HOUSTON PUBLIC WORKS

Date:	November 28, 2023
To:	City of Houston HPW-HPC
Attention:	CCM
From:	Jensen Hughes
Subject:	Electric Vehicle (EV) Readiness

This technical memo is provided to describe the new changes to the Houston Amendments to the 2021 International Energy Conservation Code (IECC) for Commercial and Residential provisions with regards to the requirement for EV readiness. These changes provide options for builders and owners to provide EV ready construction.

Background

1. The Construction Code Modernization Committee and City of Houston recognizes the growing popularity and increased demand for electric vehicles (EV), with projections suggesting that within the next 10 years, fifty percent of all new vehicles will be electric. Both commercial building owners and residential homeowners want EV charging stations in their buildings. Prior editions and the 2021 edition of the IECC did not include guidance on how to install EV charging stations. These new amendments brought forth based on proposals to the 2024 Edition of the IECC will provide guidance on proper installation, electric hazard safety requirements, and proper locations for EV charging stations.
2. Both Electric Vehicle “EV” ready Appendix CD for commercial provisions and Appendix RD for residential provisions will be optional and are intended to be used as guidelines for future EV installs.

Amended Residential Provisions Section RD102 – RESIDENTIAL EV-READY REQUIREMENTS (OPTIONAL).

RD102.1 Electric Vehicle Power Transfer Infrastructure. New automobile parking spaces for one- and two-family dwellings and townhouses shall be provided in accordance with this section. All other new residential parking facilities shall be provided with electric vehicle power transfer infrastructure in accordance with Appendix CD.

RD102.2 Quantity. Each dwelling unit with a designated attached or detached garage or other onsite private parking provided adjacent to the dwelling unit shall be provided with one EV ready space.

RD102.3 EV Ready Spaces. Each branch circuit serving EV ready spaces used to comply with Section RD102.2 shall comply with all of the following:

1. Terminate at an outlet or enclosure located within 3 feet (914 mm) of each EV ready space it serves.
2. Have a minimum circuit capacity of 9.6 kVA (or 40A at 240V).
3. The panelboard or other electrical distribution equipment directory shall designate the branch circuit as “For electric vehicle supply equipment (EVSE)” and the outlet or enclosure shall be marked “For electric vehicle supply equipment (EVSE).”
4. Where a circuit is shared or managed, it shall be in accordance with NFPA 70.

Justification:

The Electric Vehicle appendix is optional and not part of the base code. This change provides direction for homeowners looking to make EV ready parking spaces.

Amended Commercial Provisions Section CD102 – COMMERCIAL EV-READY REQUIREMENTS (OPTIONAL).

CD102.1 Electric Vehicle Power Transfer Infrastructure. New parking facilities shall be provided with electric vehicle power transfer infrastructure in compliance with Sections CD102.2 through CD102.8.

CD102.2 Quantity. The number of required EV spaces, EV capable spaces and EV ready spaces shall be determined in accordance with this Section and Table CD102.2 based on the total number of automobile parking spaces and shall be rounded up to the nearest whole number. For R-2 buildings, the Table requirements shall be based on the total number of dwelling units or the total number of automobile parking spaces, whichever is less.

1. Where more than one parking facility is provided on a building site, the number of required automobile parking spaces required to have EV power transfer infrastructure shall be calculated separately for each parking facility.
2. Where one shared parking facility serves multiple building occupancies, the required number of spaces shall be determined proportionally based on the floor area of each building occupancy.
3. Installed EVSE spaces that exceed the minimum requirements of this section may be used to meet minimum requirements for EV ready spaces and EV capable spaces.
4. Installed EV ready spaces that exceed the minimum requirements of this section may be used to meet minimum requirements for EV capable spaces.
5. Where the number of EV ready spaces allocated for R-2 occupancies is equal to the number of dwelling units or to the number of automobile parking spaces allocated to R-2 occupancies, whichever is less, requirements for EVSE spaces for R-2 occupancies shall not apply.

6. Requirements for a Group S-2 parking garage shall be determined by the occupancies served by that parking garage. Where new automobile spaces do not serve specific occupancies, the values for Group S-2 parking garage in Table CD102.2 shall be used.

Exception: Parking facilities, serving occupancies other than R-2 with fewer than 10 automobile parking spaces.

TABLE CD102.2
REQUIRED EV POWER TRANSFER INFRASTRUCTURE

Occupancy	EVSE Spaces	EV Ready Spaces	EV Capable Spaces
Group A	10%	0%	10%
Group B	15%	0%	30%
Group E	2%	0%	5%
Group F	2%	0%	5%
Group H	1%	0%	0%
Group I	2%	0%	5%
Group M	10%	0%	10%
Group R-1	20%	5%	75%
Group R-2	20%	5%	75%
Group R-3 and R-4	2%	0%	5%
Group S (exclusive of parking garages)	1%	0%	0%
Group S-2 (parking garages)	1%	0%	0%

CD102.3 EV Capable Spaces. Each EV capable space used to meet the requirements of Section CD102.2 shall comply with all of the following:

1. A continuous raceway or cable assembly shall be installed between an enclosure or outlet located within 3 feet (914 mm) of the EV capable space and a suitable panelboard or other onsite electrical distribution equipment.
2. Installed raceway or cable assembly shall be sized and rated to supply a minimum circuit capacity in accordance with CD102.6.
3. The electrical distribution equipment to which the raceway or cable assembly connects shall have sufficient dedicated space and spare electrical capacity for a 2-pole circuit breaker or set of fuses.
4. The electrical enclosure or outlet and the electrical distribution equipment directory shall be marked: "For future electric vehicle supply equipment (EVSE)."
5. Reserved capacity shall be no less than 4.1 kVA (20A 208/240V) for each EV capable space.

CD102.3. EV Ready spaces. Each branch circuit serving EV ready spaces used to meet the requirements of Section CD102.2 shall comply with all of the following:

1. Terminate at an outlet or enclosure located within 3 feet (914 mm) of each EV ready space it serves.
2. Have a minimum circuit capacity in accordance with CD102.6.
3. The panelboard or other electrical distribution equipment directory shall designate the branch circuit as “Fire electric vehicle supply equipment (EVSE)” and the outlet or enclosure shall be marked “For electric vehicle supply equipment (EVSE).”

CD102.4 EVSE Spaces. An installed EVSE with multiple output connections shall be permitted to serve multiple EVSE spaces. Each EVSE installed to meet the requirements of Section CD102.2, serving either a single EVSE space or multiple EVSE spaces, shall comply with all of the following:

1. Have a minimum circuit capacity in accordance with CD102.6.
2. Have a minimum charging rate in accordance with CD102.5.
3. Be located within 3 feet (914 mm) of each EVSE space it serves.
4. Be installed in accordance with Section CD102.8.

CD102.5 Minimum charging rate. Each installed EVSE shall comply with one of the following:

1. Be capable of charging at a minimum rate of 6.2 kVA (or 30A at 208/240V).
2. When serving multiple EVSE spaces and controlled by an energy management system providing load management, be capable of simultaneously sharing each EVSE space at a minimum rate of no less than 3.3 kVA.
3. When serving EVSE spaces allowed to have a minimum circuit capacity of 2.7 kVA in accordance with CD102.7 and controlled by an energy management system providing load management, be capable of simultaneously charging each ESVE space at a minimum rate of no less than 2.1 kVA.

CD102.6 Circuit capacity. The capacity of electrical infrastructure serving each EV capable space, EV ready space, and EVSE space shall comply with one of the following:

1. A branch circuit shall have a rated capacity not less than 8.3 kVA (or 40A at 208/240V) for each EV ready space or EVSE space it serves.

2. The requirements of CD102.7.

CD102.7 Circuit capacity management. The capacity of each branch circuit serving multiple EVSE spaces, EV ready spaces or EV capable spaces designed to be controlled by an energy management system providing load management in accordance with NFPA 70, shall comply with one of the following:

1. Have a minimum capacity of 4.1 kVA per space.
2. Have a minimum capacity of 2.7 kVA per space when serving EV ready spaces of EVSE space for R02 occupancies when all (100%) of the automobile parking spaces designated for R-2 occupancies are designed to be EV ready spaces or EVSE spaces.
3. Have a minimum capacity of 2.7 kVA per space when serving EV ready spaces or EVSE spaces for a building site when all (100%) of the automobile parking spaces are designed to be EV ready or EVSE spaces.

CD102.8 EVSE installation. EVSE shall be installed in accordance with NFPA 70 and shall be listed and labeled in accordance with UL 2202 or UL 2594. EVSE shall be accessible in accordance with International Building Code Section 1107.

Justification:

The Electric Vehicle appendix is optional and not part of the base code. This change provides direction for builders looking to make EV ready parking spaces based on building occupancy type.