NYS Clean Heat Statewide Heat Pump Program

Load Calculation Guidance
July 15, 2025

Guidance for Acceptable Load Calculations

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This document provides guidance on how to perform heating and cooling load calculations for applications to the New York State Clean Heat Program. Load calculations are required for all applications for Clean Heat incentives and are subject to review by the Program Administrators. Participating Contractors who choose to perform load calculations that do not meet the criteria outlined in this document may be asked to provide written justification and their projects may be subject to additional review.

1) Methodology

a) Calculations shall be in accordance with ACCA Standard 183-2007 for commercial projects, ACCA Manual J, 8th Edition, for residential projects, or other approved calculation methods in accordance with the Clean Heat Program Manual.

b) Residential equipment sizing shall be based on manufacturers' extended performance tables in accordance with ACCA Manual S, not based on nominal size or AHRI ratings.

c) Each outdoor condensing unit or central system should be sized for the dominant heating or cooling load of its corresponding zone. When multiple central systems condition separate zones within a building, each system should be sized for the dominant heating or cooling load of its zone. Whenever one system or outdoor condenser unit conditions multiple zones within a building (e.g., a VRF system), the block load of the entire space conditioned by that system should be used (which may be smaller than the sum of the individual zone loads).

i) To verify that the block load has been calculated correctly, the project submission should include a complete engineering load calculation report. This report must:

(1) Clearly identify the individual heating and cooling loads for each zone, detailing the inputs for envelope, solar gain, internal loads (lighting, occupants, plug loads), and ventilation consistent with this guidance document.

(2) Demonstrate how the non-coincident timing of these zonal peaks was used to calculate the overall system block load.

(3) Confirm that the selected outdoor unit capacity is based on this calculated block load, not the sum of the individual zone peak loads.

ii) Con Edison requires all Manual J submittals to follow a floor-by-floor load calculation methodology.

2) Temperatures

a) Outdoor design temperatures should be within ±5°F of the Clean Heat program default for the project's location, based on the Clean Heat Weather Station Reference (zip code lookup tool). In cases where the design professional chooses to use a different weather city or different ACCA reference, the design temperatures shall remain within 5°F of the values for 99% heating and 1% cooling, for the site as shown in the CH weather station reference.

i) Design temperature requirements may be superseded by manufacturer-specific requirements. In such cases, Clean Heat applicants must provide documentation citing the applicable manufacturer's requirement.

b) Indoor design temperatures for heating load calculations shall not exceed 72°F, and for cooling shall not be less than 75°F.

3) The following component loads should NOT be included in load calculations:

a) Humidification loads;

b) Hot water piping distribution losses;
c) Adiabatic surfaces (surfaces in which there is no heat transfer; i.e., party walls, within the building or between buildings, floors, or ceilings between conditioned floors);
d) Duct losses/gains, where indoor equipment is ductless or where ducts are located inside conditioned space;
e) Multiplicative or additive safety factors with no defined source.

4) Component load guidance

a) Ventilation loads shall be supported by mechanical schedules. Calculations must account for heat recovery by subtracting the recovered energy from the total ventilation load. The final load calculation should only include the net load the heat pump is required to serve. For example, if the total ventilation heating load is 10,000 Btu/h and the ERV has a sensible effectiveness of 75%, the load calculation for the heat pump should only include the remaining 2,500 Btu/h.

b) Unless otherwise supported by project-specific blower door testing, heating and cooling infiltration shall be:

	Natural ACH heating	**Natural ACH cooling**
Retrofits	≤0.7	≤0.4
Typical new construction and gut rehab	≤0.3	≤0.17
Passive House	≤0.06	≤0.034

c) Clean Heat provides guidance on calculating design infiltration based on blower door testing. See Clean Heat Infiltration Guidance.

d) Enclosure (envelope) component loads should use R values consistent with final architectural plans for new construction or gut rehab and verified existing conditions for retrofit.

i) Category 4A baseline loads should be calculated based on the existing building for retrofit or gut rehab projects and the energy code minimum for new construction projects.
ii) All documented energy-efficient features and specifications shall be accounted for when defining component loads.
iii) For buildings where insulation levels of the envelope are not accessible for inspection, the following defaults can be used:

Vintage	IECC Climate Zone	Wall, Rim Joist	Ceiling	Basement wall	Floor	Window U-factor
Pre-war uninsulated masonry	N/A	4	4	4	4.5	see window defaults in table below
Pre-war uninsulated wood frame	N/A	4.5	4	4.5	4.5	
Prior to 1979	N/A	4.8	11	4.5	4.5	
From 1979 through 2002	N/A	11	19	11	19	
NYS: 2002-2008 IECC **(NYC = Zone 4, 2002-2009)**	4 and **NYC**	**13**	**38**	**9**	**19**	**0.45**
	5	13	38	10	21	0.40
	6	18	38	10	21	0.35
NYS: 2008 through 2009 **(NYC = Zone 4, 2009-2011)**	4 and **NYC**	**15**	**38**	**10**	**19**	**0.40**
	5	21	38	10	30	0.35
	6	21	49	10	30	0.35
NYS: 2010 through 2015 **(NYC = Zone 4, 2011-2015)**	4 and **NYC**	13	38	10	19	0.35
	5	20	38	10	30	0.35
	6	20	49	15	30	0.35

NYS: 2016 through 2019	4	20	49	10	19	0.35
	5	20	49	15	30	0.32
	6	25	49	15	30	0.32
NYC: 2016 through 2019	**NYC**	**25**	49	**25**	**30**	**0.32**
NYS: 2020 through present	4	20	49	10	19	0.32
	5	20	49	15	30	0.30
	6	23	49	15	30	0.30
NYC: 2020 through present	**NYC**	**25**	49	**25**	**30**	**0.27**

Notes: the above values apply to low-rise residential buildings and commercial buildings through 2002 (shaded section). For commercial buildings after 2002, refer to the commercial building code at the time of construction. R-values shown represent minimum values for the whole assembly, including air films. Window U-factors are maximum. If any evidence of additional insulation exists, include that in the load calculations.

iv) For windows without known U-value and SHGC data, the following defaults may be used.

Window property defaults by vintage and window type

Vintage	Glazing	Frame	Storm	U-factor Btu/(hr·°F·ft^2)	SHGC
Older, poorly insulated	single	metal	no	1.2	0.75
	single	wood	no	0.71	0.64
Existing, average insulation	double	metal	no	0.87	0.67
	single	wood/ vinyl	yes	0.57	0.56
	double		no		
	double		yes	0.44	0.51
New construction, replacement windows ≥2005	low e: double	wood/ vinyl	no	0.47	0.31
	low e: triple	any	no	0.31	0.21

Note that window vintage may not match building vintage if windows were previously replaced. Use observed physical description of window glazing, frame type, and presence of storm panel to select the appropriate default.

e) Internal gains above normal levels (e.g., those from industrial process heat) shall be accounted for as offsetting design heating load.
f) Heating load calculations shall account for cold processes or equipment in the zone that absorb heat (for example, indoor unitary heat pump water heaters or some refrigerated cases).
g) Surface areas and geometry of exterior components (thermal envelope) and floor area used in loads must be consistent with architectural plans.

Note: The infiltration guidance document, zip code weather station reference, and other helpful resources can be found at https://cleanheat.ny.gov/contractor-resources/ under the Air Source Heat Pump and Ground Source Heat Pump expanders.