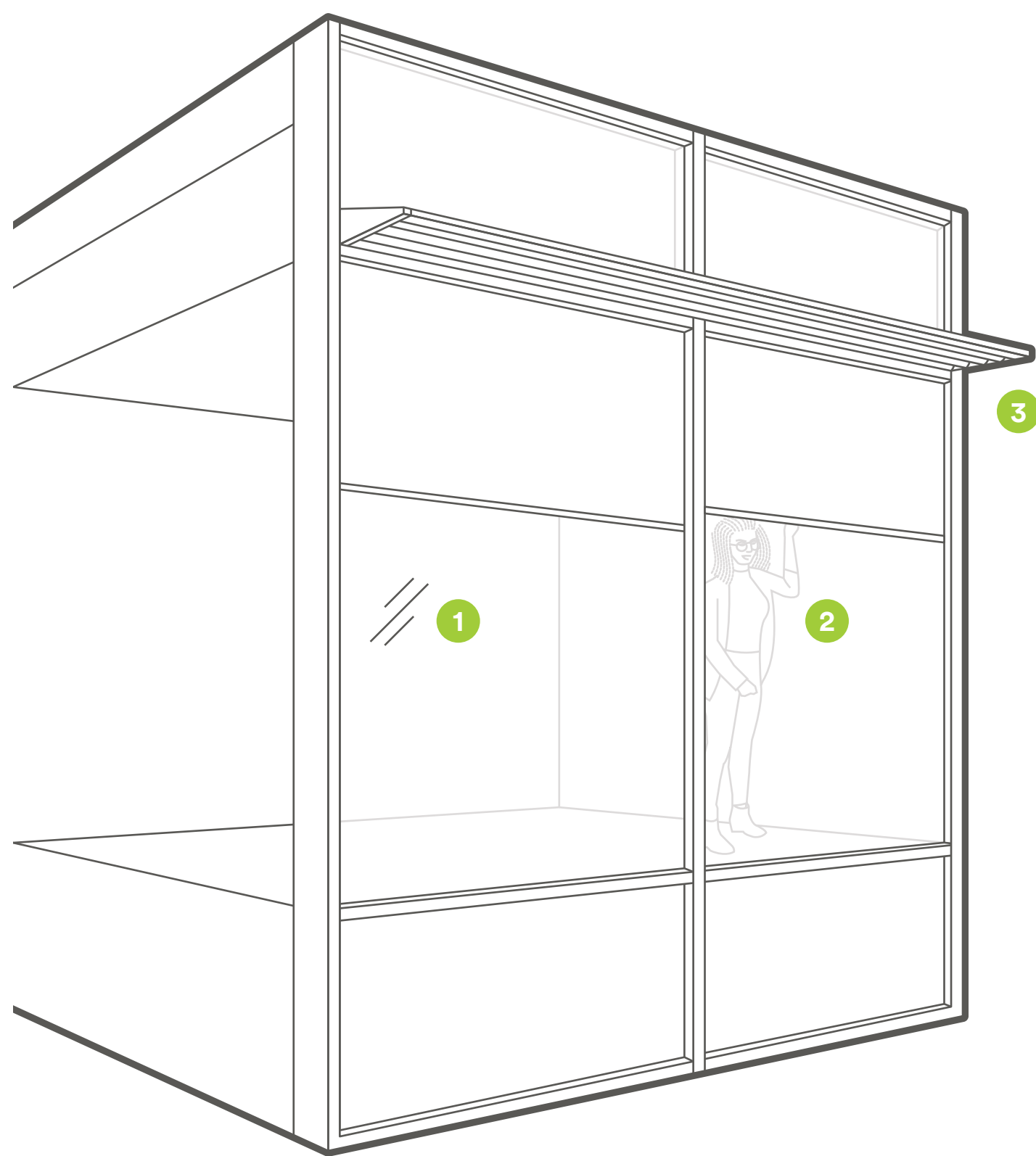


# high performance windows and doors

Windows and doors are often poorly insulated and installed, leading to drafts, unwanted heat transfer, and moisture problems due to condensation.

High performance windows and doors are well-insulated and airtight, featuring thermally broken frames with continuous gasketing, triple glazing with insulating gas between each layer, robust hinging and locking mechanisms, and specialized transparent coatings that reduce unwanted heat transfer. These windows and doors typically exceed local energy conservation code requirements and some achieve Passive House component certification, an exemplary standard for energy performance.

## typical curtain wall construction



For typical all-glass curtain wall construction, solar heat gain through glazed windows and skylights is unavoidable and can degrade energy performance and comfort. If re-cladding the façade is not viable, applying low-emissivity (low-e) coatings and introducing interior and exterior shading can help lower heating and cooling loads.

### 1 Low-E Coating

Low-emissivity (low-e) coatings reduce the transmission of solar thermal radiation through windows, preventing unwanted heat gain and protecting occupants from harmful UV rays.

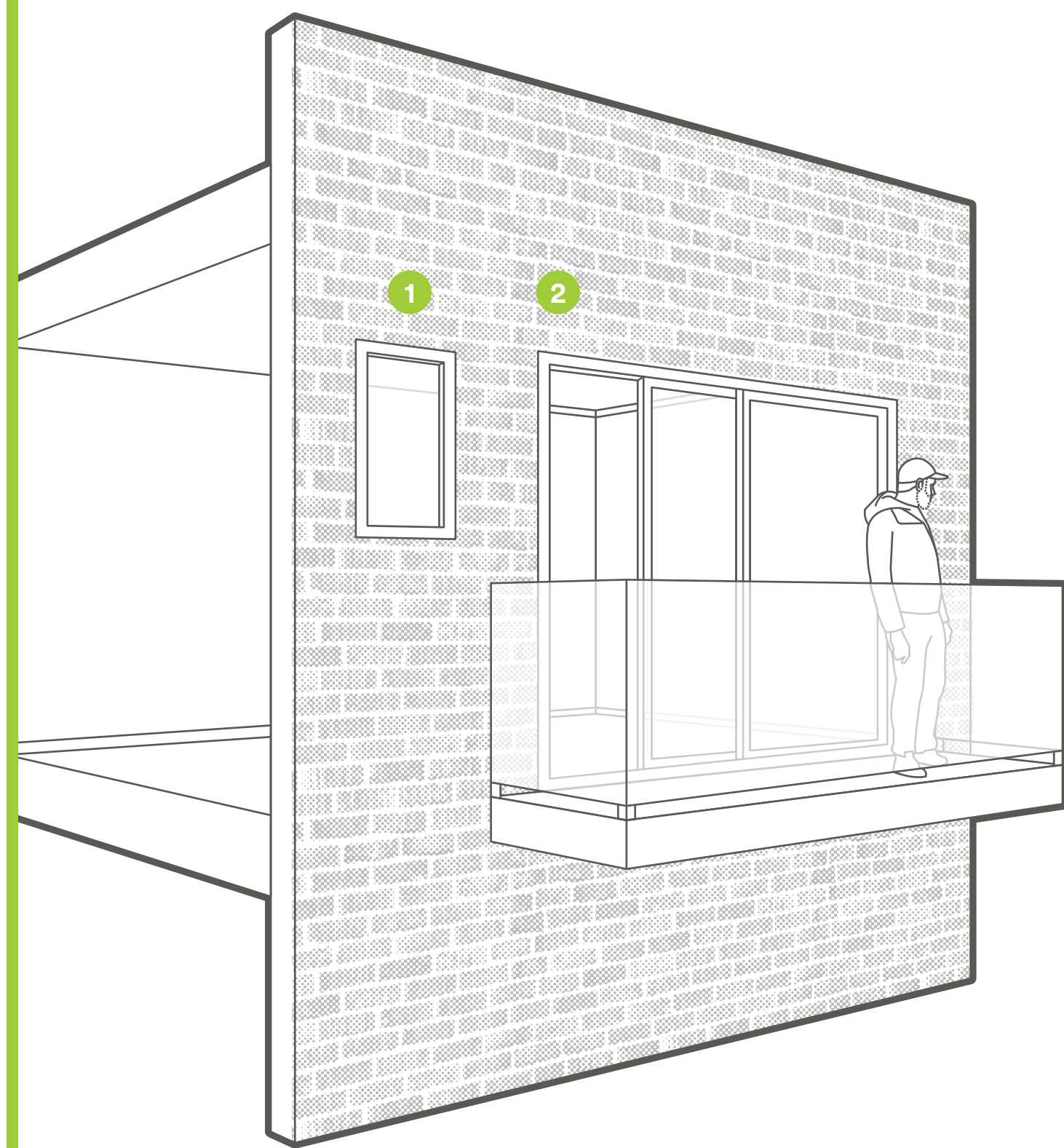
### 2 Interior Shading

Automatic shading systems that adjust in response to sunlight significantly reduce a space's cooling needs.

### 3 Exterior Shading

Exterior shading devices reduce solar heat gain by blocking direct sunlight, particularly during summer months.

## typical masonry veneer wall construction



For typical masonry or stone wall construction, priorities include properly aligning windows and doors and coordinating installation with thermal, air, water, and vapor barriers.

### 1 Window Frames

Window frame type has a significant impact on airtightness. Casement windows with robust hinging and closure mechanisms are much less prone to air leakage than double hung or sliding windows.

### 2 Window Frame Materials

Window and door frames made of low-conductivity materials such as wood, vinyl, or fiberglass reduce the amount of heat transferred through the building envelope. Frames with thermal breaks—components that prevent the flow of thermal energy—aligned with wall insulation are critical.