below) designed to best practice standards, at that time satisfying BS8300 and IET Guidance.

Figure 5: Level access EV Bay & Signage

Bollard sign identifying bay reserved for electric vehicles, with WAV bay on left of EV bay

The Saltwell Park's Universally Accessible EV Charging Bay can be accessed by any EV car driver including persons with impaired mobility, representing sustainable provision that can easily be re-designated as a BBH-EV Bay in response to changing needs. The application of currently proposed model layouts for accessible BBH-EV bays as 'inclusive active EV bays' can offer sustainable solutions for initial car park development for EV charging; such as where percentages of the overall parking provision are to be converted to active and passive bays.

This chargepoint could also potentially be used by any plug-in vehicle in the adjacent enlarged parking space, reserved for WAV (Wheelchair Accessible Vehicle) parking, which also meant that any future Electric WAV could also plug-in to the twin socket charge-point.

The dimensions and layouts discussed above in section 2 of this report, developed during Stages 1 and 2 of the project for an Inclusive Access EV Charging Bay for Blue Badge Holders, represents the current proposed guidance developed and updated from the earlier Gateshead design model used for the Saltwell Park installation; an installation that was previously based on the application of the existing BS 8300:2009 guidance and the incorporated research data at that time for access to car park ticket machines and the IET Code of Practice 2012[2].

[2] IET Code of Practice on Electric Vehicle Charging Equipment Installation, Institution of Engineering and Technology 2012

Figure 6: WAV Bay

Shows a rear-access Wheelchair Accessible Vehicle adjacent to the Saltwell Park Universal Access EV bay.

The Saltwell Park WAV Bay (located alongside the EV Bay) was just one of many purpose-designed bays that have been provided around Gateshead since 2010 at sport and leisure facilities, schools and other public buildings, and within the town centre Trinity Square Retail Development.

Figure 7: demonstrates clear access all around vehicle and chargepoint

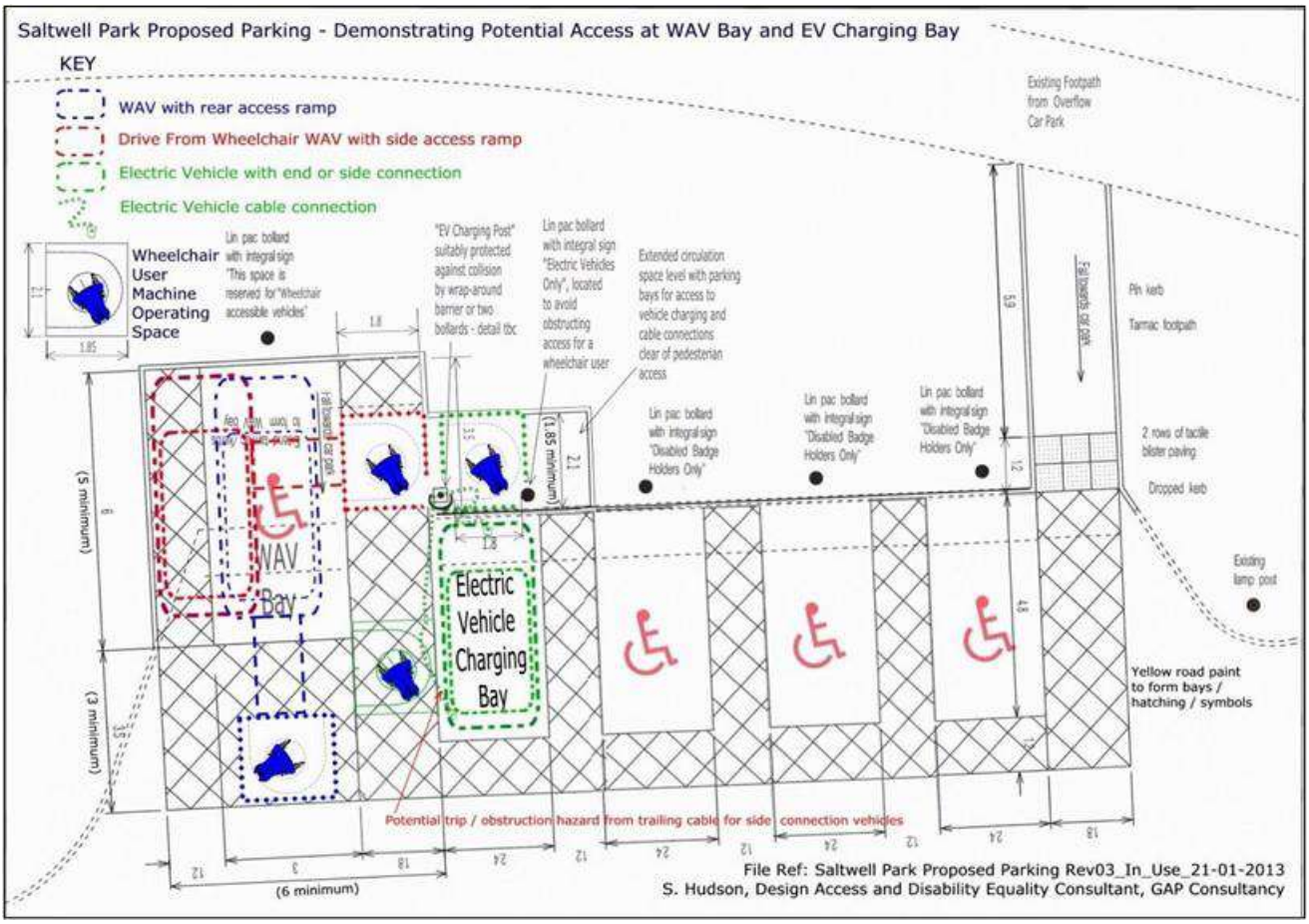


Figure 8: Saltwell Park layout drawing (WAV Bay, EV Bay and BBH parking)

Where possible WAV bays are sited to avoid or minimise the potential for conflict and risk from passing vehicles; as it's not always possible within existing car parks to accommodate deeper or wider parking bays to enable transfers in and out of such vehicles clear of the vehicle route.

The space provided for WAV vehicles in the above layout enables use of parking bay by side access vehicles as well as rear access vehicles that use a fold-out ramp or platform for entry and exit at the vehicle by wheelchair users or mobility scooter users. This layout optimised the space required for wheelchair access to the chargepoint for the wider side access also required by side entry WAVs. The depth of the WAV bay was also sized to accommodate the larger WAV vehicles that can exceed 5m length, as well as providing space for wheelchair users manoeuvring on and off their vehicle access ramp clear of the vehicle route; and responded to relevant guidance and data in the current BS 8300:2009 at that time. The spatial requirements for WAV parking and WAV-EV charging bays as demonstrated in the above model layout developed for the Saltwell Park installation remain applicable for future installations and comply with BS300-1:2018 and IET CoP 2020.

One further point to note: the foregoing development guidance for bay layouts only represent a two-dimensional representation of the issues for accessibility of EV Charging facilities, and although reach requirements to operate charging equipment by persons with limited reach ability have been considered during development of these layouts, additional issues also required consideration in respect of the equipment height. These issues are outlined along with recommendations in the User Trial report, and are discussed further in the Stage 3 Report, with further recommendations provided for the future design and manufacture of equipment for EV charging.

4.1.2. Sniperley Park and Ride, Durham, DH1 5AA

Figure 9: EV charging bays prior to User Trial event

The image above shows EV Charging installations at Sniperley Park and Ride in Durham City. It was the chosen location for a User Trial conducted on 6th October 2021. This site offered the highest level of inclusive access of the twelve sites visited during the project, of which seven of those sites were operational at that time.

The site provides three charging devices, incorporating level access from the vehicle bays to all charging units, where side access aisles are provided with good circulation width. The existing layout presented a realistic opportunity for mobility impaired service users including wheelchair users to alight from a vehicle and be presented with a reasonable chance of accessing the charging device. The above image shows a twin-socket Alfen device operating on the MER network, recessed beyond the bay by 400mm with the socket centre-line height at 1065mm above the vehicle bay and aisle surface.

Although the protection bollards location relative to the charging device may affect physical accessibility for some larger powered wheelchairs, notwithstanding the reported issues around socket height, screen legibility and printed information, this installation could be markedly improved with some tweaking of the device position and bollard arrangement.

There is also the potential that some users may have difficulty connecting between the chargepoint and their vehicle with a standard 5m cable length, with the charging device located so far back from the vehicle bay.

Figure 10: shows a single socket MER Alfen chargepoint

The above image shows one of two single socket units at Sniperley Park and Ride site. Note that the unit is positioned towards the right hand edge of the vehicle bay, requiring a mobility impaired service user to position a vehicle such that it allows adequate space between the vehicle and chargepoint to facilitate access to the charging device.

The socket height above bay level is 940mm and the unit is recessed by approximately 40mm behind the bollards to the left of the side access aisle. Here again, notwithstanding the reported charging device user accessibility issues, this arrangement provides the potential for use by some people with impaired mobility. However, as outlined earlier above, some adjustment to the position of the unit and bollards is required in order to improve the accessibility characteristics.

For such single socket locations with the level access potential of this site, the location of bollard protection similar to that shown would likely be more appropriate with a side-socket or rear-socket charging device; providing that the location of bollards relative to the chargepoint allowed for close approach to interact with the chargepoint and the operational status can be easily recognised without leaving the vehicle.

4.1.3. Consett Leisure Centre, Medomsley Road, Consett, DH8 5HU

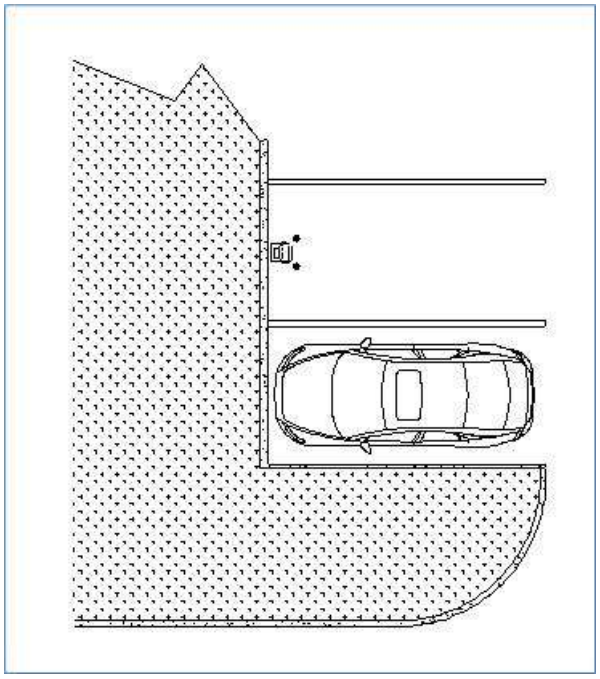
Figure 11: MER-Alfen twin socket chargepoint in vehicle bay & Pre-installation

The above image shows one of the two charging units within the car park at the Consett Leisure Centre. Apart from the Sniperley site, this was the only location in which the charging devices were installed at bay level; and in this case within the bay and in front of the kerb to the grassed border.

The earlier image (right) shows how the parking area appeared before the planting of young trees and installation of EV charging. Although we are unable to confirm which happened first, the location of the chargepoints within the bay area may have been a consequence of ecological concerns rather than charging bay planning.

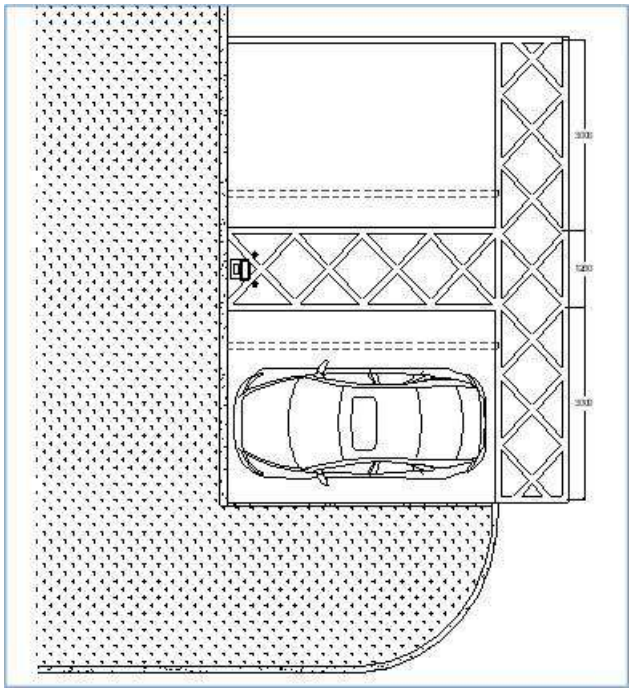
However due to the charging device being located within a vehicle bay it is likely to be inaccessible to some mobility impaired people, e.g. wheelchair users, when the bays adjacent to the charging unit are occupied by vehicles.

At the time of the site visit, we were advised there was no potential to make physical changes to the installation other than possibly re-marking the three standard size vehicle bays to provide two accessible EV bays with a shared access aisle as demonstrated in the following diagrams. However this did not address the socket height above ground level, which in this instance was 1065mm, and subsequent data produced by the User Trial strongly indicated that a socket at this height would present with problematic accessibility for some disabled people. A remaining concern regarding the charging bays is there location in the furthest row of bays from the leisure centre entrance. As in the case of the Sniperley Park and Ride site, accessible EVCP bays should be located within 50m of the accessible entrance when associated with a building and its facilities; as required for accessible parking.

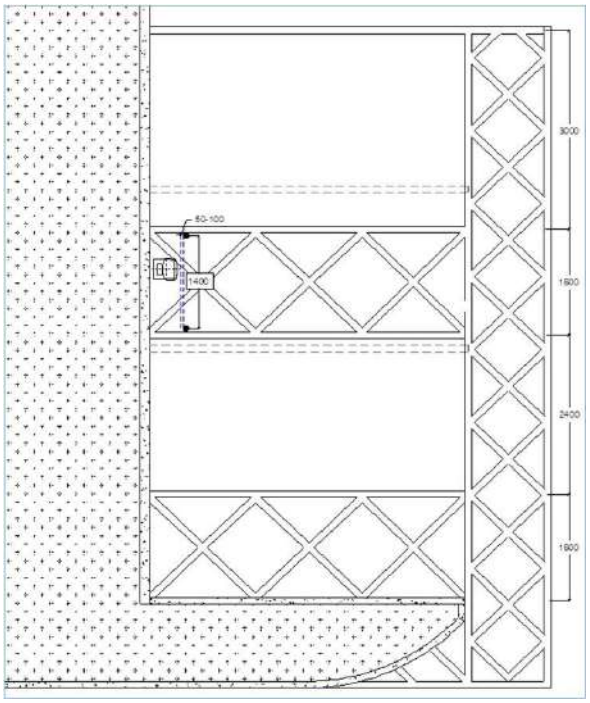


Current layout

Difference between the existing socket height and this project's proposed inclusive socket height at 900mm above bay level.



Two 3m wide bays sharing a 1.2m wide access aisle



Option: 1600mm wide access aisle either side of a 2.4m wide vehicle bay by extending the side aisle into the grassed area, and retention of the second bay of 3.0m width.

Figure 12: Existing bay arrangement and proposed alternative layouts

If this option can be provided the chargepoint protection bollards should also preferably be relocated at 1400mm centres and between 50mm and 100mm forward of the charging sockets. Ideally the chargepoint would also be relocated centrally within the width of the 1600mm wide access aisle, but this adjustment may be more difficult to achieve.

4.2. Examples of Bad Practice and Consideration of Potential Improvements

Bad practice generally results from inadequate consideration of current guidance for such installations, and can often be due to a lack of awareness or understanding of the guidance and the issues such guidance aims to address. However, what may be possible at any given site may not always be within the control of the facility designer or installer, who may often be restricted by such as local policies, site owner / operator constraints, on site access and use, and requirements to maintain a given number of vehicle bays; as well as restrictions on access to power supply.

The following examples are therefore reviewed and considered for remedial options that aim to redress such inadequacies of provision as far as may be practical, subject to any continuing site constraints.

4.2.1. Union Lane, Brampton, Cumbria, CA8 1BX

Figure 13: demonstrates difficult access to CMS-EO chargepoint

The location of this Charge My Street EO chargepoint, set-back within the grassed border at a level above the vehicle bay, made access to the side-facing sockets extremely difficult for a wheelchair user; and would also be problematic for other mobility impaired service users. The unit was recessed from the edge of the bay by around 460mm, which made it very difficult to insert and remove the cable from a socket located

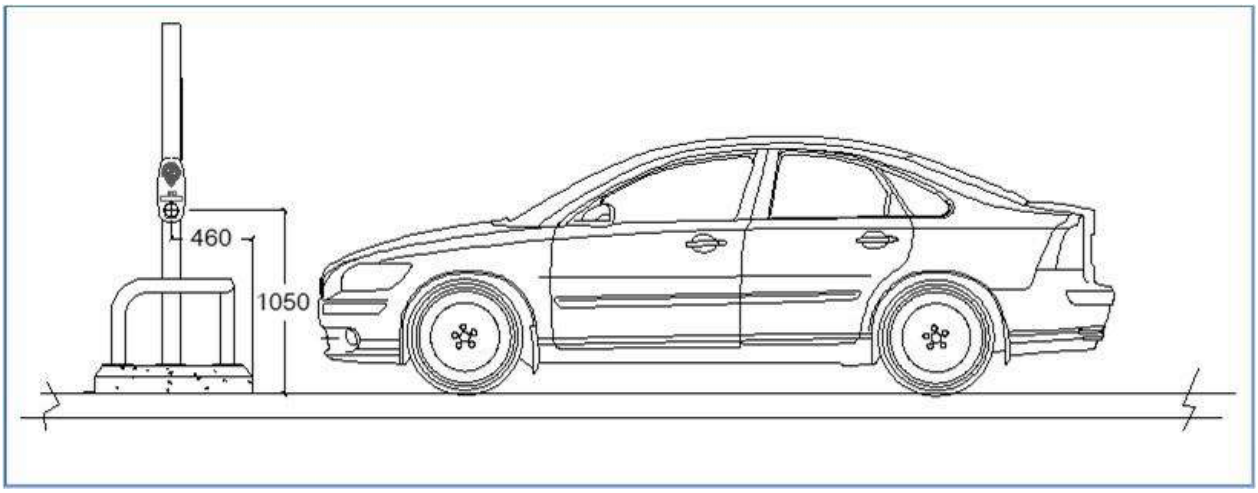
approximately 1050mm above the vehicle bay level on a raised concrete plinth with very substantial guarding.

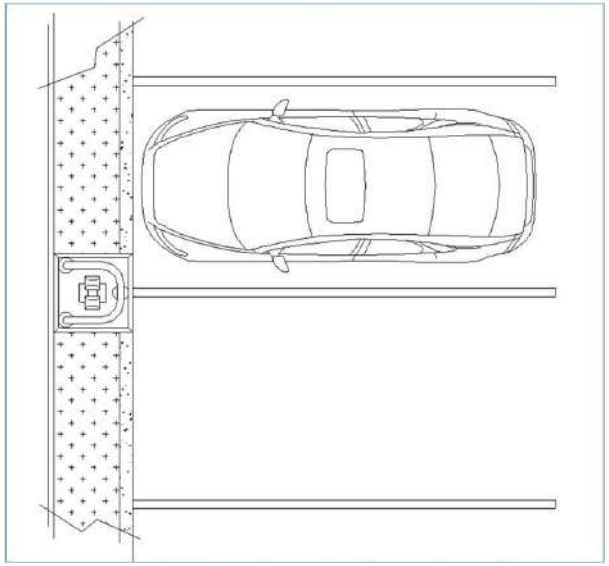
From the bay area it was not possible to read the instructions from a seated position for using the card reader, or to ascertain the status of the charging device indicated by coloured lighting that rim-lit the eo logo, which even on close inspection in daylight was difficult to confirm.

Front facing sockets would likely in this instance, have presented easier interaction with the charging device and the associated activities. It is important to note that if the standard-sized parking bay, within which the wheelchair user is located, had been occupied by a vehicle alongside his vehicle, the likelihood for access to and use of the charging device would have been severely compromised for the wheelchair user as can be seen in the above image. Also note that the wheelchair user was attempting to use the socket for the vacant bay, as his own vehicle took up all available space in the standard bay, making access to the charging socket for his bay impossible to reach.

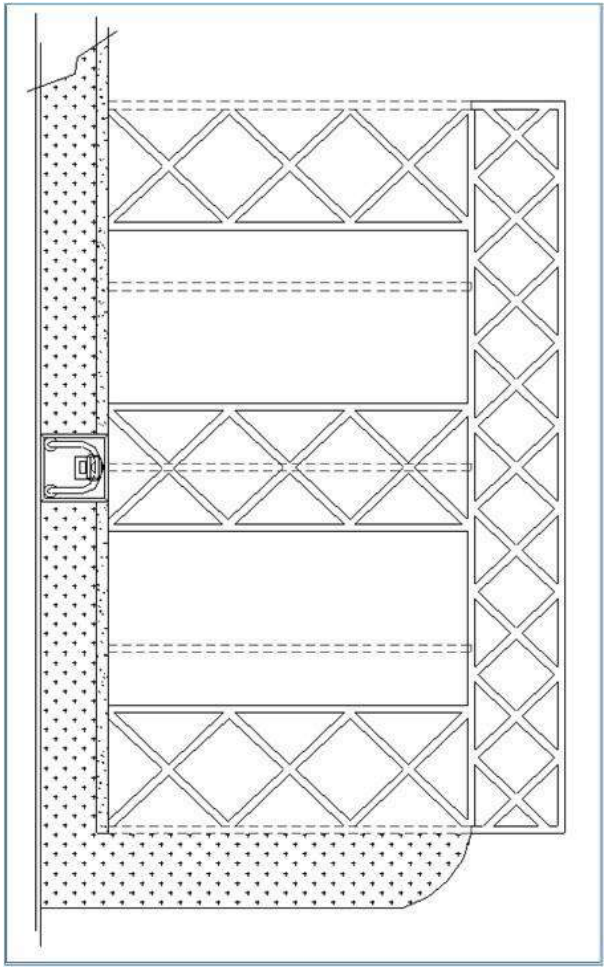
The following diagrams show the existing charging point and vehicle bay layout, followed by a diagram illustrating the impact on the parking provision when two inclusive access charging bays are installed, but with the charging devices turned to provide front-facing power outlet sockets. The result is a loss of two parking spaces with two inclusive accessible EV charging bays replacing four standard parking bays.

An alternative option is also shown where two standard parking bays are converted to a 1.6m wide access aisle adjacent to the chargepoint, and the remaining width of the original parking bays combined to provide a charging bay width of 3.2m. Additionally the chargepoints are relocated closer to the head of the bays with sockets facing the bays, preferably with sockets height lowered to 900mm. Similar to the Consett Leisure Centre proposed solution, although not fully achieving the advised best practice solution, a wider vehicle bay allows the driver to use their judgement on how best to position their vehicle to facilitate use of the space available. A further option would be to relocate the chargepoint and protection bollards within the head of the aisle. These options could also be applied to the Showfield site in Brampton.

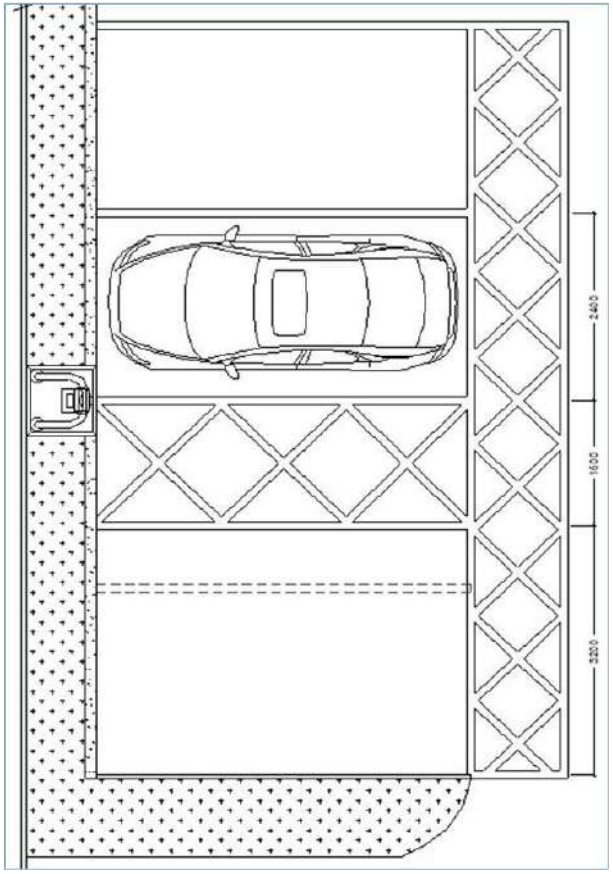




current chargepoint installation and charging bay layout



impact of inserting two inclusive access bays



alternative option with access aisle and wider charging bay

Figure 14: Layout Options and Space Required

4.2.2. Snowfield, Brampton, Cumbria, CA8 1NY

Figure 15: shows the chargepoint location in front of two parking bays

Similar conditions to those viewed at Union Lane, Brampton are encountered at the Showfield site in Brampton. At this location, the charging units were not yet operational and were recessed further from the existing standard parking bays by approximately 650mm. The socket heights were approx.1060mm above the bay level and as outlined for Union Lane, when another vehicle occupies the adjacent standard-sized parking bay as shown in the image above, there would be no opportunity for a wheelchair user to interact with the charging device. In fact, the majority of persons with impaired mobility would be prevented from exiting their vehicle when the adjacent bays were occupied.

Options for improved access to the charging bay and chargepoint are identified in the immediately preceding pages for the Union Lane site, which could also be considered here at the Showfield car park.

4.2.3. Consett Car Park, Albert Road, County Durham, DH8 5QU

Figure 16: shows chargepoints located in front of four parking bays

This site has two MER-Alfen front-facing, twin-socket charging devices that are recessed approximately 400mm from the bay edge with socket heights for the two units at approx. 1120mm and 1180mm above bay level. The units are each aligned between two bays, with two bollards utilised for protection purposes as can be seen in the above image.

Figure 17: shows location on Google Street View prior to MER upgrade.

When these parking bays are occupied, there is no access aisle to the chargepoint for such as a wheelchair user or a person using crutches, and most persons with impaired mobility would be unable to gain access between adjacent vehicles in these standard size parking bays.

In brief, and as a minimum, to provide for reasonable levels of accessibility at the above sites, it requires a change to the bay layouts to include:

- Insertion of a shared access aisle of 1600mm width (1500mm minimum);
- Relocating the charging units either closer to the bay edge or within the access aisle in front of the kerb with protection bollards located as shown on pages 7 and 8; and
- Lowering the socket heights to 900mm above bay level.

In regard to the previous Brampton locations there would also be potential need to replace the existing chargepoint guarding with more appropriately located protection bollards, and reconsideration of the charging device arrangement, to provide the face of the device(s) with charging sockets and status indication facing the vehicle bays and location of the service user.

4.2.4. Community Gym Hall, Tyne Willows, Alston, CA9 3HZ

Figure 18: shows the two wall-mounted Charge My Street chargepoints

The above images taken at this Alston site shows two wall-mounted, single socket EO devices. No individual bay markings are provided and as can be seen in both images, the surface conditions are not suitable for persons with impaired mobility, and may not be suitable for regular vehicle use in bad weather. The height to the centreline of the sockets above ground level was approx. 900mm.

The 'positive' at this location, is that the socket heights are in line with the outcomes of the User Trial and will facilitate easier interaction with the units for disabled persons. However, it is evident that the surfaces in the immediate vicinity of the charging devices requires upgrade to provide appropriate bays and access aisles to ensure safe and easier access for people with mobility impairments. Also the steep pedestrian routes to this site would likely exclude access for some persons with impaired mobility.

Figure 19: shows network operators sign on how to use chargepoint

The information provided on this sign appears to indicate a simple procedure for charging, providing the user either has the EO App installed on a smartphone or is able to download the App there and then and scan a QR code on the charger unit, which for some mobiles requires an additional App to be used. The use of such chargepoint networks can therefore be a complex process for visitors to the area who have ever used this network.

Some text on this sign board can also be difficult to read due to poor contrast between the white-on-green and green-on-white colours used.

Cross View Terrace, Neville's Cross, Durham City, DH1 4FA

Figure 20: Two images of shows proposed EV charging bays

The images on the preceding page shows how the Neville's Cross site appeared when initially visited on 13 August 2021. The overall width for development of EV chargepoints was limited to approx. 9m width for bays plus approx. 1.2m-1.5m additional width available for access along the side of the end bay. The latter

feature was proposed to be curtailed due to its potential impact on the vehicle exit route to the A167 as shown in the aerial view from Google Maps, with road exiting to right of the site.

The contractors' initial proposals identified provision of one rapid charging bay and two fast charging bays utilising standard parking bay sizes with approx. 0.8m-0.9m width side access aisles. The proposed works included extending the bay surface into the grass embankment and provision of a retaining wall. Although the initial site visit confirmed there was inadequate space to fully accommodate accessibility requirements, a diagram was provided to illustrate how the available space may be used more effectively to facilitate accessibility to at least one or more charging bays.

A follow-up site visit on 10 January 2022 while site works were underway confirmed the extension into the embankment and a retaining wall had been achieved and initial cable runs developed ready for DNO connection. However, the planned extension of the bay surface level up to the inset retaining wall had not been appropriately achieved, and further work is required to address this before installation of the chargepoints at vehicle bay level. A revised drawing has been provided to confirm the suggested bay layouts and protective bollards arrangement based on the current space and current indicated locations for the 50kW DC Rapid Charger and 22kW AC twin-socket Alfen Fast Charger. However, the final layout will only be confirmed after final review between MER, the chargepoint operators, and the contractors responsible for the installation; and subject to the required retention of space for Motorcycle parking alongside the charging bays.

The following diagram aims to provide the best possible layout to enable disabled users to have adequate access to a charging device at this location, within the restricted space to accommodate the required provisions. The suggested layout shows the end bay with a Rapid Charger provided within the 1200mm wide aisle shared with the adjacent bay. This arrangement will enable a disabled driver to exit via the 1200mm wide shared aisle and to manoeuvre with any required mobility aid within the 1600mm wide aisle to charge their vehicle. A 1200mm deep rear access aisle is also shown.

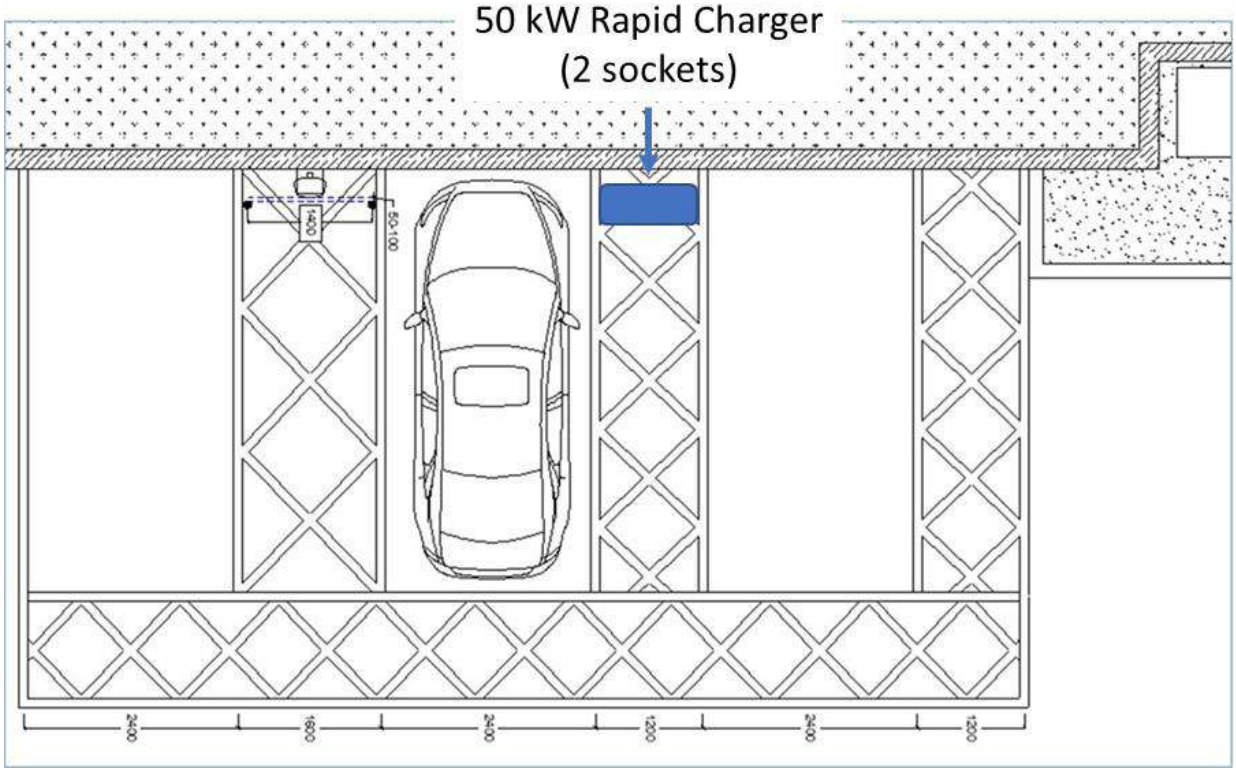


Figure 21: shows suggested layout for the Neville's Cross site

5. NEXT STEPS FOR EVCP GUIDANCE DEVELOPMENT

Looking forward beyond the limits of this current project, there remains a need for continued research into issues around the design of EV charging facilities and electric vehicles as discussed and recommended in the Stage 3 report. Issues that are advised for further review and investigations, which will likely need to involve further user trials, are expected to include:

- Confirming inclusive charging socket height for standing and seated users;
- Improving ease of insertion and extraction of EV cables connection at charging sockets on chargepoints and vehicles;
- Sourcing options to overcome or mitigate the difficulties of cable handling, cable weight and cable stiffness;
- Confirming protection bollards arrangement for inclusive access to charging devices;
- Adequacy of display screen legibility in external as well as internal environments.

It was also evident from the experience of the project's User Trial event, as well as from other consultation with non-EV users, that there is a potential need for further trials and / or try-out days for the public to increase awareness around the use of EVs and chargepoints; which should be recognised as a very important part of encouraging more people to change over to the use of electric vehicles between now and 2030.

Based on current experience from this project and reviews of existing EVCP installations, it appears there is a need for changes in current Regulations to require appropriate provision to address the provision and location of accessible EV charging facilities when EV charging is provided within existing and new parking provision.

5.1.1. Project References

Primary references for this project have included:

- BS 8300-1:2018 Design of an accessible and inclusive built environment: Part 1 External Environments – Code of practice.
- BS 8300-2:2018 Design of an accessible and inclusive built environment: Part 2 Buildings – Code of practice.
- IET Code of Practice: Electric Vehicle Charging Equipment Installation 4th Edition 2020.