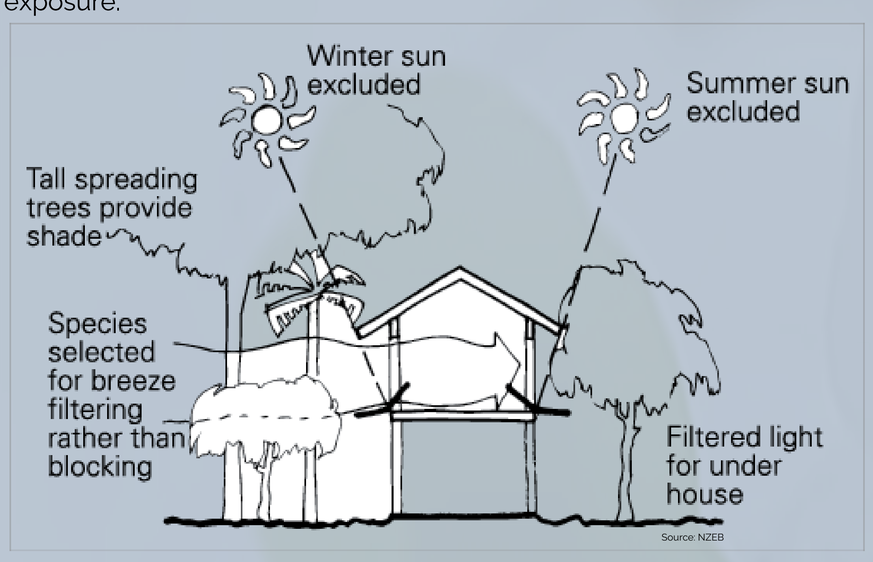
City Actions to Tackle Extreme Heat

BEBRIT
Extreme Heat Risk Project

REGULATIONS TO KEEP BUILDINGS COOL

Building Orientation and Design

Orientation:
Maximize North-South Exposure: Minimize east and west exposures to reduce direct sunlight and overheating.
Shading:
Use overhangs, awnings, and pergolas to provide shade on windows and walls.
Building Shape:
- **Compact Shape:** Reduces surface area exposed to the sun.
- **Height-to-Width Ratio:** Promotes natural ventilation and minimizes sun exposure.



Source: NZEB

Building Envelope

Insulation:
- **High R-Value Insulation:** Use in walls, roofs, and floors to reduce heat transfer. (IECC - USA, NECB - Canada)
- **Reflective Roofs:** Use cool roofs with reflective coatings. (IECC - USA, EPBD - EU)

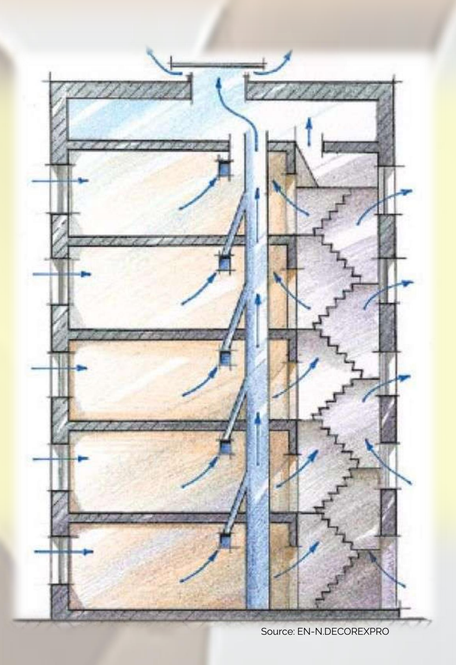
Windows and Glazing:
- **Double or Triple Glazing:** Energy-efficient windows with low-emissivity (Low-E) coatings. (ASHRAE 90.1 - USA, EPBD - EU)
- **Window Films:** Reflective or tinted films to reduce solar heat gain.

Materials:
- **Thermal Mass:** Use materials like concrete or brick to absorb and release heat slowly.
- **Cool Materials:** Select exterior finishes that reflect more sunlight.

Ventilation

:**Natural Ventilation**
- **Cross-Ventilation:** Place windows and vents on opposite sides for airflow.
- **Ventilation Shafts:** Promote natural air movement.

Mechanical Ventilation:
Energy Recovery Ventilators (ERVs): Recover cooling energy from exhaust air. (IECC - USA, EPBD - EU)
Ceiling Fans: Enhance air circulation and reduce air conditioning needs.


Source: EN-N.DECOREXPRO

Landscaping

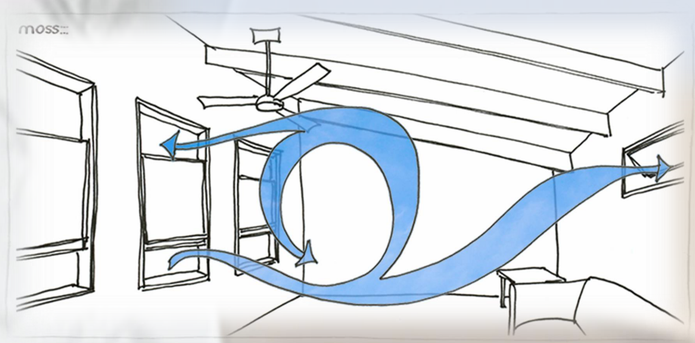
Green Roofs and Walls:
- **Green Roofs:** Vegetated roof systems for insulation and reduced heat absorption. (LEED - USA/Canada, BREEAM - UK)
- **Green Walls:** Vertical gardens to shade walls and reduce heat gain.

Shade Trees and Plants:
- **Deciduous Trees:** Provide summer shade and allow winter sunlight.
- **Ground Cover:** Reduce heat reflection and absorb less heat.

Passive and Active Cooling Systems

Passive Cooling:
- **Evaporative Cooling:** Use water features or misters for cooling.
- **Nighttime Ventilation:** Allow cooler night air into the building.

Active Cooling:
- **High-Efficiency Air Conditioners:** Install units with high SEER ratings. (ASHRAE 90.1 - USA)
- **Variable Refrigerant Flow (VRF) Systems:** Efficient and customizable cooling. (NCC - Australia)



Energy Codes and Standards

Building Codes:
- **IECC (International Energy Conservation Code):** Used by many US states and municipalities.
- **ASHRAE 90.1:** Baseline standard for energy efficiency in the US.

Green Building Certifications:
LEED (Leadership in Energy and Environmental Design): Promotes sustainable practices globally.
BREEAM (Building Research Establishment Environmental Assessment Method): Used in the USA, UK and parts of Europe.
NABERS (National Australian Built Environment Rating System): Australia
CASBEE (Comprehensive Assessment System for Built.
Environment Efficiency): Japan.
ECBC (Energy Conservation Building Code): India.
GRIHA (Green Rating for Integrated Habitat Assessment): India.

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