

Performance Pathway Detailed Manual J Input Requirements



NYS Clean Heat



NYS Clean Heat Weatherized Tier Applications

After September 1, 2026, a Clean Heat project may qualify for a Weatherized Tier incentive using one of the following three pathways:¹

- Post-2010 Built/Modern Home Pathway
- Past Participation Pathway
 - For homes that have successfully participated in a weatherization program from a utility or NYSERDA with one of the contractor-installed tiered packages detailed in the Clean Heat Program Manual
- Performance Pathway
 - For homes that demonstrate that they are well-weatherized by having a BHL/sq ft below a defined standard

A home only needs to qualify through one of the three pathways to be eligible for the Weatherized Tier incentive.

The Clean Heat Implementation Plan and Program Manual include further details on eligibility and documentation requirements for the Weatherized Tier Pathways. These details may include measures and packages that would make customers eligible under the Past Participation pathway.

While the approaches to evaluating on-site conditions can apply to any Clean Heat project, the photo documentation procedure is only required for Weatherized Tier Performance Pathway applications for the Upstate Utilities.² The Performance Pathway verification process for Con Edison is described in the NYS Clean Heat Program Manual.

Any significant variance between modeled conditions and post-installation QA/QC findings may result in corrective action, including disciplinary measures, in accordance with the Upstate Utilities Quality Policies and Procedures.

Homes that demonstrate that they are well-weatherized by having a building heating load per square foot (BHL/sq ft) below a defined standard outlined in Table 1 below.

Table 1: Performance Pathway Building Heating Load per Square Foot Standards for Upstate Utilities

Conditioned Square Footage	BHL / SF
< = 999	30
> = 1,000 and < 1,999	25
> = 2,000	20

1. Additional details regarding the three pathways of the Weatherized Tier, including further information on eligibility requirements for each pathway, are included in the New York State Clean Heat Heat Pump Program Manual, as available on www.nyscleanheat.com.

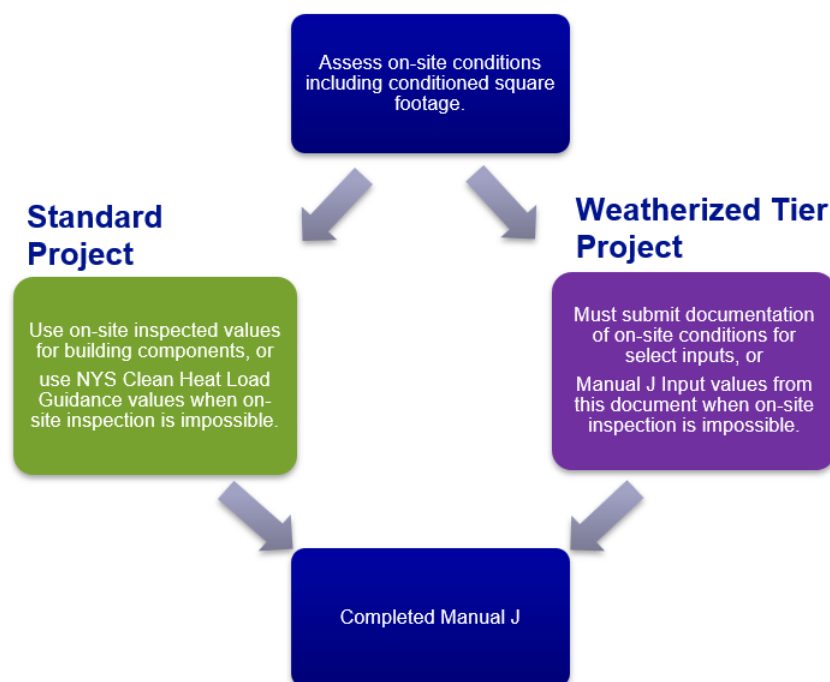
2. The Upstate Utilities consist of Central Hudson, National Grid, NYSEG, Orange & Rockland, and RG&E

Detailed Manual J Input Requirements to be Submitted with Clean Heat Weatherized Tier Performance Pathway Applications for the Upstate Utilities

For Clean Heat Weatherized Tier Performance Pathway applications, additional scrutiny is required for some Manual J calculation inputs for the building envelope, windows, and air leakage. Participating Contractors (PCs) must either submit photo documentation of the specified inputs used in the Manual J calculation for validation using the Performance Pathway Detailed Manual J Input Photo Template or use the Manual J input values specified in this document. These Manual J inputs may be used by the program implementation vendor, ICF, to complete technical review of each application to ensure compliance with program rules.

- Building envelope: insulation and areas
- Windows: thermal properties and areas
- Air Infiltration

Process Diagram



Building Envelope Insulation

PC Inspection to Establish Existing Insulation Levels

PCs must inspect existing insulation levels to the extent possible in each of these areas of the home to determine the R-values to be used in Manual J calculations:

- Exterior walls
- Floors separating conditioned and unconditioned spaces
- Ceilings separating conditioned and unconditioned spaces (generally the attic floor or ceiling between the attic and top living area of the home)
- Insulated roofs

PCs are not required to open walls, floors, or other areas of the home to assess insulation levels. PCs must follow these steps and take photos of their visual inspection to confirm insulation levels in each area of the home. These pictures must be submitted in the Performance Pathway Detailed Manual J Input Photo Template for Weatherized Tier Performance Pathway applications.

PCs must use the typical R-values in Tables 2-4 to calculate the R-value of existing insulation in each area of the home for use in Manual J calculations.

Table 2: Typical Insulation R Values: Batt, Blanket, and Loose Fill Insulation

Insulation Material	Typical R-Value Per Inch
Fiberglass batt (standard density)	R 3.2
Fiberglass batt (high density, where identified by markings)	R 3.8
Blown in fiberglass	R 2.2
Cellulose (loose fill, such as attic floor)	R 3.2
Cellulose (dense pack, such as wall cavities)	R-3.8
Mineral wool / Rock wool	R 3.8

Table 3: Typical Insulation R-Values: Spray Foam

Insulation Material	Typical R-Value Per Inch
Open cell spray polyurethane foam	R 3.7
Closed cell spray polyurethane foam	R 6.0
Medium density / hybrid spray foam	R 5.0

Table 4: Typical Insulation R-Values: Rigid Board and Continuous Insulation

Insulation Material	Typical R-Value Per Inch
Polyisocyanurate (Polyiso)	R 7
Extruded polystyrene (XPS)	R 5.0
Expanded polystyrene (EPS)	R 4

To more accurately assess existing conditions, wall thickness is usually visible and may be measured at a door or window jamb. PCs may also be able to assess insulation levels behind light-socket wall plates or asking the homeowner for photos of prior work performed.

For cathedral ceilings, check for thickness at skylights or transition points. Check for insulation type if accessible behind recessed lighting, when visible from adjacent attic, or construction documents.

Default Insulation Values

If project-specific values cannot be verified on-site by the PC, these default values are the lowest R-values (highest U-values) that can be used in Manual J calculations for all Clean Heat Weatherized Tier applications. If PCs use a higher R-value than indicated in the table, they will need to use the inspection process outlined in the previous section (PC Inspection to Establish Existing Insulation Levels) and provide photo supporting evidence using the Performance Pathway Detailed Manual J Input Photo Template

Table 5: Insulation Default R-Values³

Building Vintage	IECC Climate Zone	Wall, Rim Joist	Ceiling	Basement Wall	Framed Floor
Pre war uninsulated masonry (total R-value of assembly)	N/A	4	4	4	4.5
Pre war uninsulated wood frame (total R-value of assembly)	N/A	4.5	4	4.5	4.5
Prior to 1979 (total R-value of assembly)	N/A	4.8	11	4.5	4.5
From 1979 through 2002 (insulation R-value)	N/A	11	19	11	19
NYS: 2002–2008 IECC (insulation R-value)	5	13	38	10	21
	6	18	38	10	21
YS: 2008–2009 (insulation R-value)	5	21	38	10	30
	6	21	49	10	30
NYS: 2010-2015 (insulation R-value)	5	20	38	10	30
	6	20	49	15	30

3. U value and R value can be converted using $U = 1/R$ and $R = 1/U$

Combination of Default Values and PC Inspection for Insulation

PCs may apply a combination of default values for some areas of the home and project-specific values for other areas of the home. For areas of the home where default values will be applied for insulation, PCs must use the default values in Table 5 for the corresponding building vintage, climate zone, and insulated area of the home (e.g., attic, walls, etc.).

Photo Documentation Requirements for Insulation Existing Conditions

For Clean Heat Weatherized Tier applications using project-specific values, a participating contractor upload photos into the Performance Pathway Detailed Manual J Input Photo Template.

In general, the photos for each insulation component of the home must include:

- A wide shot establishing the location in the home
- A close-up photo of the insulation material that also clearly shows the type and depth or amount of insulation

Windows

PC Inspection of Existing Windows

For Clean Heat Weatherized Tier Performance Pathway applications, PCs may use project-specific values for windows that meet the criteria listed below for Manual J calculations.

The window type may be established by model number or NFRC values if available.

For PCs inspecting windows to determine project-specific values for Manual J calculations, use the observed physical description of window glazing, frame type, and presence of a storm panel to select the appropriate default. Note that window vintage may not match building vintage if windows were previously replaced.

Double-pane windows can be confirmed by the presence of the edge spacer. Low-e coatings can usually be identified by a distinct green, blue, or orange color visible in the reflection of one of the inside surfaces (2 or 3) of glass, when viewed at an angle with a typical smartphone flashlight or similar point-source light. The window assembly frame type (e.g., wood, metal, vinyl, etc.) should also be noted and entered in the Manual J software as well as orientation in the building (i.e., North, South, East, or West).

Default Window Values

If project-specific values cannot be provided by the PC, these default values are the highest U-values for each window type that are permitted in Manual J calculations for all Clean Heat Weatherized Tier Performance Pathway applications.

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

Table 6: Window Property Default Values for Windows By Vintage and Window Type

Vintage	Glazing	Frame	Storm	Maximum U-factor Btu/(hr·°F·ft²)	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	Wood/Vinyl	No	0.57	0.56
	Double	Wood/Vinyl	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

Combination of Default Values and PC Inspection for Windows

PCs may apply a combination of default values for windows in some areas of the home and project-specific values for windows in other areas of the home, where specific values are known for some windows. For areas of the home where default values will be applied for windows, PCs must use the default values in Table 6 for the corresponding building vintage and window characteristics.

Photo Documentation Requirements for Window Existing Conditions

For Clean Heat Weatherized Tier Performance Pathway applications using project-specific values, a participating contractor upload photos into the Performance Pathway Detailed Manual J Input Photo Template.

- Contractors must provide photo documentation of the type of window(s), clearly depicting the type of window and number of panes. Window type may be established by model number or NFRC lookup if available.

Air Infiltration

For air infiltration values in Manual J calculations, PCs may use the visual infiltration classes shown below. As an alternative, PCs may conduct a blower door test to determine the ACH50 of the home. Pictures of the blower door test setup and results must be submitted in the Performance Pathway Detailed Manual J Input Photo Template.

Selecting Tight or Semi-Tight will require photo documentation of air sealing being present.

Visual infiltration classes⁴

- Tight Home
 - o Sealed seams, joints, and penetrations especially at attic bypasses such as plumbing or chimney chases, wiring penetrations, etc.
 - o Tight backdraft dampers, direct vent gas appliances, sealed fireplace
 - o Sealed ductwork, high-quality weather stripping, gaskets on doors/windows/attic hatches
 - o Minimal air movement
 - o Single-story modular home with marriage wall well-gasketed or well-sealed with spray foam
- Semi-Tight Home
 - o Reasonably sealed building envelope, some penetrations are sealed, but not thoroughly completed
 - o Functional weatherstripping
 - o Rarely noticeable drafts near windows, doors, or attic hatches
 - o Single-story modular home with marriage wall gasket compromised, or partly sealed with spray foam
- Average Home
 - o Marginal effort to seal the building envelope
 - o Backdraft dampers
 - o Combustion appliances drawing air from inside the home
 - o Slightly worn weatherstripping or older windows
 - o Attic hatch lacks a functional gasket but is tight
 - o Drafts noticeable on windy days, but not year round
- Semi-Loose Home
 - o Noticeable air leakage, though cracks and seams may not be visible
 - o Clues:
 - Dirty discolored attic insulation
 - Clunky, poorly closing exhaust fan damper
 - Moving cobwebs in the basement
 - Same rooms often feel drafty
- Loose Home
 - o Very drafty, especially on windy days
 - o No effort made to seal the building envelope
 - o Clues:
 - Visible daylight through cracks
 - Unsealed wall penetrations for utilities, plumbing, or cables
 - Open combustion appliances and fireplaces

4. Based on ACCA guidance

Photo Documentation Requirements for Air Infiltration Existing Conditions

For Clean Heat Weatherized Tier Performance Pathway applications using project-specific values, a participating contractor upload photos into the Performance Pathway Detailed Manual J Input Photo Template.

Contractors must provide photo documentation supporting the visual infiltration categories of Tight or Semi-Tight.

Additional Load Guidance

The following sections are not required to be documented on the Performance Pathway Detailed Manual J Input Photo Template.

Conditioned Square Footage

A building's thermal envelope is defined as the barrier between the indoor and outdoor environments, including walls, windows, doors, roof, foundation, etc. Conditioned square footage is the floor area within the boundaries of the building's thermal envelope that is to be heated and cooled by the heat pump system. Areas such as basements, crawl spaces, and garages that are not to be heated and cooled by the heat pump system should be excluded. Those unconditioned areas must be accounted for in the ACCA approved Manual J software as appropriate to account for heat gains and losses from adjacent walls or floors. PCs should use this approach to determine the conditioned square footage that is used in Manual J calculations.

Exterior walls are to be entered into Manual J software with appropriate locations, construction types and insulation values. Interior walls are considered partitions and should not be entered.

A floor over unconditioned space, such as an unconditioned basement, needs to be entered as a partition over an unconditioned basement.

A floor exposed to outdoor air (e.g., over an open crawlspace, open garage, carport, wall overhang, etc.) is considered an exposed floor and shall be entered as such in the Manual J software.

A ceiling below a ventilated attic is to be entered into Manual J software with appropriate construction and insulation values.

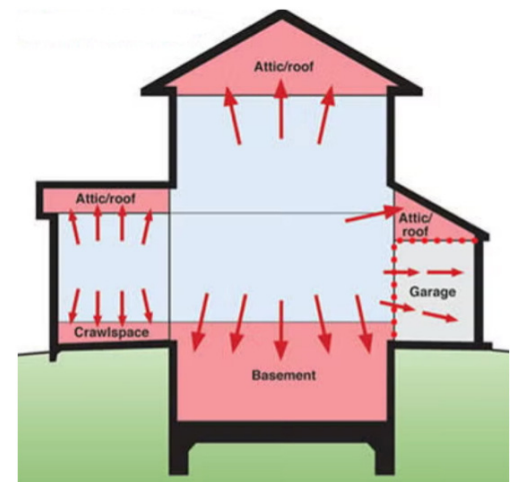
If ceiling heights are uniform throughout the building, PCs must take at least one measurement to determine the ceiling height to be used for the entire building. If ceiling heights vary significantly in certain parts of the building such as a great room with higher ceilings, then the PC must measure the ceiling height of those rooms separately and add to the rest of the building to ensure accurate total volume is calculated.

Buildings with cathedral or vaulted ceilings must be treated separately from flat ceilings in Manual J calculations as they represent a different ceiling assembly type, often with different insulation levels and greater surface area, greater volume, and higher heat gain/loss.

Other Load Calculation Requirements

The following component loads shall NOT be included in load calculations:

- Humidification loads
- Hot water piping distribution losses
- Adiabatic surfaces (surfaces for which there is no heat transfer, such as party walls within the building or between buildings, or floors or ceilings between two conditioned spaces)
- Duct losses or gains, where indoor equipment is ductless or where ducts are located inside conditioned space.
- Multiplicative or additive safety factors with no defined source.



Ventilation Loads

- Ventilation systems shall be verified by site review when included in the load calculation.
- Ventilation systems include continuously-operating, automatically controlled fresh air ventilation systems such as heat or energy recovery systems, exhaust only fan systems, or automatically-controlled outdoor air dampers in central HVAC systems.
- Ventilation loads shall account for heat recovery by subtracting the recovered energy from the total ventilation load. The final load shall 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 or HRV has a sensible effectiveness of 75%, the load calculation for the heat pump should only include the remaining 2,500 Btu/h.
- Intermittent bathroom and kitchen exhaust fans operated by wall switches, short-term delay timers, humidity sensors, or similar “on demand” controls shall not be included in load calculations unless they are operated as part of a dedicated, continuous fresh air ventilation system.

Photo Submission Template

The Performance Pathway Detailed Manual J Input Photo Template is available at [NYSCleanheat.com](https://nyscleanheat.com)