

Residential Load Calculation

Service capacity for added electric-vehicle supply equipment

Project	88 Halsey St — EV charger and service upgrade
Address	88 Halsey St, Montclair, NJ
Calculation method	NEC 220.83
Service voltage	240 V
EVSE continuous rating	48 A
Existing service	100 A
Generated	2026-08-05

Result

Calculated load	118.12 A
Minimum standard service	125 A
Existing service adequate	No — a service upgrade or load management is required
EVSE branch circuit	60 A minimum conductor ampacity
EVSE overcurrent device	60 A

Scope and limitations

This is a code-cited documentation package, not a stamped plan set. It has not been prepared, reviewed, sealed or signed by a licensed Professional Engineer.

Acceptance is not guaranteed. Authorities having jurisdiction amend and interpret the code, and may require additional information, a different calculation method, or a sealed drawing.

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The installing electrician remains responsible for verifying every input, for field conditions, and for compliance with the edition of the code and any local amendments actually adopted in this jurisdiction.

Load calculation worksheet — NEC 220.83

Connected load

Load	Basis	VA
General lighting — 1,750 ft ² at 3 VA/ft ²	220.12	5,250
Small-appliance branch circuits (2)	220.52(A)	3,000
Laundry branch circuit	220.52(B)	1,500
Electric range (nameplate)	220.55	12,000
Clothes dryer	220.54	5,000
Electric water heater	nameplate	4,500
Dishwasher	nameplate	1,200
Food waste disposer	nameplate	900
Built-in microwave	nameplate	1,500
Electric vehicle supply equipment — 48 A at 240 V	625.41 / 220.83	11,520
Total connected load		46,370

Demand factors

First 8,000 VA at 100%	8,000 VA
Remainder	38,370 VA
Remainder at 40%	15,348 VA
Air conditioning or space heating at 100%	5,000 VA
Calculated demand load	28,348 VA
Calculated current at 240 V	118.12 A

Notes and assumptions

- The charger is included in the connected load at nameplate: $48\text{ A} \times 240\text{ V} = 11520\text{ VA}$.
- Its branch circuit is separately sized at $125\% = 60\text{ A}$ (625.41), and that figure is not the same as its contribution to the 220.83 summation.
- Section 220.83 does not state whether a continuous EVSE load enters the connected-load summation at nameplate or at 125%, and authorities differ. Both figures are shown above; confirm which your AHJ expects before filing.
- 220.83(B) applies because A/C or electric space heating is being added. The larger of the two is counted at 100%, never both.
- The 40% demand factor is never applied to the HVAC load.
- Connected load means nameplate VA: general lighting, the small-appliance and laundry circuits, ranges, ovens, cooktops, dryers, water heaters and other fastened-in-place appliances.

EVSE branch circuit

Equipment continuous rating	48 A
Continuous-load factor (625.41)	125%
Minimum circuit ampacity	60.00 A
Minimum conductor ampacity	60.00 A
Overcurrent device (240.6(A))	60 A

- EVSE is a continuous load: $48A \times 125\% = 60A$ minimum circuit.

Conclusion

The calculated load exceeds the existing 100 A service. A service upgrade, or a load-management method under 625.42, is required.

Smallest standard service that covers the calculated load: 125 A.

Code references

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Section	Applied to
220.83	Existing dwelling unit — additional load. First 8 kVA at 100%, remainder at 40%.
220.83(B)	Added air conditioning or electric space heating counted at 100%; the larger of the two only.
625.41	Electric vehicle supply equipment is a continuous load — branch circuit at 125%.
625.42	EVSE rating; energy management as an alternative to increasing service capacity.
240.6(A)	Standard overcurrent device ratings.

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Software

CircuitProof v0.1.0 · calculation engine outputs are reproduced verbatim in this document; no figure on any sheet is recomputed at render time.