



# Indoor Environmental Quality

## Conducting an IAQ investigation

- Treat IAQ concerns seriously and promptly.
- Collect health complaint data using a questionnaire specific for your workplace. You may need assistance from an expert.
- Look for patterns.
- Meet affected people to clarify your findings.
- Check the heating, ventilating and air-conditioning (HVAC) system with the building operator/engineer.

### Indoor Air Quality

**Sources**

- Building occupants
- Building materials
- Carpets, fabric, foam chair cushions
- Off-gas emissions furniture, carpets, paints, workplace cleaners, solvents, pesticides, disinfectants and glues
- Damp areas, stagnant water and condensate pans
- Photocopiers, electric motors, electrostatic air cleaners

**Indoor air contaminants**

- Carbon dioxide, tobacco smoke, perfume, body odours
- Dust, fibreglass, asbestos, gases
- Dust mites
- Gases, vapours, odours, volatile organic compounds (VOCs)
- Microbial contaminants, fungi, moulds, bacteria
- Ozone

**Symptoms**

- Dryness and irritation of the eyes, nose, throat, and skin
- Headache
- Fatigue
- Shortness of breath
- Hypersensitivity and allergies
- Sinus congestion
- Coughing and sneezing
- Dizziness
- Nausea

People generally notice their symptoms after several hours at work and feel better after they have been away from the building.

**IAQ issues**

- Lack of outdoor air for HVAC system
- Poorly designed or maintained HVAC system
- Pollutants from the outdoor air
- Emissions from inside sources
- Poor temperature and humidity control

**Common Causes**

- Take a preventative approach to IAQ
- Provide an adequate volume of outdoor air
- Ensure that air is properly distributed
- Prevent outdoor pollutants from entering the building
- Provide separate ventilation for special-use areas
- Promote the use of unscented products
- Choose building materials, paints and furniture with low emissions
- Discourage mould growth
- Follow standards and best practices for your building's ventilation, thermal comfort, and pollutant control



Imaginary Floating Air Filter

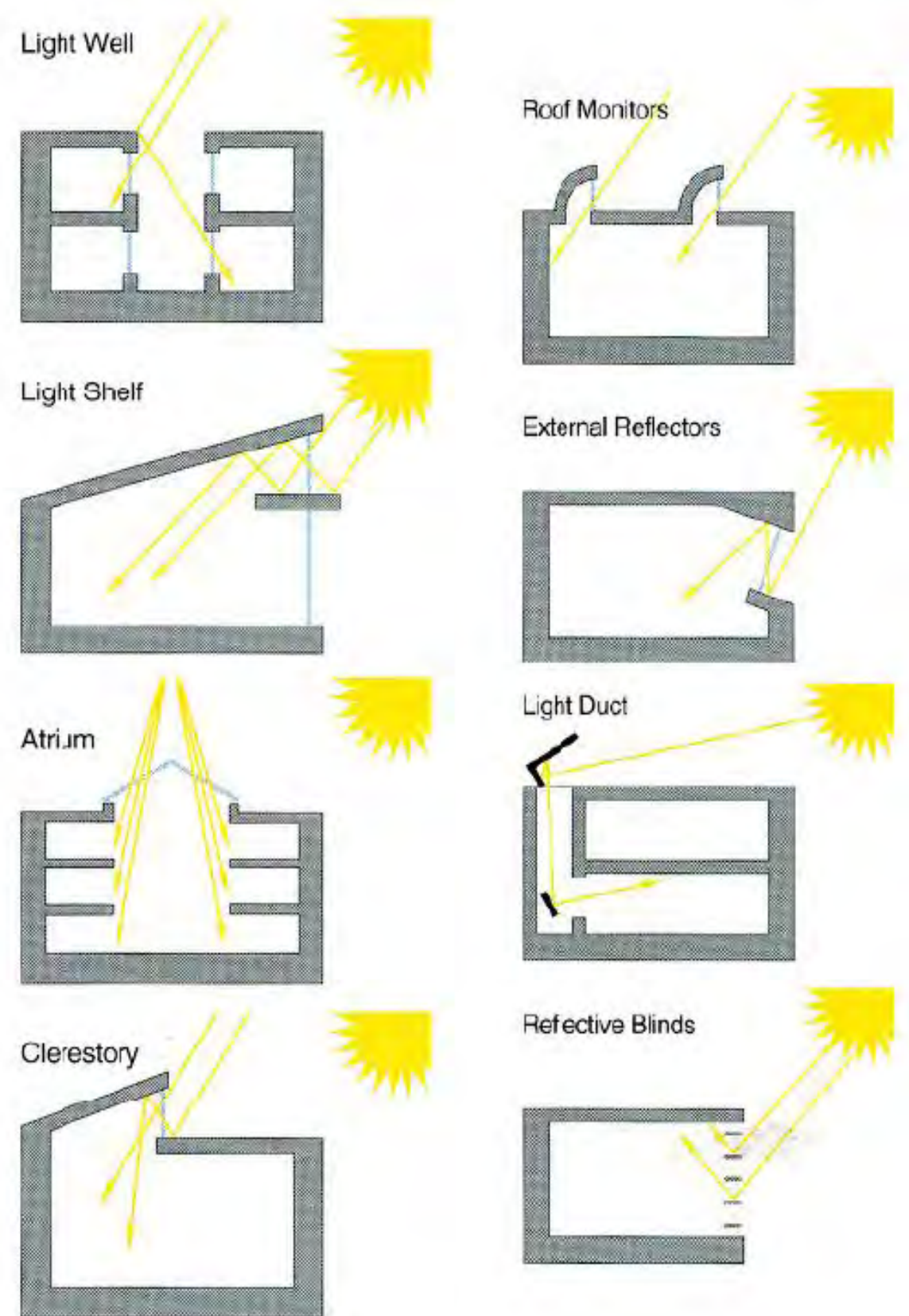


Source of Indoor Air Pollution

**What the law says:** All jurisdictions include the 'general duty clause' which requires employers to provide a healthy and safe workplace. This includes the provision of healthy indoor air. In addition, IAQ is implied in most building codes as design and operation criteria.

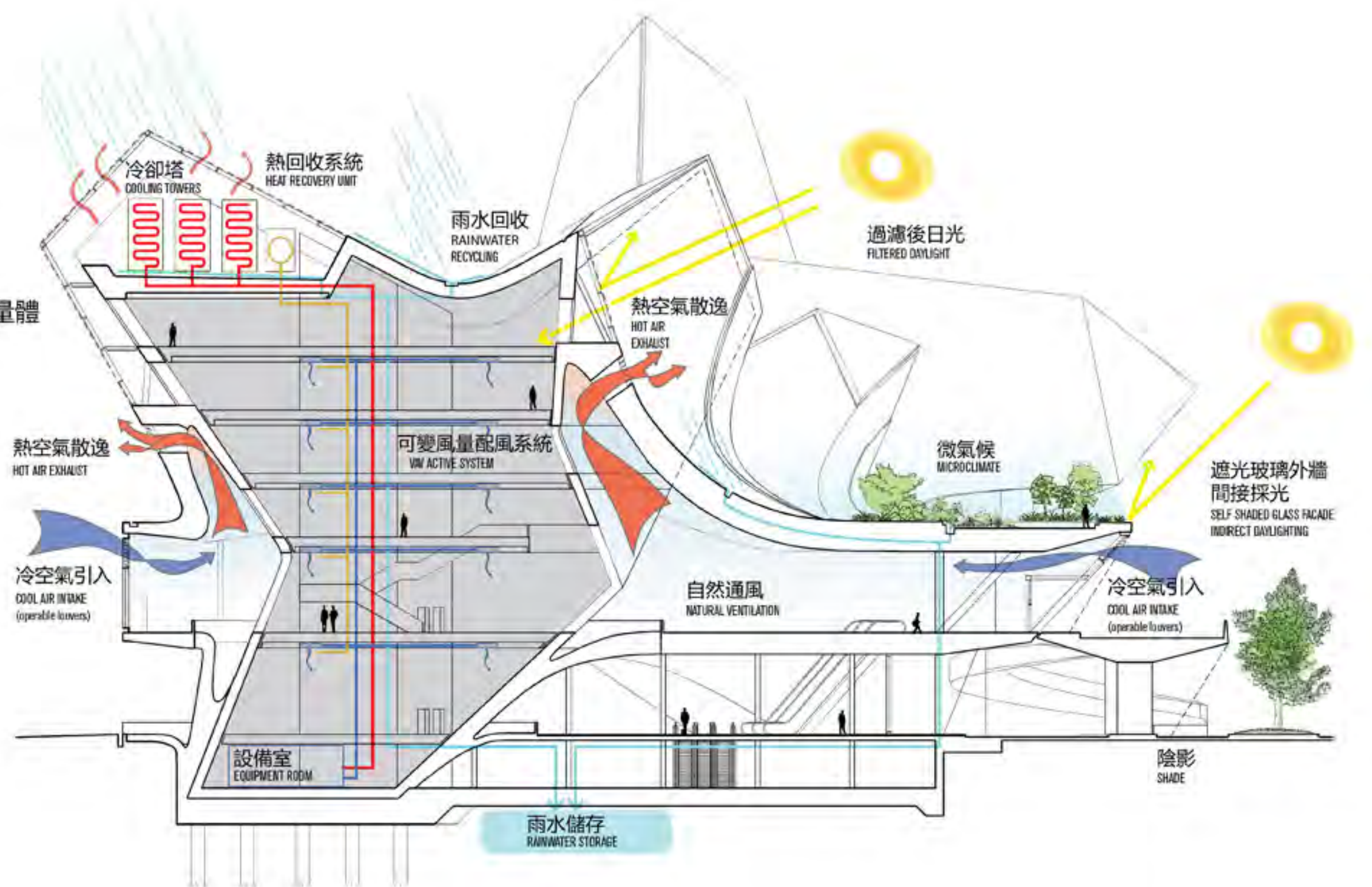
**CCOHS.ca**  
Canadian Centre for Occupational Health and Safety

## Measures of Monitoring Indoor Air Quality

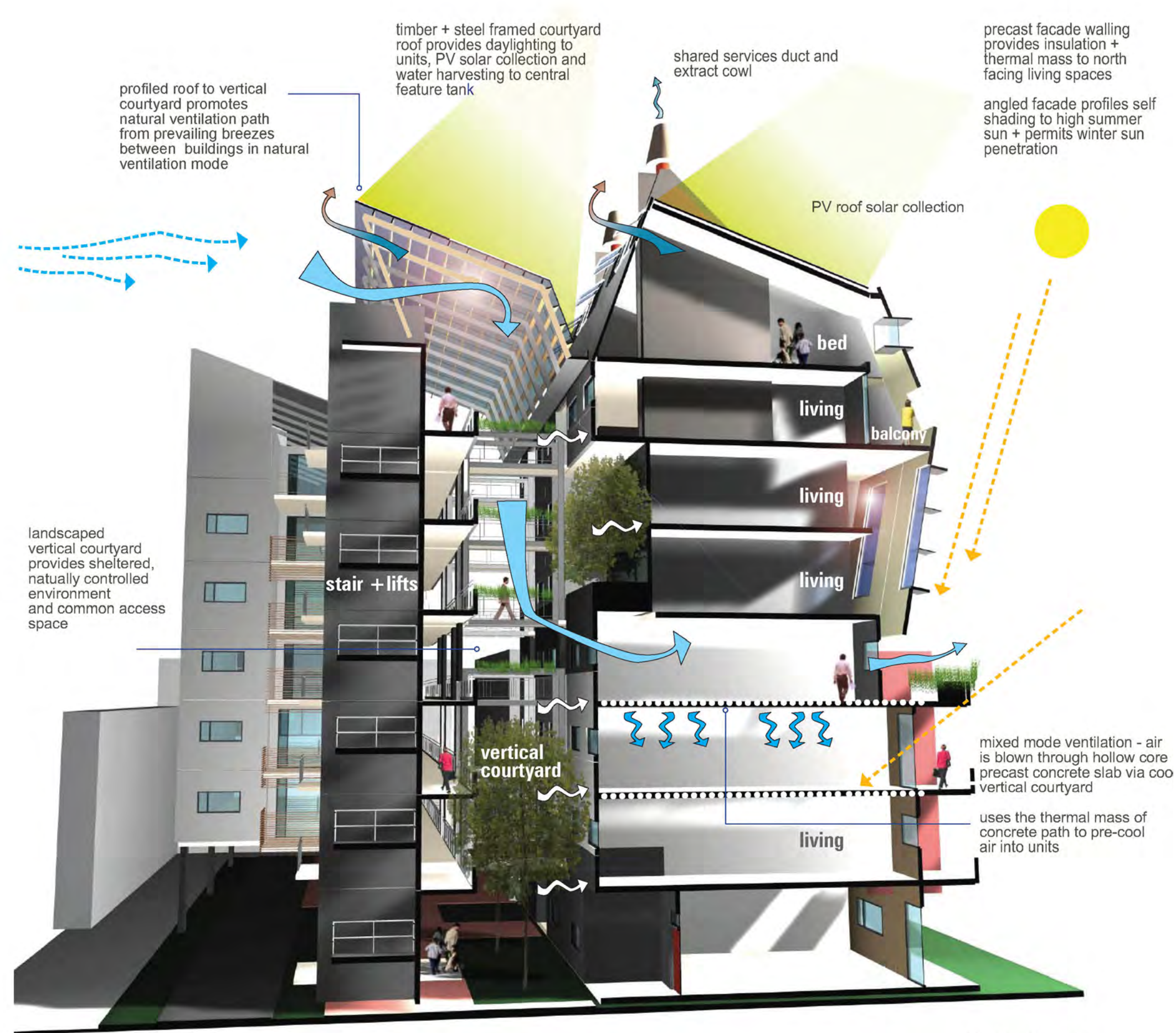


Aperture Design & Natural Sunlight

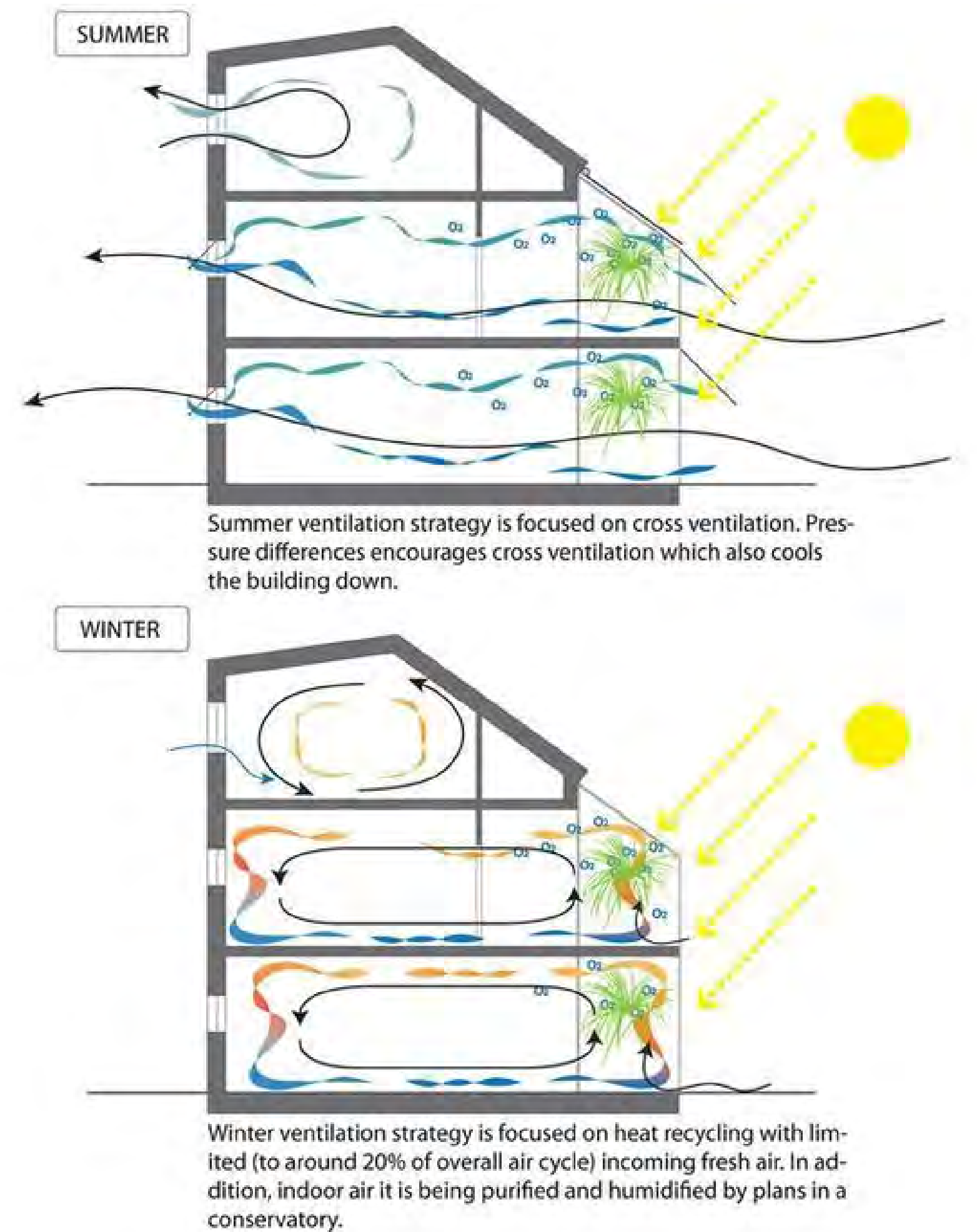
- 自然通風: 出境大廳**  
Natural Ventilation: Departure Hall  
十一月至三月間可降低空調負荷  
November-March used to reduce AC load  
天氣濕熱的月份使用空調系統  
During hot/humid months, conventional AC is used  
煙囪效應被動散熱  
Stack Effect passively exhausts heat
- 可變風量配風系統: 結晶量體**  
VAV Active system: Crystals  
中央空調系統  
AC based on air-air VAV system  
出境大廳為結晶量體緩衝區  
Crystals buffered by Departure Hall  
控制辦公空間溫度及濕度  
Controlled temperature/humidity in Offices
- 屋頂微氣候**  
Microclimate on Roof  
屋頂綠化步道  
Roof Greenway  
保護區, 生物多樣性  
Sanctuary, Biodiversity  
提供更舒適的步行環境  
Sun and wind protection
- 雨水回收**  
Rainwater Recycling  
經由屋頂綠化步道和表皮縫隙收集  
Collected in Roof Greenway and gaps seams in roof  
用於灌溉和建築中水系統  
Used for irrigation and building greywater  
儲存於地下室  
Stored in sub-basement



Passive Sunlight and Ventilation Strategy



Passive Design of Ventilation and Sunlight



Natural Ventilation in Summer and Winter