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National Fire
Chiefs Council

The professional voice of the
UK Fire & Rescue Service

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13 November 2023

Dear Department of Finance,

Consultation on the review of energy efficiency requirements and related areas of Building Regulations

Thank you for the opportunity to comment on the discussion document 'Review of energy efficiency requirements and related areas of Building Regulations.'

NFCC is the professional voice of the UK fire and rescue service (FRS) and is comprised of a council of Chief Fire Officers and wider membership. NFCC's response to this consultation was compiled by the Strategy and Policy Team in consultation with NFCC members and with input from senior leaders across FRSs.

Whilst much of the consultation goes beyond the scope of NFCC, it is considered appropriate for comment to be made on areas that may affect fire safety features of buildings and the ability of firefighters to tackle any incidents that may occur. The focus of our response therefore relates to Section 3E and Section 4D of the document, both relating to electric vehicle infrastructure.

NFCC is supportive of environmental policies and recognises the need to adapt to changing technologies with regard to alternative fuel sources for transportation. In this regard, it is sensible to outline minimum requirements for charging infrastructure for new buildings to enable the adoption of Electric Vehicles (EV) and also to provide guidance on the minimum standards expected. However, we urge the Department of Finance to undertake further work to ensure that EV charging does not have a negative impact on the fire safety of the public and of firefighters.

Whilst acknowledging the intention of the document is to provide an early outline of potential proposals, we would like to highlight at this earliest opportunity the necessity of developing detailed guidance on how the proposed EV charge points and supporting infrastructure can be safely integrated into the built environment, both for new construction and retrospectively. Without this detailed guidance we can foresee numerous challenges with regard to Firefighting and Fire Safety which should be addressed in the guidance provided to support the Building Regulations.

We welcome the opportunity to respond to this discussion document consultation and we would welcome further engagement from Government officials as policy and associated guidance continues to be developed.

Yours sincerely,

A handwritten signature in black ink that reads "N. Coombe". The signature is written in a cursive, slightly slanted style.

Nick Coombe

Head of Protection

Protection Reform Unit

Section 3E: Electric Vehicle infrastructure- background and Phase 3 proposals for dwellings

Q.3E.1 Do you agree with the proposed approach to use Building Regulations to legislate for EV infrastructure requirements?

Introducing charge points in and around buildings, and the encouragement for potentially exclusive EV use within these spaces has significant impact on many areas of Building Regulations, most notably fire safety.

NFCC is concerned to ensure the implementation of new requirements in the built environment is not taken in isolation, and the standard of safety expected in car parks, (particularly covered car parks or those in basements) should not be undermined by the introduction of new technology. The hazards and associated risks posed by EVs in event of fire need to be understood, with the mitigation measures being required on the basis that the event may happen, not how often. NFCC acknowledge it may be a relatively low probability event but by definition this means it can occur, and when it does occur, there exists the very real potential for this to be a high consequence event involving the uncontrolled fire development across a number of closely parked vehicles e.g., a multiple vehicle fire in a basement car park beneath a block of flats.

The requirements of EV charging will likely require additional technical requirements to safely implement the policies contained within this consultation. The guidance to support those additional technical requirements needs to be in place prior to the mandating of extensive charging facilities.

The installation of EV charge points may have greater implications on building safety than anticipated. It may be unclear to those undertaking the work whether the building's existing fire precaution arrangements are sufficient to mitigate the introduction of the additional risk of EV charging, or whether additional measures, are required to be retrospectively installed.

There is a danger that in complying with this mandate, those responsible for a building may fall foul of other legislation or unwittingly make their building less safe than it was prior to the installation of the charge points.

In addition, recent high-profile car park fires have provided some evidence that the current levels of fire resistance in car parks is not fit for purpose. Although not caused by an EV, a recent car park fire at Luton Airport resulted in a partial collapse of the structure, with approximately 1,500 vehicles unlikely to be salvageable, mirroring a similar car park fire at the Liverpool Echo Arena¹ in 2017.

Q.3E.2 Do you agree with the proposed approach to follow the technical provisions in England? The Department would be grateful for any comment on the guidance or out-workings there or in other regions.

As part of our submission for the [Technical Review of Approved Document B](#), (ADB) NFCC has called for a review of the requirements for car parks to take account of the products and materials used in modern cars, and to consider additional requirements for automatic water suppression systems and structural safety above those specified in the current guidance.

Whilst the full technical review of ADB is still underway, NFCC consider that the proposal to introduce new requirements for EV in car parks should also consider the need to issue additional guidance.

Q.3E.3 Do you agree that for new dwellings with associated parking spaces; one CP per dwelling or one per associated parking space (whichever is the lesser) should be required and that, in addition, for those buildings with more than ten associated parking spaces, ducting to the rest of the residential parking spaces to facilitate future installations, should also be required?

Any proposal to mandate EV charging points should be accompanied by a review of other appropriate aspects of the Building Regulations as per our response to Q.3E.1.

If EV charging is mandated there will be a need for clarity as to where the power for each parking space is drawn from. If it is an extension of a dwelling owner's domestic supply, then there will be onward implications when considering cabling, ducting, fire separation and fire compartmentation requirements. These would need further consideration and guidance in order to be able to comply.

Q.3E.4 Do you agree with the proposed limitations 1 and 2 (as outlined in paragraph 3E.34 and 3E.35) restricting the application of the requirements for EV infrastructure at parking spaces associated with new dwellings?

Yes - NFCC supports the proposed limitations and would emphasise that any future requirements for dwellings should be part of a holistic package of safety measures which look to improve safety and resilience for EV charging. Such guidance should also look to future proof measures where possible in order to account for changing battery technologies.

Q.3E.5 Do you think there should be a limitation to the application of the requirements, on the grounds of additional grid connection costs that may accrue to developers as a result of the provision of CPs?

It is not within the remit of the NFCC to comment on grid connection costs, however it is important that any costs factor in the requirements in terms of fire safety features such as fire stopping, suppression and ventilation etc. or costs associated with the supply of adequate water for firefighting.

Q.3E.6 If the answer to Q 3E.5 is yes, do you think the amount of £3600 (which is currently under review) is appropriate and do you have any comment on how it should be assessed?

Please refer to our response to Q.3.E.5

Q.3E.7 Do you agree that where a major renovation results in a residential building being associated with more than 10 parking spaces, then CPs should be provided at a rate of one per dwelling, or one per associated parking space (whichever is the lesser) and that that ducting should be installed in each associated car parking space, to support the future installation of an EV CP?

Any proposal to mandate EV charging points should be accompanied by a review of other appropriate aspects of the Building Regulations as per our response to Q.3E.1. and Q.3E.3

Q.3E.8 Do you agree with the proposed limitations to these requirements in the case of major renovations, as outlined in paragraph 3E.41-3E.47, or have you any further comment on them?

Neither agree nor disagree. NFCC does not disagree with any of the proposed limitations, but would emphasise that any requirements for dwellings established under a major renovation should be part of a holistic package of safety measures which look to improve safety and resilience for EV charging. Such guidance should also look to future proof measures where

possible in order to account for changing battery technologies. Our answer to Q3E.13 outlines the factors that should be considered in this area.

Q.3E.9 Do you agree that where a dwelling is created through a material change of use, a CP should be required at any parking space associated with the new dwelling?

The installation of EV charge points may have greater implications on building safety than anticipated and should not be treated in isolation. This proposal should form part of a holistic review of requirements in a building as it may be that the installation of CP may have wider implications for fire and structural safety. It may be unclear to those undertaking the work whether the building's existing fire precaution arrangements are sufficient to mitigate the introduction of the additional risk of EV charging, or whether additional measures, are required to be retrospectively installed. There is a danger that in complying with this mandate, those responsible for a building may fall foul of other legislation or unwittingly make their building less safe than it was prior to the installation of the charge points.

In our experience, when considering the physical requirements in altering an existing building to support a 'change of use', issues around fire separation are often encountered. For example, the omission of cavity barriers when upgrading fire compartmentation is a common deficiency. It would appear the assessment of required upgrades is regularly found wanting, in that the understanding of how to practically achieve the mandatory enhancements is lacking or underappreciated.

Q.3E.10 Do you agree with the proposed limitations to the application of the requirement, where a newly created dwelling is established under a material change of use, as outlined in paragraph 3E.51-3E.55?

Neither agree nor disagree. NFCC does not disagree with any of the proposed limitations, but would emphasise that any requirements for dwellings established under a material change of use should be part of a holistic package of safety measures which look to improve safety and resilience for EV charging. Such guidance should also look to future proof measures where possible in order to account for changing battery technologies.

Q.3E.11 Should a cost cap apply, instead of limiting the number of CPs on the basis of the existing supply, where a new electrical supply connection to the building occurs alongside a major renovation, or a material change of use that creates a new dwelling?

It is not within the remit of the NFCC to comment on this question.

Q.3E.12 Should there be a requirement for cable routes to all spaces associated with dwellings newly created by way of a material change of use, in circumstances where a building has more than 10 parking spaces?

Please refer to our response to Q.3E.9

Q.3E.13 Do you have any other views that you wish to provide on the EV section of the consultation (e.g. the minimum standard of EV charge point or safety and accessibility within the built environment)?

NFCC considers the main risks from EVs (in fire) can be including but not limited to:

- Directional (focused) jet flames of many hundreds/thousands of degrees.
- Uncontrolled fire development due to the close proximity of other EV and ICE vehicles.
- The production of toxic products – and uniquely for EVs, Hydrogen Fluoride.

- The production of a potential explosive vapour cloud – also impacting the access of firefighters into enclosed spaces.
- Very difficult to extinguish, can take many hours if not days.
- Potential for reignition, again, hours or even days after, leading to complexity with vehicle recovery from enclosed spaces.
- They require very large amounts of water to cool.

Research and innovation with battery technology continues to evolve which means that consideration should be given to how future technologies (e.g. sodium based batteries) may behave in a fire and therefore potentially impact on the built environment. Therefore, the expectation of the charge points as set out within this consultation, needs to be linked to significant review of guidance to consider the impact of EVs in and around buildings, with particular focus on:

Suppression - We believe that suppression such as sprinklers is vital, and should be mandated, to allow the suppression and control of fire development to allow for both safe means of escape for occupants (including persons with disabilities) and to allow fire crews to be able to access the basement levels for firefighting. Basement fires are the most onerous in terms of firefighting and can quickly exceed (by many hundreds of degrees) conditions which firefighters can possibly descend in to. Current and future battery technologies and how they may react in both a fire and to the means of suppression should be properly considered, to ensure that suppression is to an appropriate level. The use of suppression in areas of EV charging should also take account of the need for automatic electrical cut-off in the event of a sprinkler activation to prevent additional hazards relating to water and electricity.

Where retrospective installation is required in existing car parks, it may be necessary to mandate increased fire protection measures which should include the installation of suppression systems to account for the change in fire load.

Evidence derived from global research, and research conducted by the Building Research Establishment (BRE) demonstrates the effectiveness of sprinklers in controlling fires in car parks. It shows that the incidence of fatalities and injuries is zero, and the property loss is around 95% lower than that of an uncontrolled fire.

NFCC recommend Automatic Fire Suppression Systems (AFSS) be required in:

- Open sided car parks to protect property, including the fabric of the building. While there have been few incidences of fatalities in car parks, there have been recorded fatalities to firefighters due to structural collapse abroad.

NFCC strongly recommend AFSS be required in:

- Enclosed car parks, as is common in Europe and also recommended by National Fire Protection Association Standard 88 (NFPA 88) in the USA.
- Basement car parks, and in particular, those with associated accommodation above. This is a common requirement in Europe and recommended by NFPA 88 in the USA.

Research undertaken by BRE in 2010 also supports this approach.

Ventilation – similarly, ventilation is required in car parks to allow for the transportation of products of combustion away from the fire location, which assists control of fire spread and is essential for protecting the lives of firefighters. Toxicity from failed batteries should also be considered.

Firefighter Safety - NFCC have concerns about the safety of our members when tackling EV fires, particularly in ones within enclosed car parks. We do not want commanders to be in the position where they have to make a decision around the tackling of the blaze where there could be pressure to put their staff at risk.

Access and facilities for firefighting – whilst access for firefighting is clearly linked to our expectations in terms of structural fire protection, suppression and ventilation, there are additional firefighting requirements for extensive use of EV. All EV installations should require a mandatory cut off switch for use of fire and rescue services so that power to all charging points within a car park can be isolated with a single action. This will allow firefighters to apply firefighting media (such as water), and to conduct search and rescue safely without power being supplied to the charging facilities. The cut-off switch should be located at the fire service entry point to the car park and may require repeater switches to alternate entry points.

EV fires require a prolonged period of battery cooling and the most common method is by the continued application of water therefore the provisions for the supply of water for firefighting needs to be factored in. For some recent large incidents, it is hypothesised up to 5,000 litres a minute would be appropriate. As such, there is a risk that existing water supplies to some buildings may not be sufficient to safely enable EV charging to be retrofitted. Firefighting water supplies need to be accessible and sufficient in capacity to be able to support this as well as other firefighting activities (such as protecting adjacent structures from fire spread). Consideration would also need to be made for the drainage and treatment of firefighting water run-off that would be required for the duration of any incident.

Automatic parking and car stacker systems – a modern solution to lack of space within car parks is to provide a system to automatically (i.e. without a driver) park vehicles, or frames to allow for parking vehicles on top of one another (stacker systems). Both car stackers and automatic parking systems result in cars being far closer together, either side by side, or on top of one another. These systems significantly increase the potential for, and the speed of, fire spread between vehicles, and common systems such as suppression and ventilation need to be specifically designed to account for that increased potential fire development. These systems will need to be carefully considered to determine if they are appropriate for EVs, and if so, clear technical guidance will be required.

While we have separated elements above into discrete subject areas it should not be read that one allows for the removal of another. It is likely that the extensive use of EVs will require greater minimum technical requirements concurrently for all of the areas above.

Wider consideration is needed on how to prepare related infrastructure and the built environment if the Government wishes to safely enable greater uptake of electric vehicles. For example, where sub stations may be required to enhance the existing infrastructure, the impact of associated earthing systems on the surrounding built environment and the applicable separation distances required (and the maintaining of compartmentation), should be factored into the design.

Section 4D: Electric vehicle infrastructure- Phase 3 proposals for buildings other than dwellings

Q4D.1 Do you agree with the proposed use of Building Regulations to implement Article 8.2 for the provision of EV charging point infrastructure at buildings other than dwellings?

As per our response to Q.3E.1, introducing charge points in and around buildings, whether they be residential dwellings or buildings other than dwellings, and the encouragement for

potentially exclusive EV use within these spaces has significant impact on many areas of Building Regulations, most notably fire safety.

It is our opinion that building design guidance needs to be updated holistically in order to take into account the areas outlined in our response to Q3E.13

Q4D.2 Do you agree that ducting infrastructure for one in five parking spaces and one charging point, should be installed when a non-residential buildings with more than 10 non-residential car parking spaces is being erected or is undergoing a major renovation?

It is our opinion that building design guidance, including ducting infrastructure, needs to be updated holistically in order to take into account the areas outlined in our response to Q3E.13

Q4D.3 Do you agree with the proposed limitations (outlined in para 4D.13- 4D.18) to the application of EV charging requirements for new non-residential buildings and for major renovations of such buildings? If not, please comment on how should they be changed

Neither agree nor disagree. NFCC does not disagree with any of the proposed limitations, but would emphasise that any requirements for new non-residential dwellings and for major renovations should be part of a holistic package of safety measures which look to improve safety and resilience for EV charging. Such guidance should also look to future proof measures where possible in order to account for changing battery technologies. Our answer to Q3E.13 outlines the factors that should be considered in this area.