

Exhibit G – Design Guidelines

This exhibit serves as a reference for EV developers working with NYCHA to ensure compliance with design and standards. NYCHA's Design Guidelines are available publicly at this link: <https://designguidelines.nycha.info/>

1. Review and Submission Requirements

Plans and Documentation

- Obtain archival drawings from NYCHA and survey site as necessary. Stamped survey from the project developer may be required.
- Design based on [NYCHA Design Guidelines](#) and best practices.
- Coordinate with any additional construction planned at the development.
- Submit schematic and full construction drawings and specifications to NYCHA for review by Architectural and Engineering Services (AES) prior to filing for permits with any agency having jurisdiction.
- Consolidate all drawings for a single development into one PDF for submission and review.
- Revise based on comments to NYCHA's satisfaction.
- Ensure notes and details are site-specific; provide specific, not generic details, including materials and weather proofing.
- Wayfinding signage must be reviewed and accepted by NYCHA.

2. General Design

General Installation

- Transformers, meters, and other electrical equipment should be installed in secured areas where possible.
- Conduit should be placed underground wherever possible. Conduits not underground must be in the least visually and least physically obstructive locations.

Electrical Vehicle System Equipment (EVSE)

- The EVSE shall be listed and certified.
- The EVSE shall have a listed system of protection against electric shock of personnel.
- The EVSE shall have a sufficient rating.
- Enclosure of the EVSE shall be rated and constructed in accordance with applicable codes, standards, and environmental conditions and NEMA(4X) for outdoor application.

- EVSE marking shall be done by the manufacturer.

Flood Protections

- Many NYCHA properties are within coastal and stormwater flood risk areas. If installing in flood-prone areas, consider elevating critical electrical structures or dry-floodproofing them.

Lighting

- Consider adding lighting to the parking area if it seems inadequate for 24/7 use.
- Refer to NYCHA's Design Guidelines related to site lighting for fixture details and recommendations.

Site Paving, Parking Lots, and Restoration

- Refer to NYCHA Design Guidelines for standard details on parking lots, vehicular asphalt pavement, pedestrian pathways, and concrete vaults as applicable.
- Any component of an installation must maintain [ADA accessible routes](#) & parking spaces (e.g. if the install itself is on the sidewalk, need to maintain ADA access route on the sidewalk).
- The number of parking spaces in the parking lot cannot be reduced from what was shared with the EV developer unless it is to create an ADA parking space.
- If the EV developer would like to install per-space parking gates, confer with NYCHA for standards and implementation.
- Ensure new pavement is flush with existing pavement.

Installation Standards

- Conduits must comply with NYCHA design standards and fire code amendments.
- Electrical wire must be copper, and conduit must be RGS or PVC-coated RGS if trenched.

3. Electrical

Fire-Resistance-Rated Construction

- Ensure conduit penetrations through fire barriers are properly sealed with firestop systems.

Means of Egress

- Conduits must not obstruct egress paths and must comply with width requirements, interior or exterior.
- Installations must not block fire doors or exits, interior or exterior.
- Exposed conduit and anchors within reach should be impact and vandal resistant.

New Service / Service upgrade

- Existing electrical infrastructure (main service panel, feeders etc.) conditions and capacity shall be evaluated by the Project Developer and submitted to NYCHA for review.
- The utility coordination plan shall include integration of the EVSE installation with the existing electrical infrastructure.
- New Service/ Service upgrade /metering plan will be required for review by NYCHA.
- Service upgrade plan shall include short-circuit fault current analysis for EVSE installation.
- The EVSE schedule and the electrical three line/single line diagram shall be included with the other electrical construction document / drawings.
- Surge protection devices (SPD) will be required and provided accordingly.

Load calculation and future growth

- EV charging load shall be continuous load.
- Demand load study will be required for multi-port installation plan.
- Transformer, service equipment, feeder, and branch circuits shall be sized using the applicable derating factors required by the NEC and utility and other applicable standards.

4. Transformers

General

- Follow NYC Zoning Resolution, Building Code and NYC Noise code regarding noise and distance from buildings, property lines and setbacks
- Refer to NYCHA's Design Guidelines for electrical systems for transformer installations as applicable.
- The transformer shall be suitable for continuous full-load operation and shall comply with all applicable NEC, IEEE, ANSI, DOE, and utility standards.

- The transformer shall be an outdoor-rated MV/LV distribution transformer designed to supply Level-2 and DCFC electric vehicle charging equipment.
- All equipment shall be NRTL-listed, labeled, and certified.

Location

- The transformer location shall be determined in coordination with the Authority Having Jurisdiction (AHJ), the serving utility, and with NYCHA.
- Placement shall consider voltage-drop control, public safety clearances, and all applicable utility and code requirements.

kVA Sizing for EV Load

- The transformer shall support continuous high-demand loads from Level-2 and DCFC chargers.
- Sizing shall consider the maximum connected EV charging load, including continuous duty per NEC.
- The transformer shall be sized in accordance with NEC requirements, utility service rules, and IEEE loading guidelines.

Enclosure

- The transformer shall be provided with a weatherproof outdoor enclosure, minimum NEMA 3R; NEMA 4X or enhanced corrosion protection is recommended for harsh environments.
- The enclosure shall be utility-grade and designed to prevent unauthorized access.
- The enclosure shall dissipate full-load heat losses without exceeding the transformer's rated temperature rise.
- Enclosure construction shall comply with ANSI/IEEE C57 requirements for transformers.

Ventilation

- Transformer cooling and ventilation shall comply with NEC, IEEE, ANSI C57, and manufacturer requirements.
- Ventilation openings shall be screened, weather-protected, and tamper-resistant.
- Natural air cooling (ONAN) shall be used unless otherwise specified by the utility or other AHJ.

- Adequate clearance shall be maintained around the transformer to ensure unrestricted airflow per NEC and applicable standards.

Grounding and Bonding

- Grounding and bonding shall comply with NEC Article 250, utility grounding requirements, and applicable IEEE grounding standards.
- All metallic parts, enclosures, and secondary systems shall be properly bonded.

Coordination with Utility

- Coordinate with the serving utility to confirm available fault current at the service point.
- Verify utility protection schemes and ensure site protection devices are properly coordinated.
- Confirm metering requirements, including location, configuration, and utility access.
- Meet all utility service entrance requirements for transformer connection, grounding, and equipment clearances.

5. Service Switchboard

General

- Provide a service switchboard installed downstream of the MV/LV transformer supplying Level-2 and DCFC charging equipment.
- The switchboard shall comply with NEC and utility service entrance requirements.
- Equipment shall be suitable for continuous operation as per NEC.

Enclosure

- Enclosure shall be NEMA 3R / 4 / 4X for outdoor installations.

Service Entrance

- The switchboard shall be configured as service entrance equipment and include:
 - i. Main service disconnect (breaker or fusible switch)
 - ii. Utility-approved metering section
 - iii. Grounding and bonding provisions per NEC Article 250
 - iv. Barriers and isolation as required for service entrance rating

- Service entrance labeling shall comply with NEC requirements.

Feeder Sections

- Provide feeder breakers sized for:
 - i. DCFC chargers
 - ii. Level-2 chargers
 - iii. Lighting, controls, and auxiliary loads
- Breakers shall be fully rated or series-rated per NEC and utility requirements.

Metering

- Provide a utility-approved metering compartment integrated into the switchboard.
- Metering shall comply with utility requirements for:
 - i. Location
 - ii. CT/PT configuration
 - iii. Access and security
- Metering section shall be isolated from customer equipment.

Protection

- Protection devices shall be coordinated with:
 - i. Upstream transformer protection
 - ii. Utility protection schemes
 - iii. Downstream EVSE equipment
- Provide selective coordination where required by NEC.
- Provide surge protection devices (SPD) where required by the utility or project specifications.

Identification and Labeling

- Provide permanent, engraved labels for:
 - i. Main disconnect
 - ii. Feeder breakers
 - iii. Metering section
 - iv. Grounding points
- All labeling shall comply with NEC and utility requirements.

Coordination with Utility

- Coordinate with the utility to confirm:
 - i. Available fault current
 - ii. Metering requirements
 - iii. Service entrance configuration
 - iv. Protection schemes
 - v. Clearances and access requirements

6. Panelboard

General

- Provide a dedicated panelboard for EV charging loads, supplied from the upstream service switchboard through a step-down transformer.
- Panelboard shall comply with NEC and all applicable standards.
- All EV charging loads shall be treated as continuous loads and sized at as per NEC.
- Equipment shall be NRTL-listed, labeled, and certified.

Enclosure

- Enclosure type: NEMA 3R or 4X for outdoor/exposed locations.
- Enclosure and hardware shall be corrosion-resistant and suitable for the installation environment.

Load Calculations and Demand Factors

- Perform load calculations per NEC.
- Panelboard bus and main rating shall be based on continuous duty and EV load diversity where applicable.

Feeder Requirements

- Feeders supplying the panelboard shall comply with NEC.
- Feeder overcurrent protection shall be coordinated with downstream breakers.

Identification and Labeling

- Each EVSE circuit shall be permanently labeled with:
 - i. EVSE ID or stall number
 - ii. Circuit rating and voltage
 - iii. Panel and circuit designation

- Provide a complete circuit directory inside the panel door.
- All labeling shall comply with NEC and be engraved or industrial-grade printed.

7. Trenching

Pre-Design Considerations

- Verify underground utilities, tree roots, paving, foundation footings, and flood zone impacts before design.
- Try to avoid installing trench under drip line of trees which could affect their roots.

Structural Requirements

- Provide measurements (depth, width, length) of trenching.
- Indicate sidewalk cut locations and repaving/fencing restoration details.

Tree Protection

- Install tree protection around all trees in the work area.
- Exercise extra care when working adjacent to trees; hand excavation may be required.
- Minimize disturbance to tree root zones and soil.
- Exercise extra care when working adjacent to trees; hand excavation may be necessary around trees.
- Tree roots 2" or larger must remain; any damage requires consultation with an arborist and NYCHA representative.

Electrical Considerations

- Confirm utility line locations and potential conflicts.
- Provide cable/conductor sizes and number of conductors.
- Specify alternative conduit materials (if applicable).
- The lighting and cooling system for the EV charging station may be separate from the EVSE panelboard.

Site Considerations

- Avoid trenching through waste yards, playgrounds, or key operational areas.
- Field inspectors must be present during trenching and route walkthroughs.