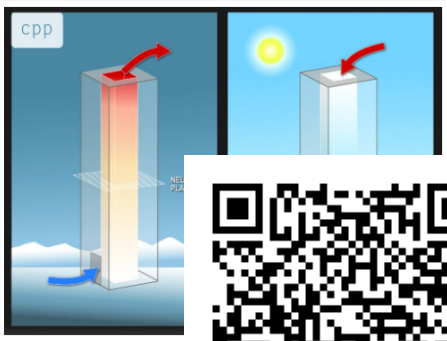
Natural cooling strategies

Buildings traditionally rely on mechanical air conditioning to ensure occupant comfort and safety during hot weather. But such mechanical systems can sometimes be downsized or eliminated altogether when engineers and architects integrate the local climate into the design.

Natural cooling depends on a systems approach, in which many aspects of building design work together to keep an occupied space comfortable. Some components of an effective natural cooling strategy include the following.

- **Climate and latitude-specific design.** A detailed understanding of variations in weather patterns and a site's location lets designers take advantage of specific phenomena like seasonal winds, sun angles, and total insolation.
- **Wind-driven ventilation.** Under the right wind conditions, building openings can be strategically opened and closed to encourage cross ventilation.
- **Buoyancy-driven ventilation.** During periods of calm, designers can take advantage of the so-called stack effect, which is based upon warm air's tendency to rise. With the right ceiling outlets and ground-level inlets, the difference in pressure can be enough to



Adaptive Comfort Models

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Adaptive comfort models, such as desrcibed in ASHRAE 55-2013 and ISO 7730, account for variations in human behaviour throughout the year to outdoor elements prior entering the building.

Adopting comfort mod

Establishing natural

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