APEGM

The Manitoba Hydro Downtown Office Project

October 11, 2005

Vision for Project

Manitoba Hydro's new head office in downtown Winnipeg will be a state-of-the-art, energy efficient, cost-effective structure that embodies and demonstrates Manitoba Hydro's commitment to sustainable development.

While meeting the business needs of Manitoba Hydro, the office building will have a positive impact on the sustainable future of Winnipeg's downtown and be a source of pride for Manitobans.

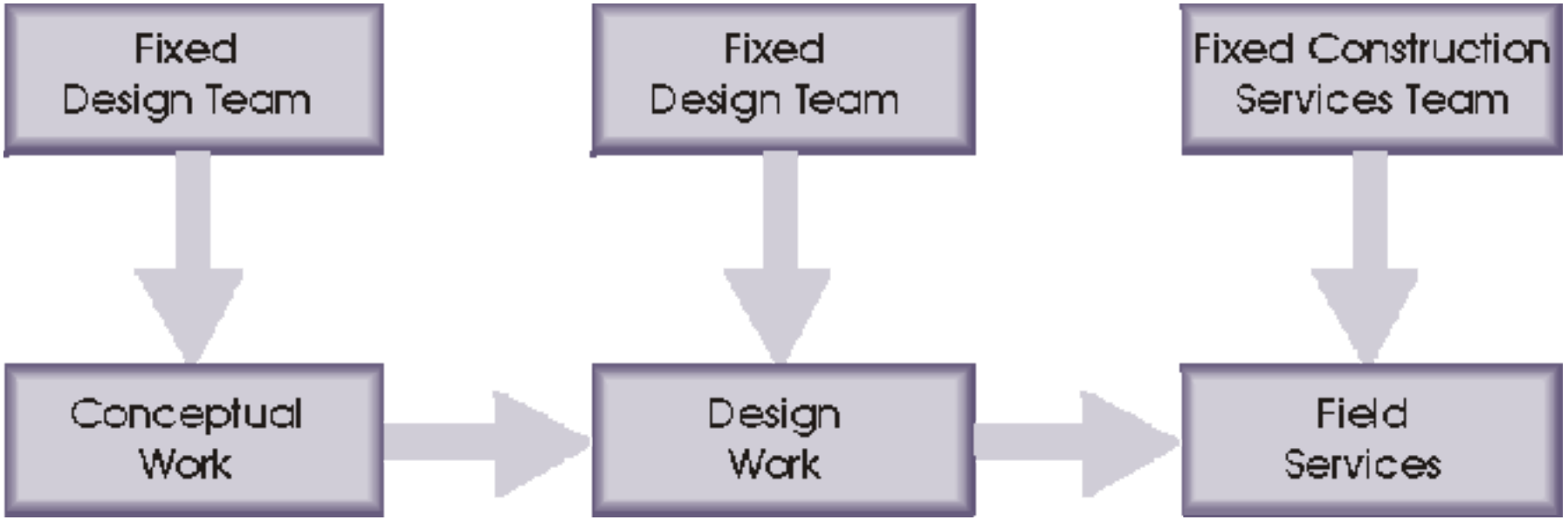
Project Charter

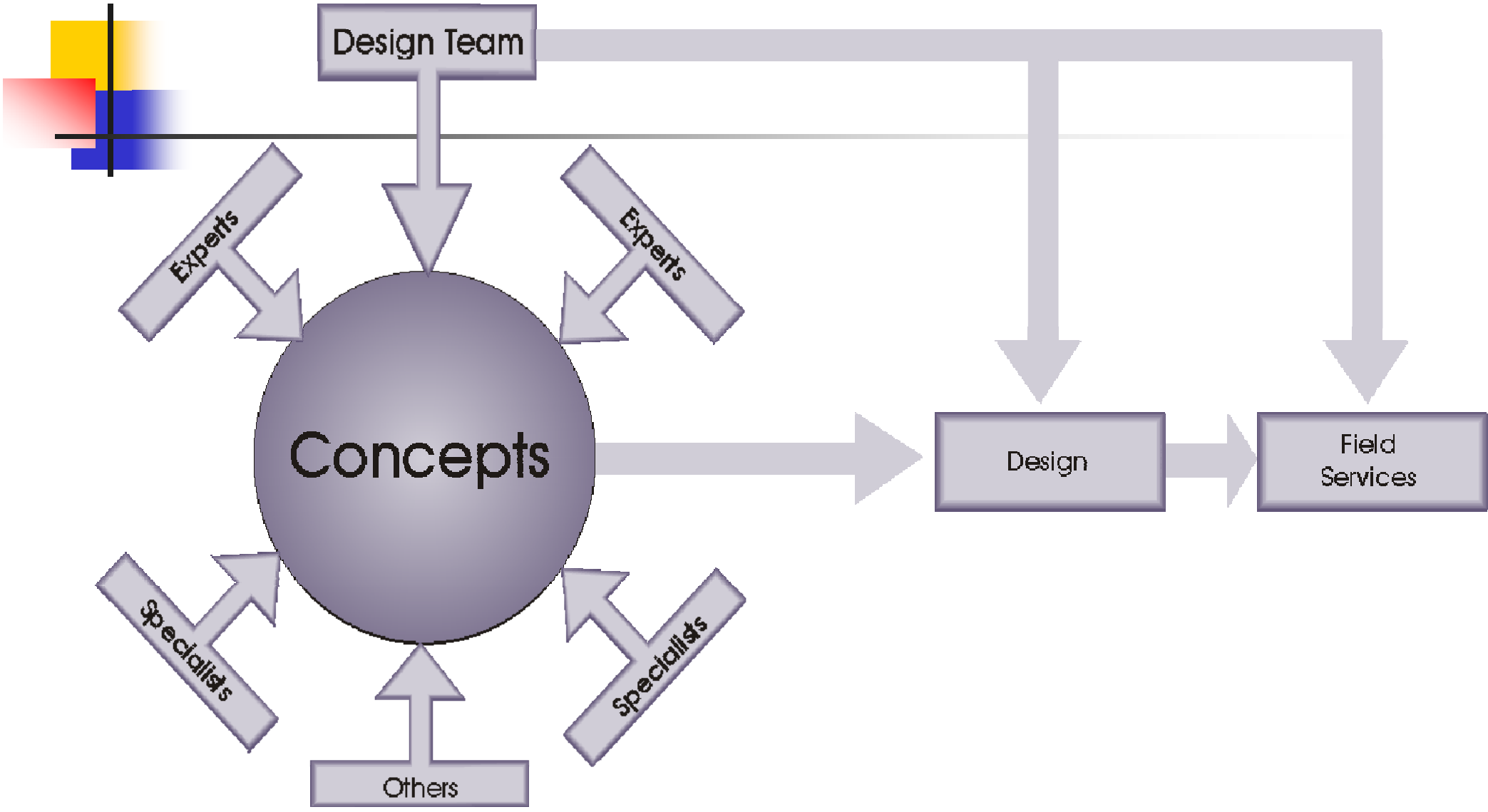
1. Healthy and Productive Work Space
2. Global Standard in Energy Efficiency
3. Global Standard in Sustainability
4. Signature Architecture
5. Positive Impact for Downtown Winnipeg
6. Life Cycle Costs

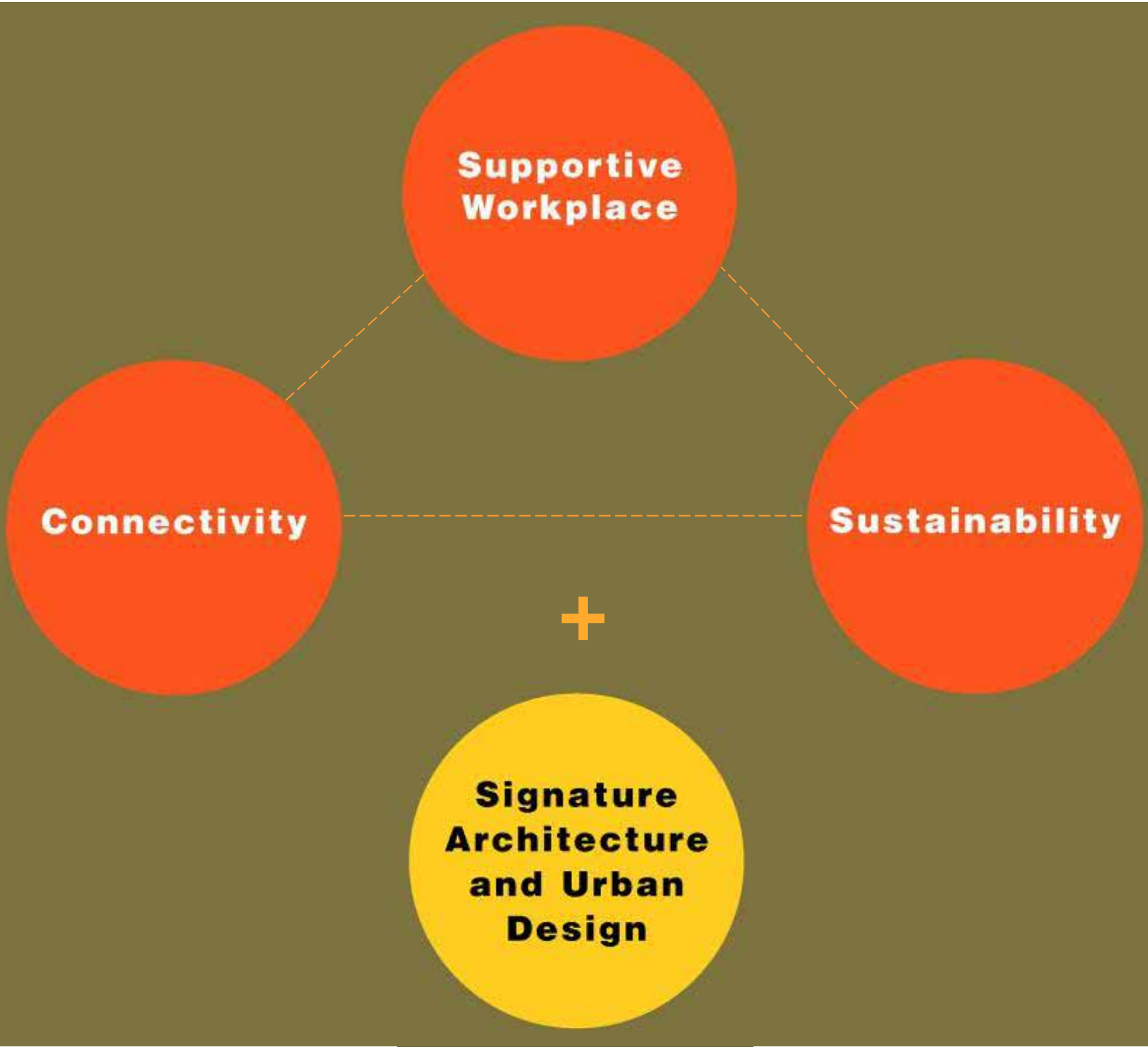
Downtown Consolidation

360 Portage Avenue

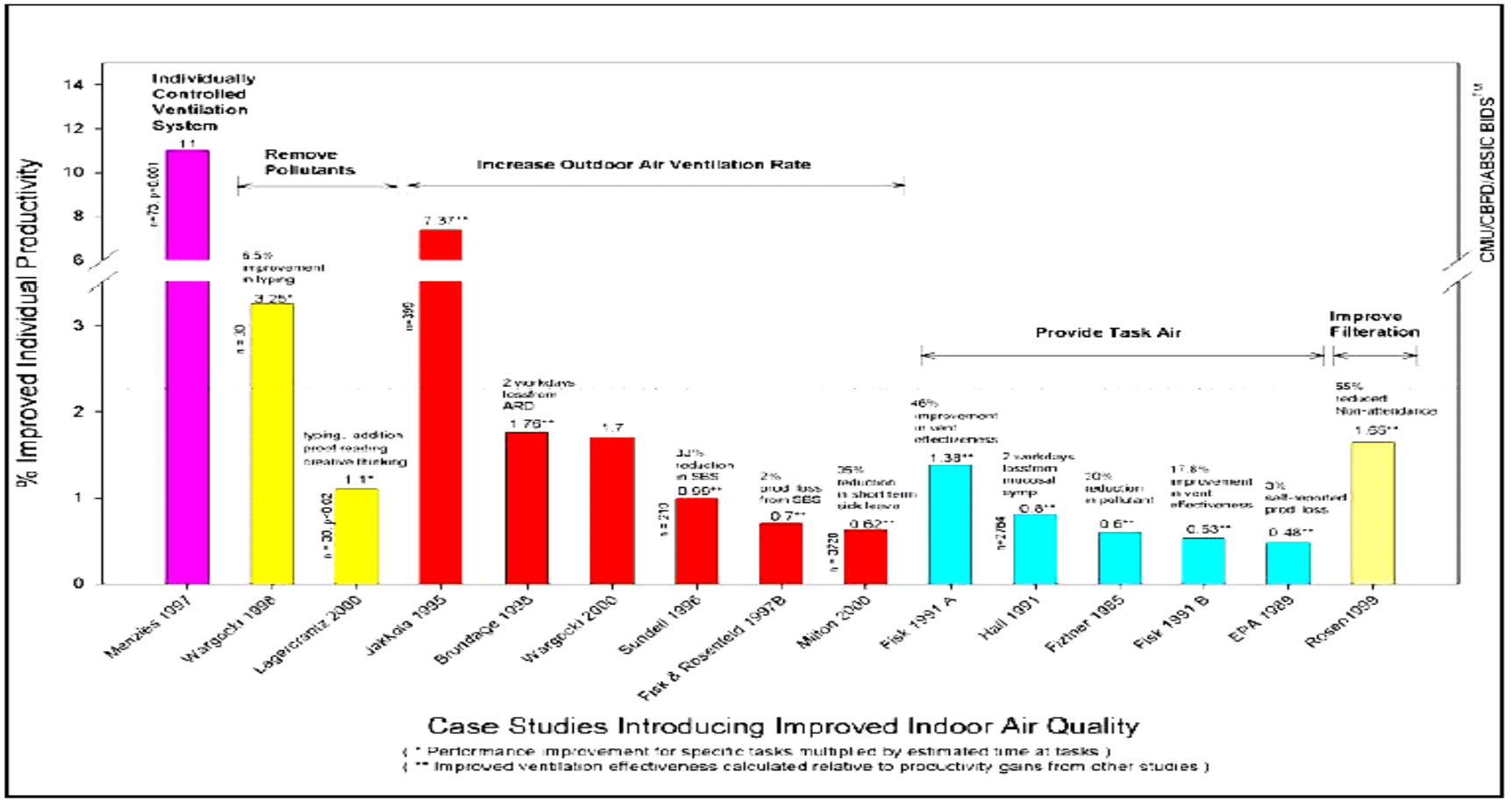
820 Taylor Avenue


Fixed
Design Team
Fixed
Design Team
Fixed Construction
Services Team
Conceptual
Work
Design
Work
Field
Services


Design Team
Experts
Experts
Concepts
Specialists
Specialists
Others
Design
Field
Services


Supportive Workplace
Connectivity
Sustainability
+
Signature Architecture and Urban Design

Supportive Workplace Productivity Drivers

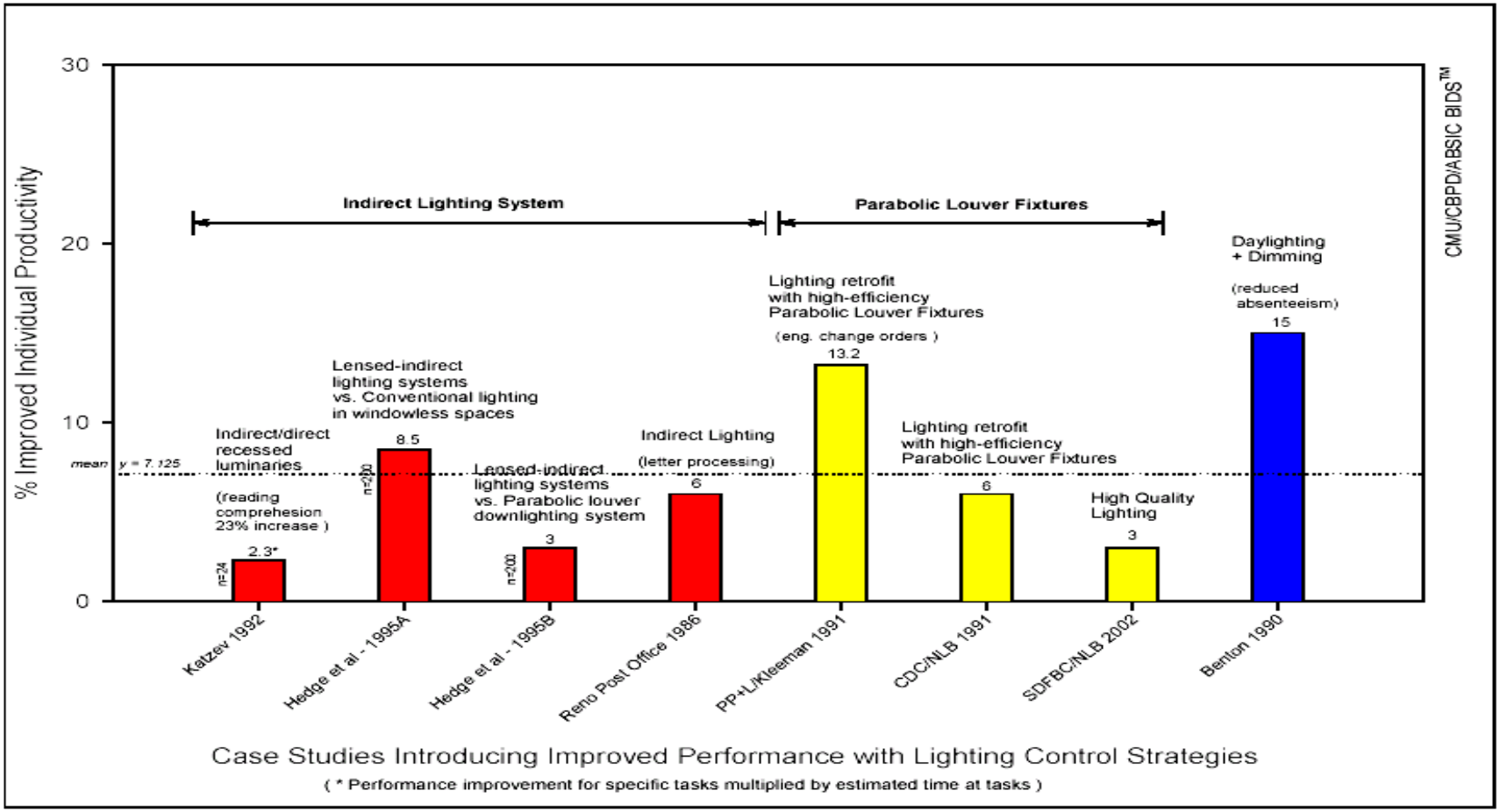


Source : The Costs and Benefits of Green Buildings – A Report to California's Sustainable Building Task Force, October, 2003

Supportive Workplace Productivity Drivers

- Individual Ventilation Control
- Air Quality

Supportive Workplace Productivity Drivers

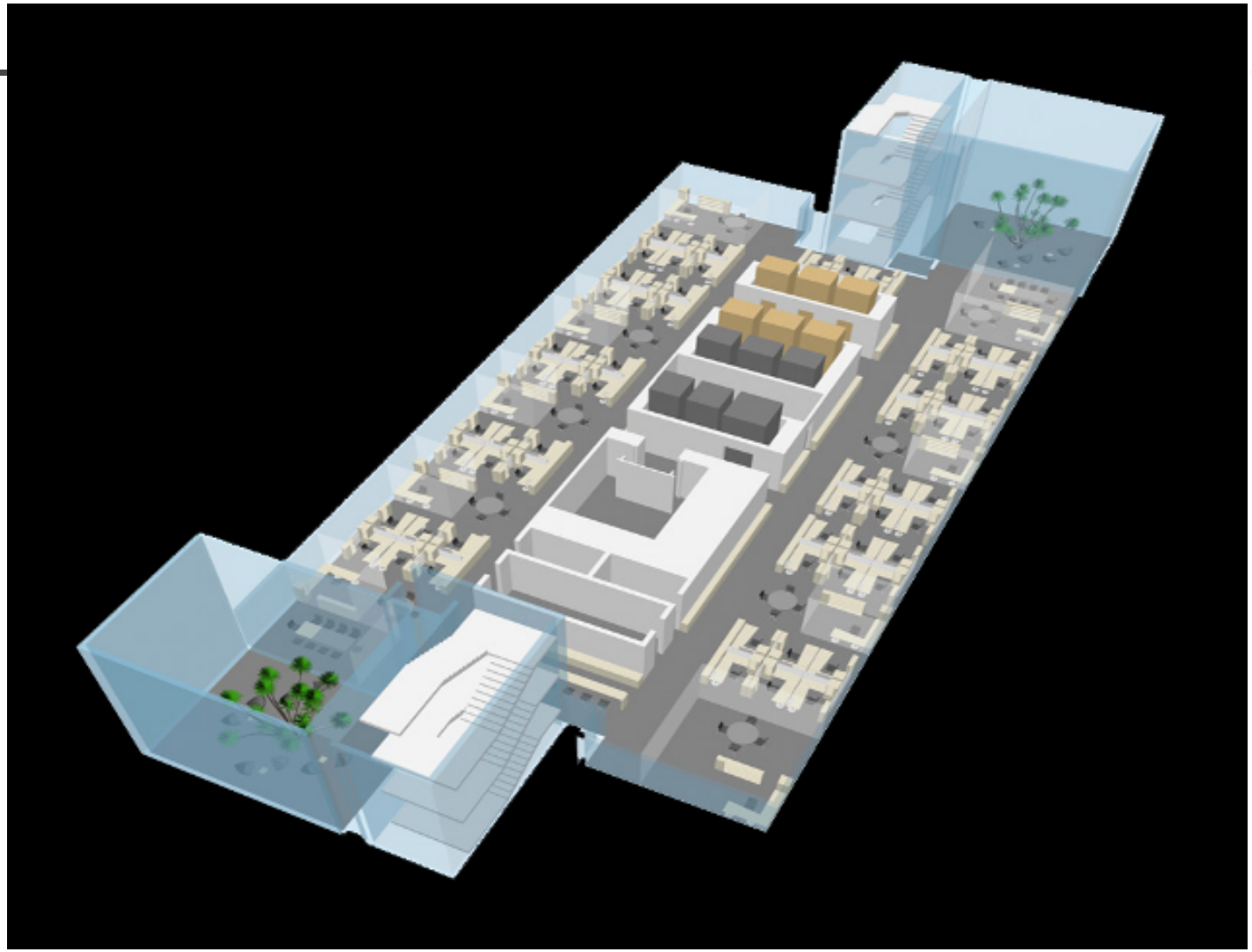


Source : The Costs and Benefits of Green Buildings – A Report to California's Sustainable Building Task Force, October, 2003

Supportive Workplace Productivity Drivers

- Daylight
- Indirect / High Quality Artificial Light

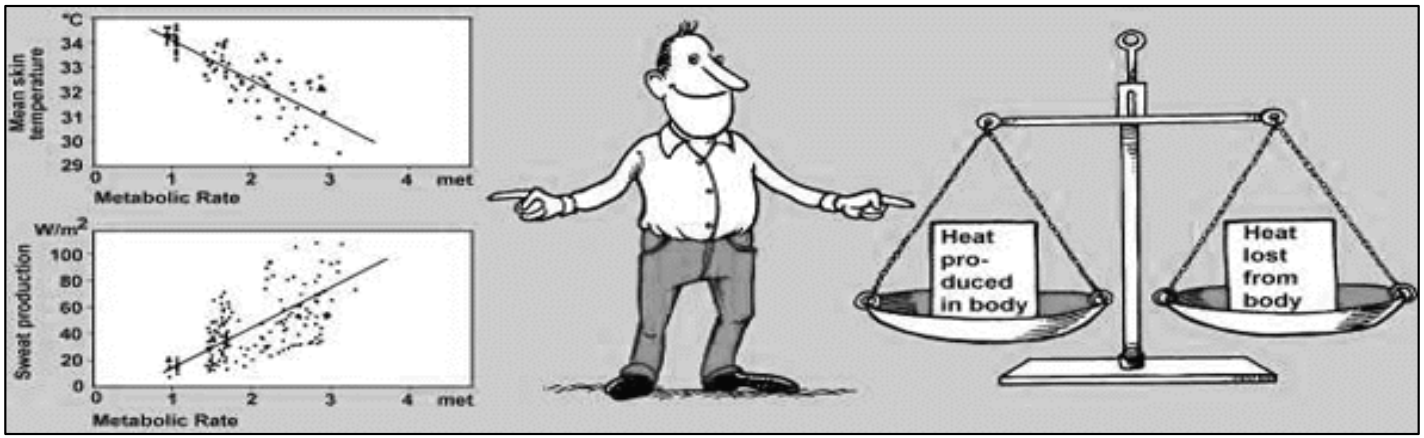
Supportive Workplace - Flexibility



Supportive Workplace Flexibility

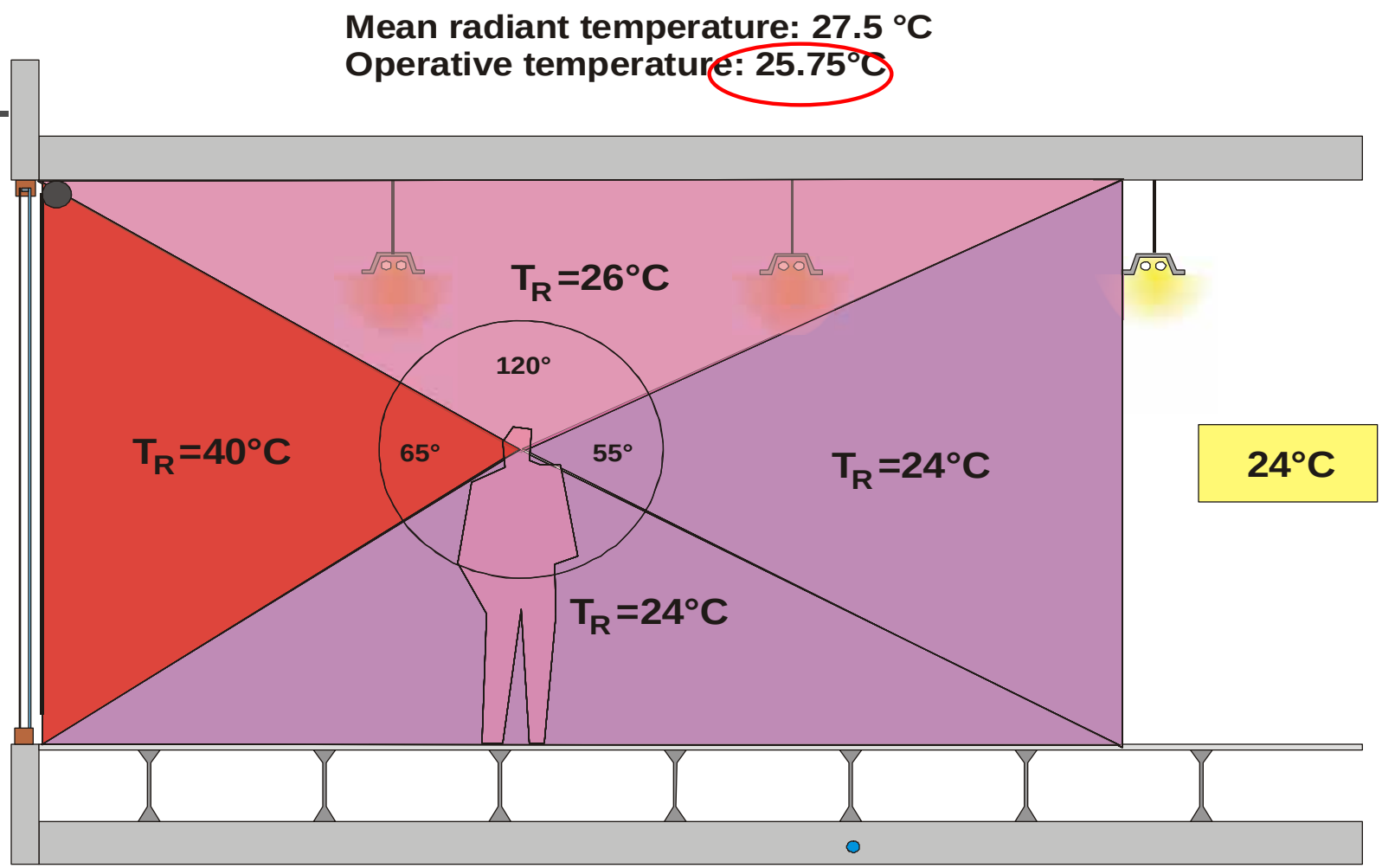
- Open vs. Closed Workspace
- Raised Floors
- Floor Plate Depth – Program vs. Daylight
- Common Space
- Vertical Circulation

Supportive Workplace
Thermal Comfort



Clothing
Activity – Metabolic Rate
Air Temperature and Movement
Mean Radiant Temperature
Outside Air Temperature

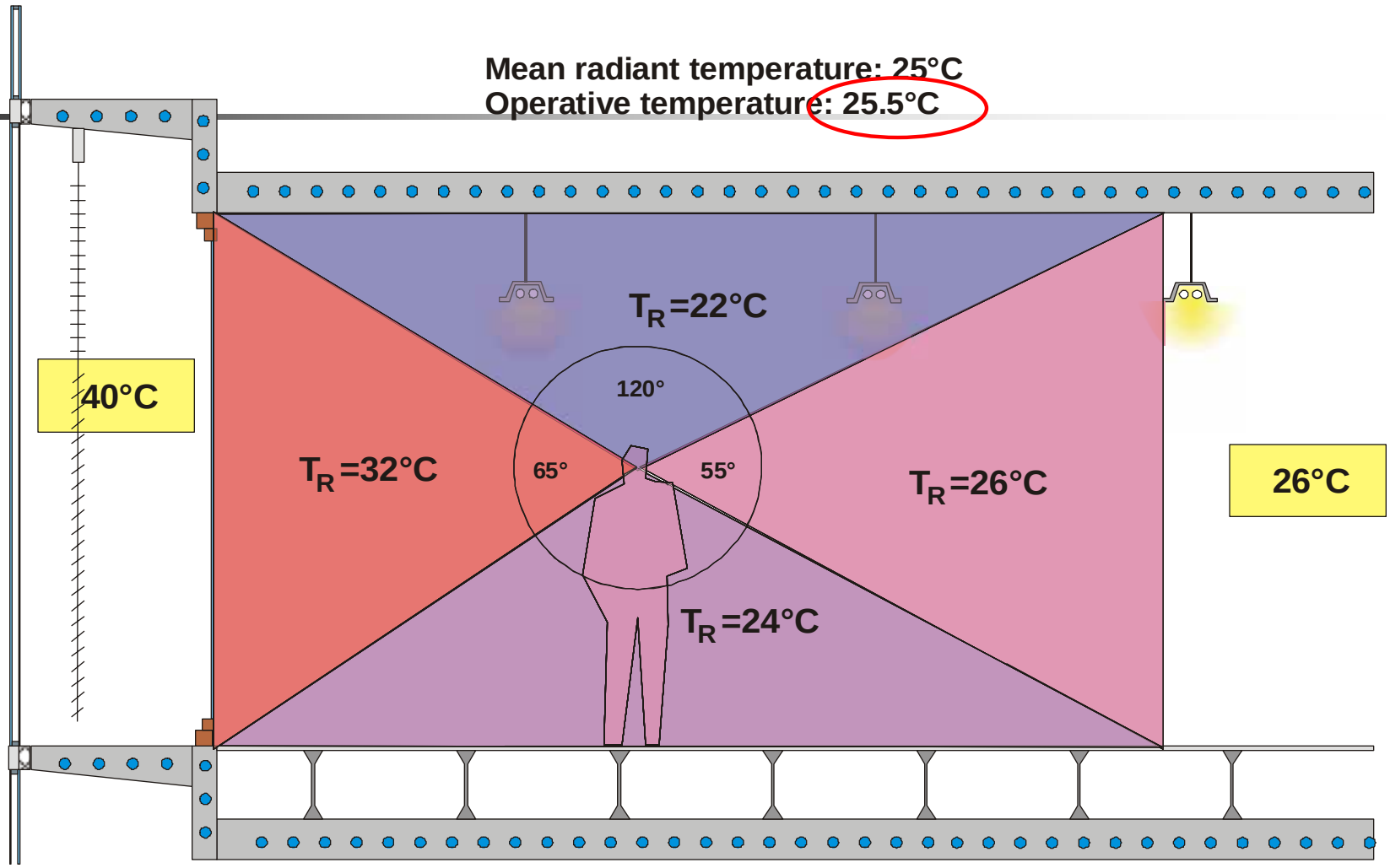
Supportive Workplace Thermal Comfort



"Standard" Office Building

Source : Transsolar Klimaengineering

Supportive Workplace Thermal Comfort



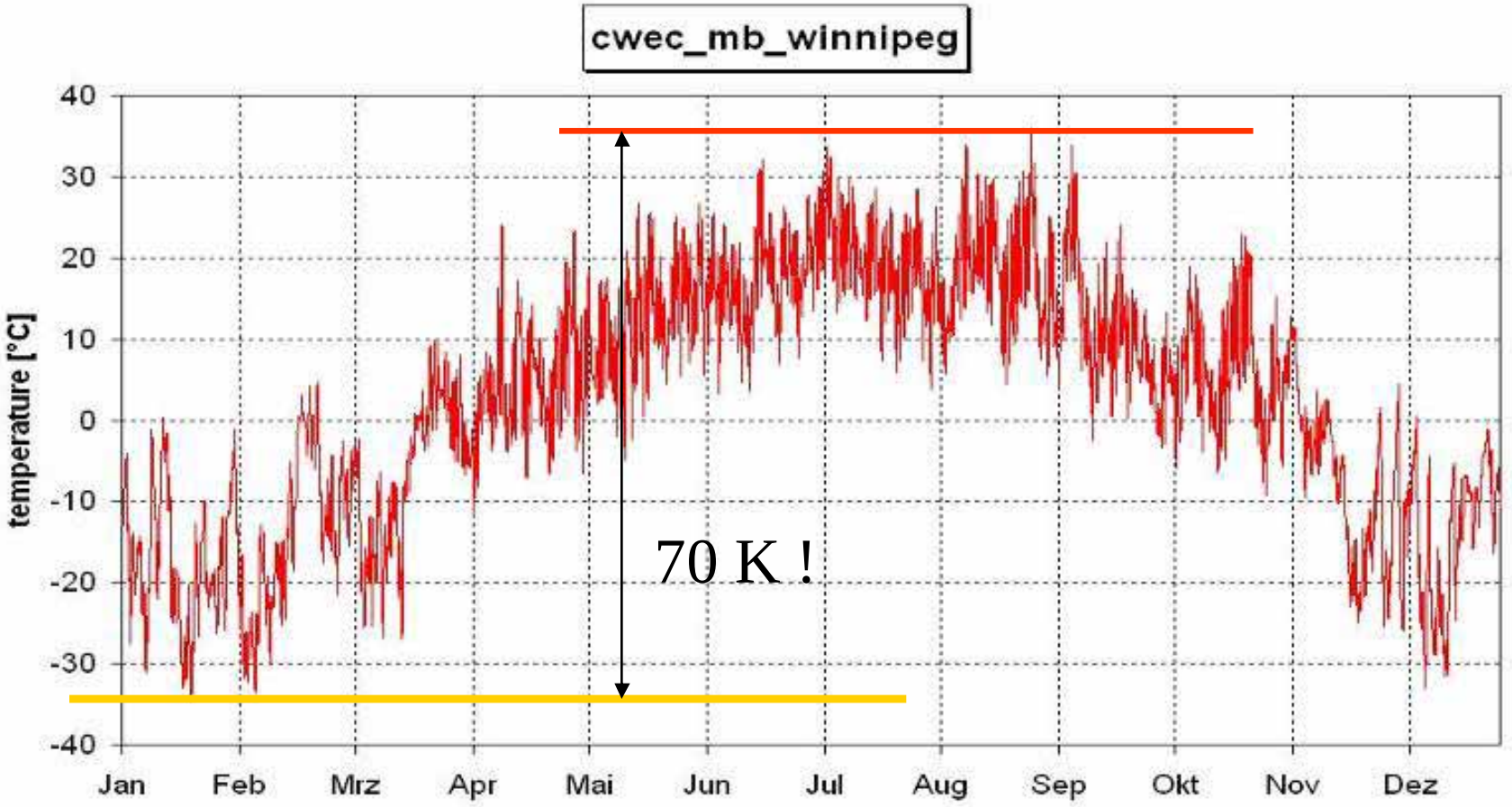
Manitoba Hydro Office Building

Source : Transsolar Klimaengineering

Climatic Responsive Design

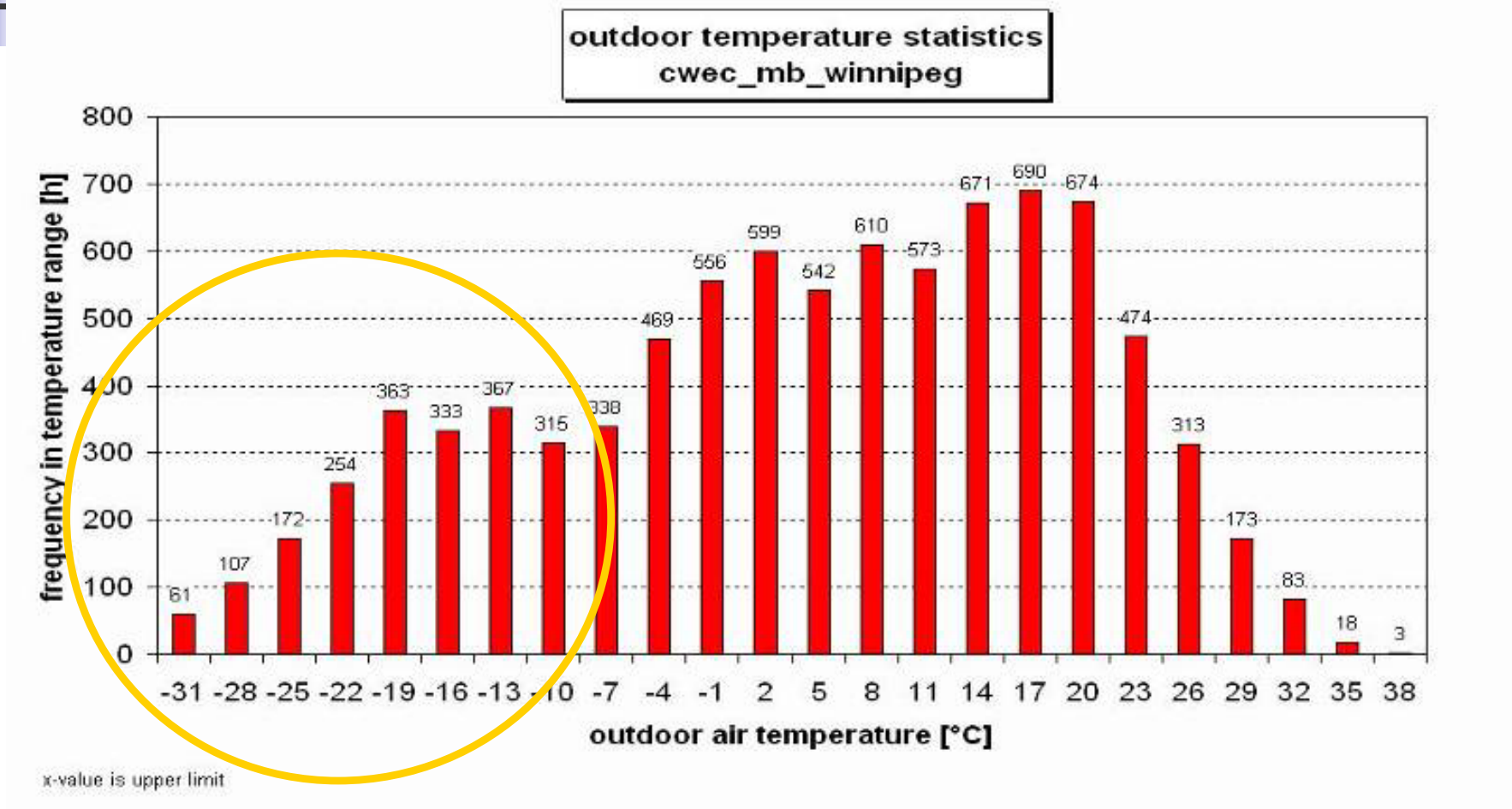
"Radiant Cooling & Natural Ventilation, eh?"

Climatic Responsive Design Weather Analysis



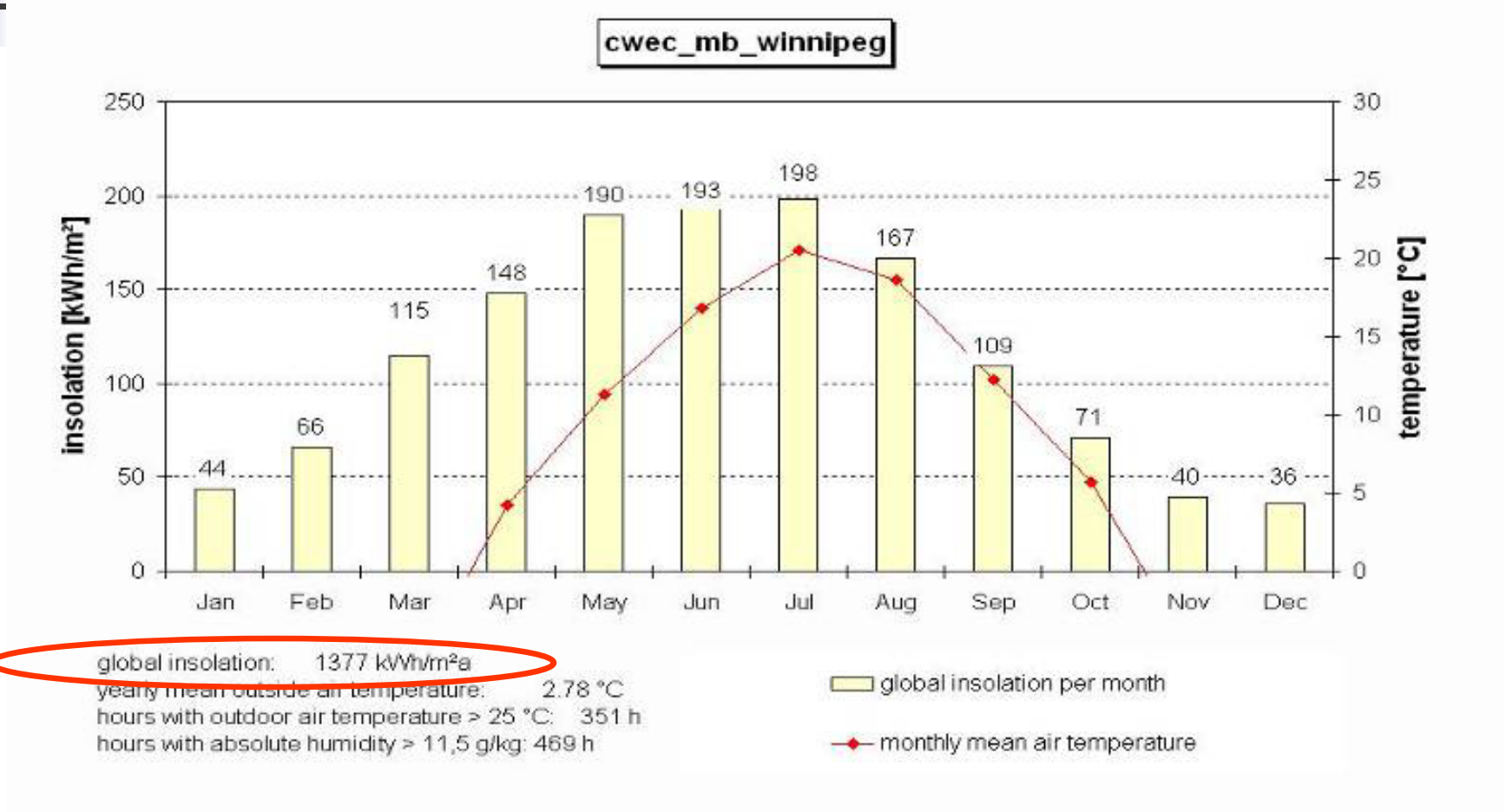
Source : Transsolar Klimaengineering

Climatic Responsive Design Weather Analysis



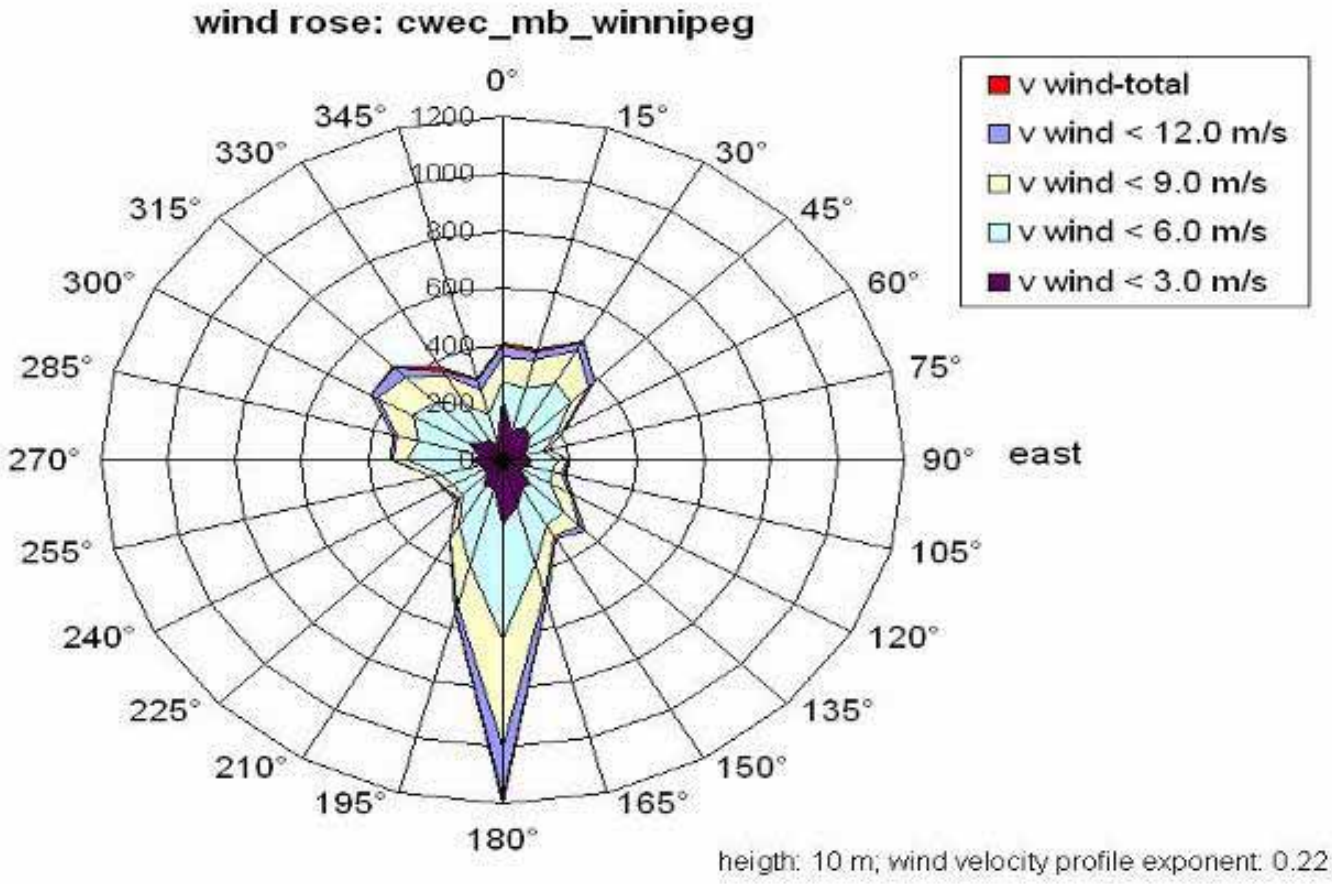
Source : Transsolar Klimaengineering

Climatic Responsive Design Weather Analysis



Source : Transsolar Klimaengineering

Climatic Responsive Design Weather Analysis



Source : Transsolar Klimaengineering

Climatic Responsive Design Weather Analysis

- Buffer Zones – Winter Gardens/Double Façade
- Natural Ventilation
- Vertical “Neighborhoods”
- “Narrow” Floor Plates For Access to Daylight
- High Floor to Floor To Enhance Natural Lighting
- High Performance Envelope
- Raised Floors

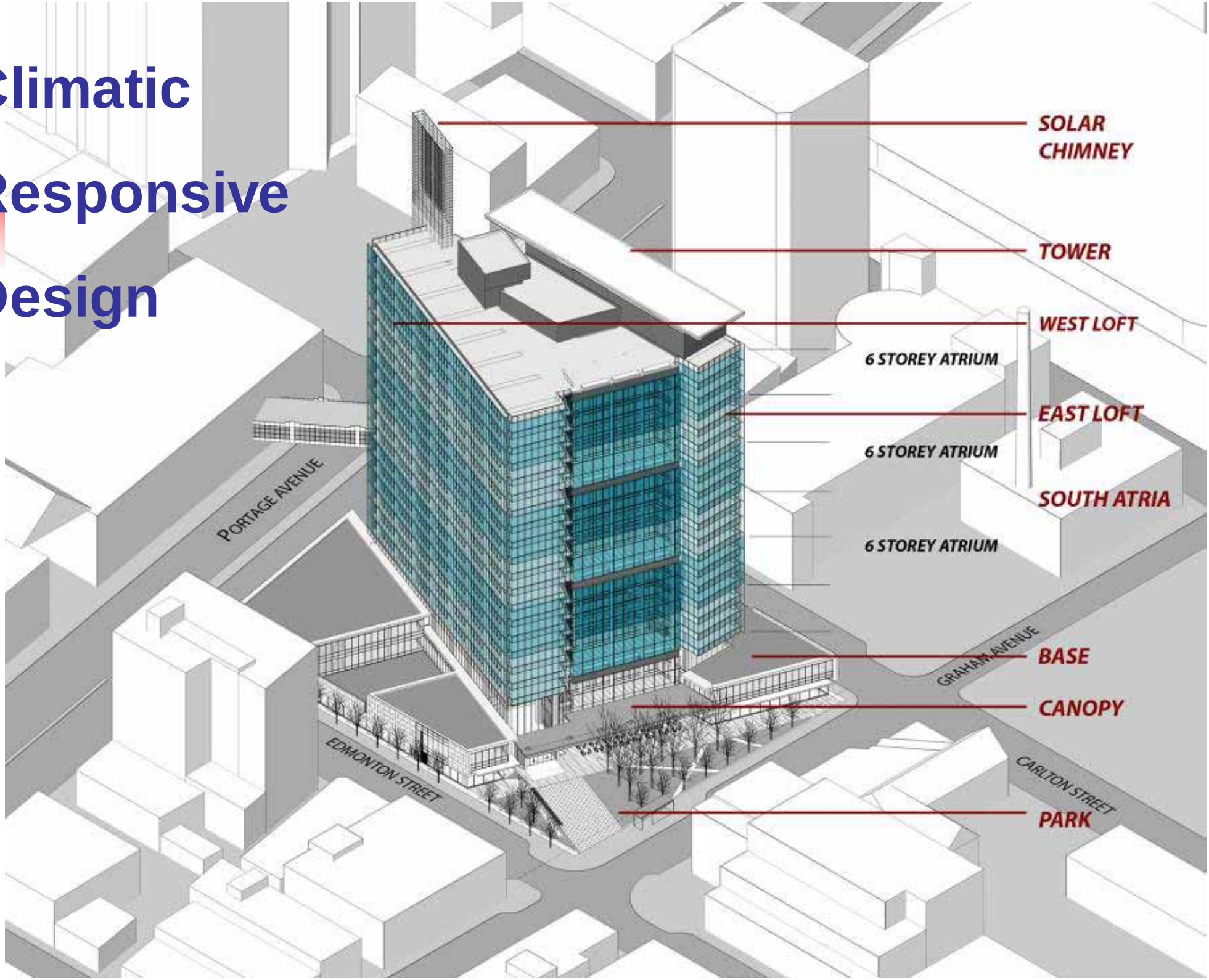
Passive versus Active HVAC systems

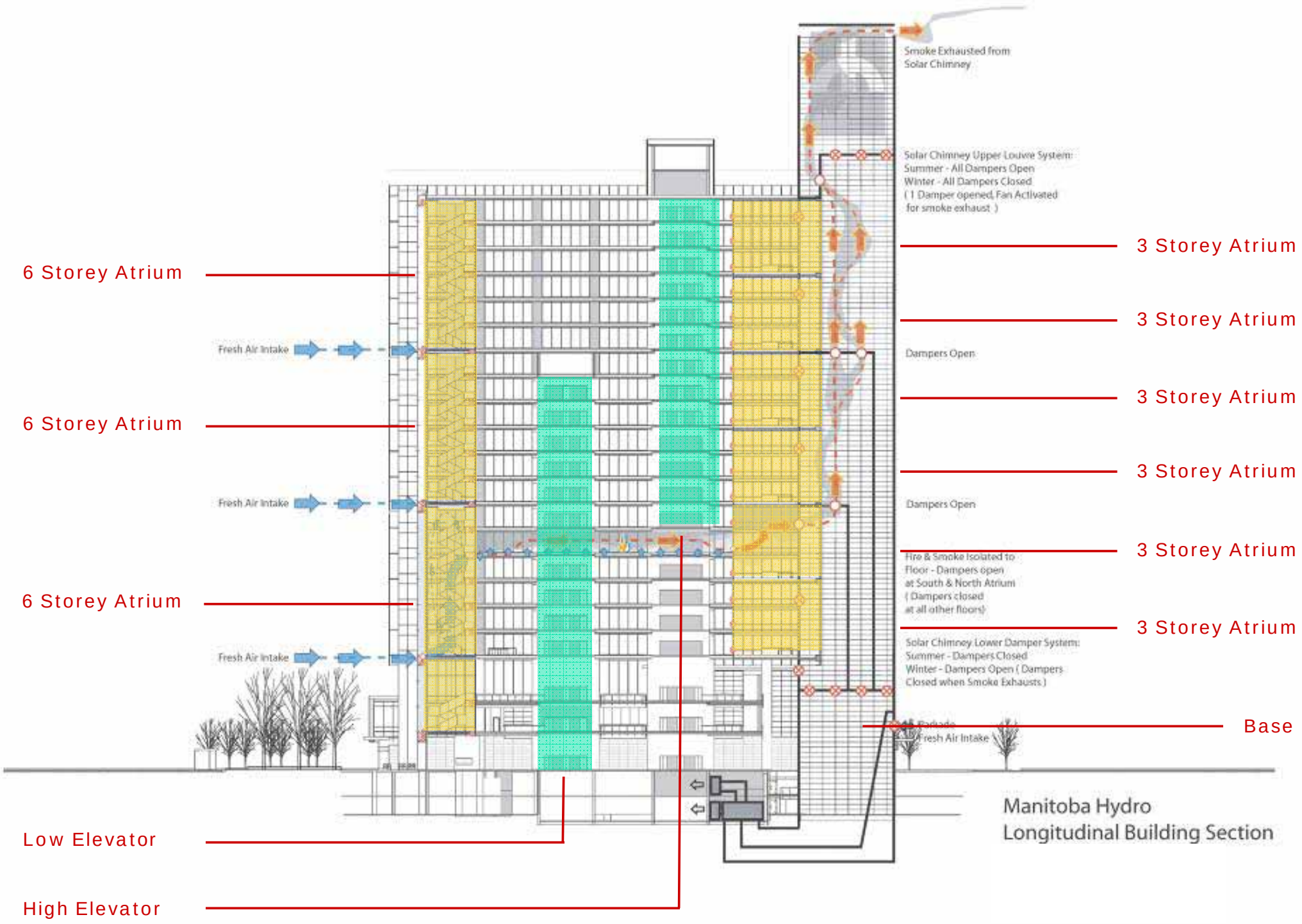
Climatic Responsive Design
Buffer Zones

Atria

Double Facade

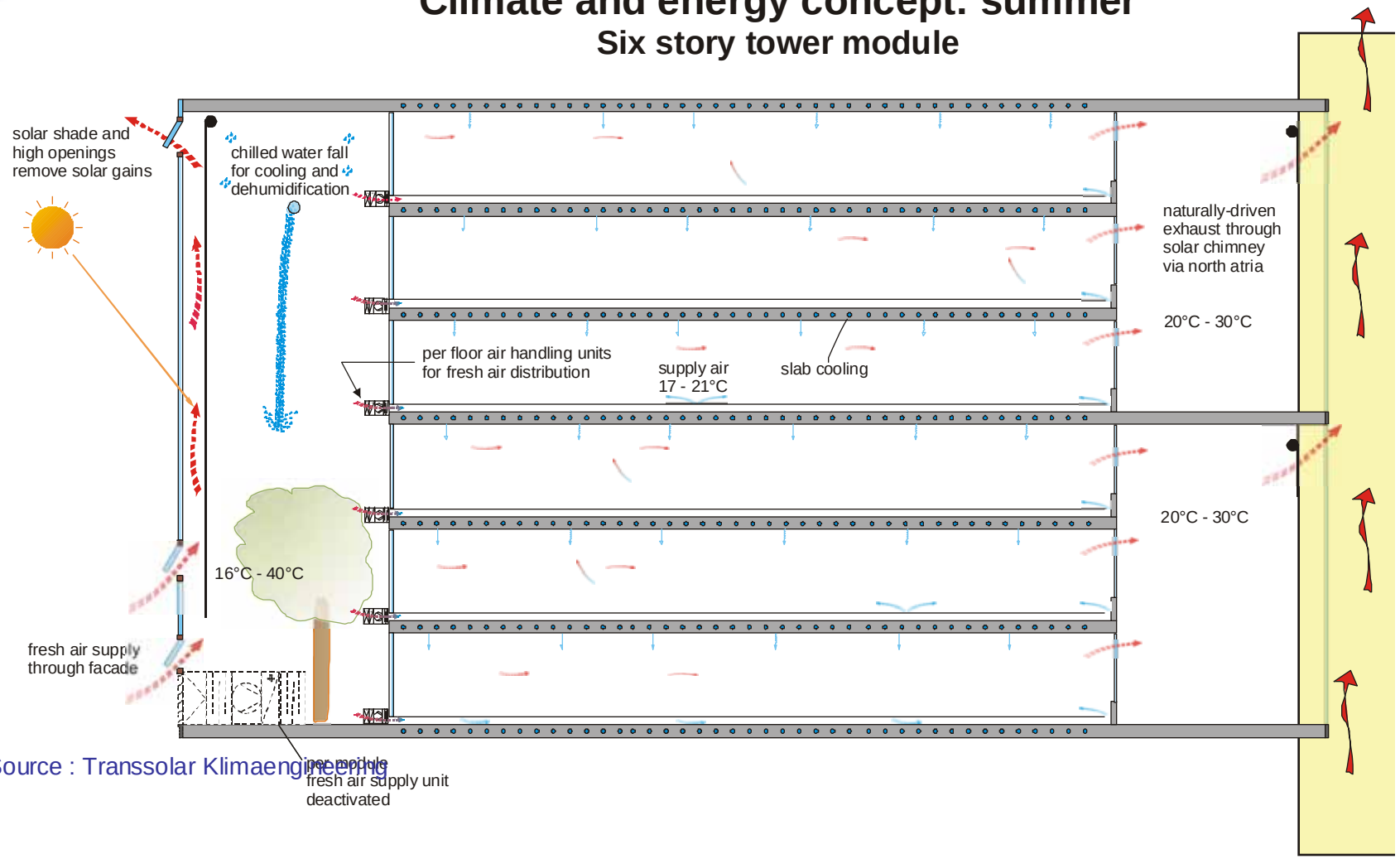
Climatic Responsive Design




Smoke Exhausted from Solar Chimney
Solar Chimney Upper Louvre System:
Summer - All Dampers Open
Winter - All Dampers Closed
(1 Damper opened, Fan Activated for smoke exhaust)
3 Storey Atrium
6 Storey Atrium
3 Storey Atrium
Fresh Air Intake
Dampers Open
6 Storey Atrium
3 Storey Atrium
3 Storey Atrium
Fresh Air Intake
Dampers Open
3 Storey Atrium
Fire & Smoke Isolated to Floor - Dampers open at South & North Atrium (Dampers closed at all other floors)
6 Storey Atrium
3 Storey Atrium
Solar Chimney Lower Damper System:
Summer - Dampers Closed
Winter - Dampers Open (Dampers Closed when Smoke Exhausts)
Fresh Air Intake
Base
Low Elevator
High Elevator
Manitoba Hydro
Longitudinal Building Section

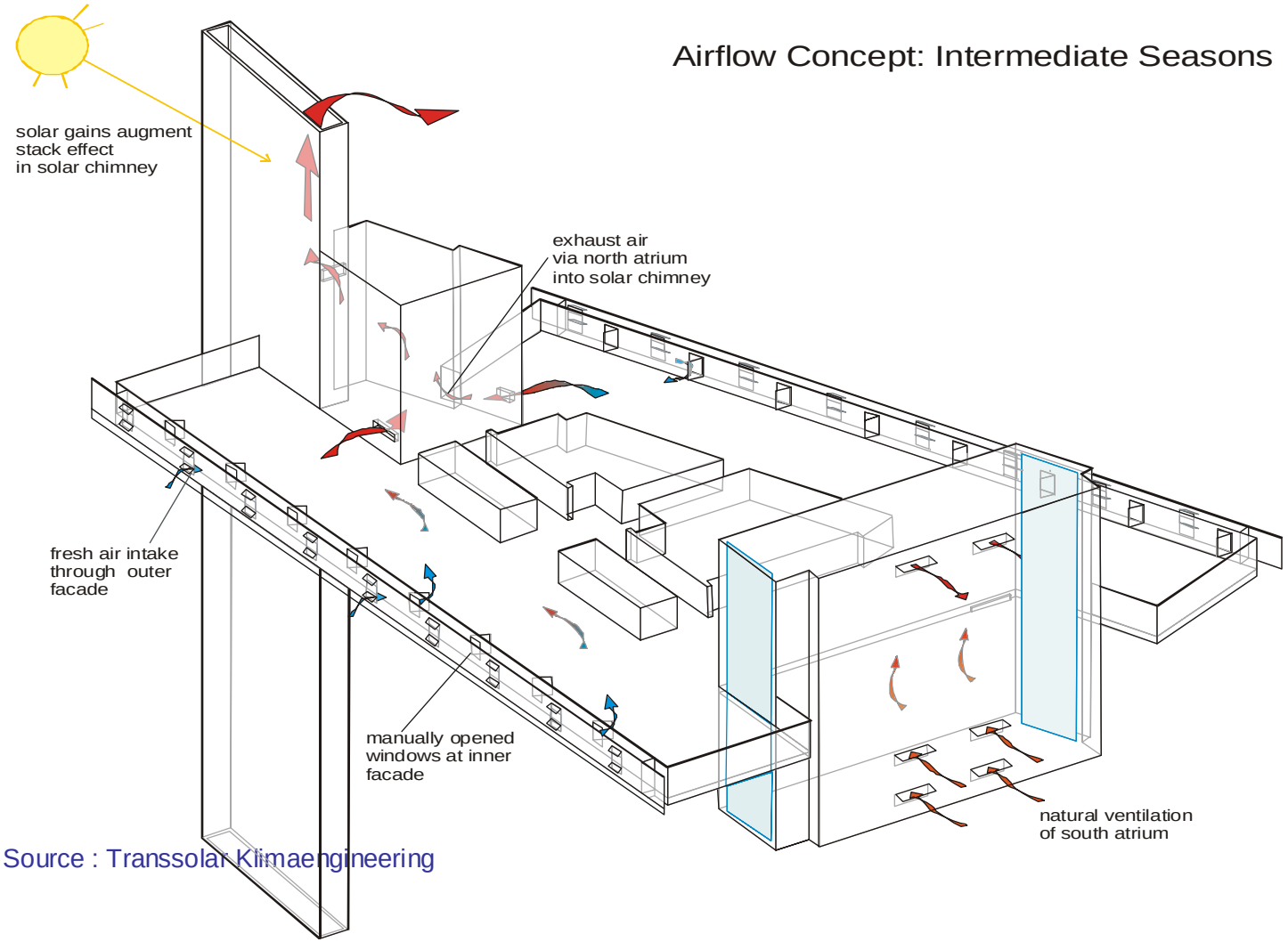
Climatic Responsive Design
Energy Efficiency

Climate and energy concept: summer
Six story tower module



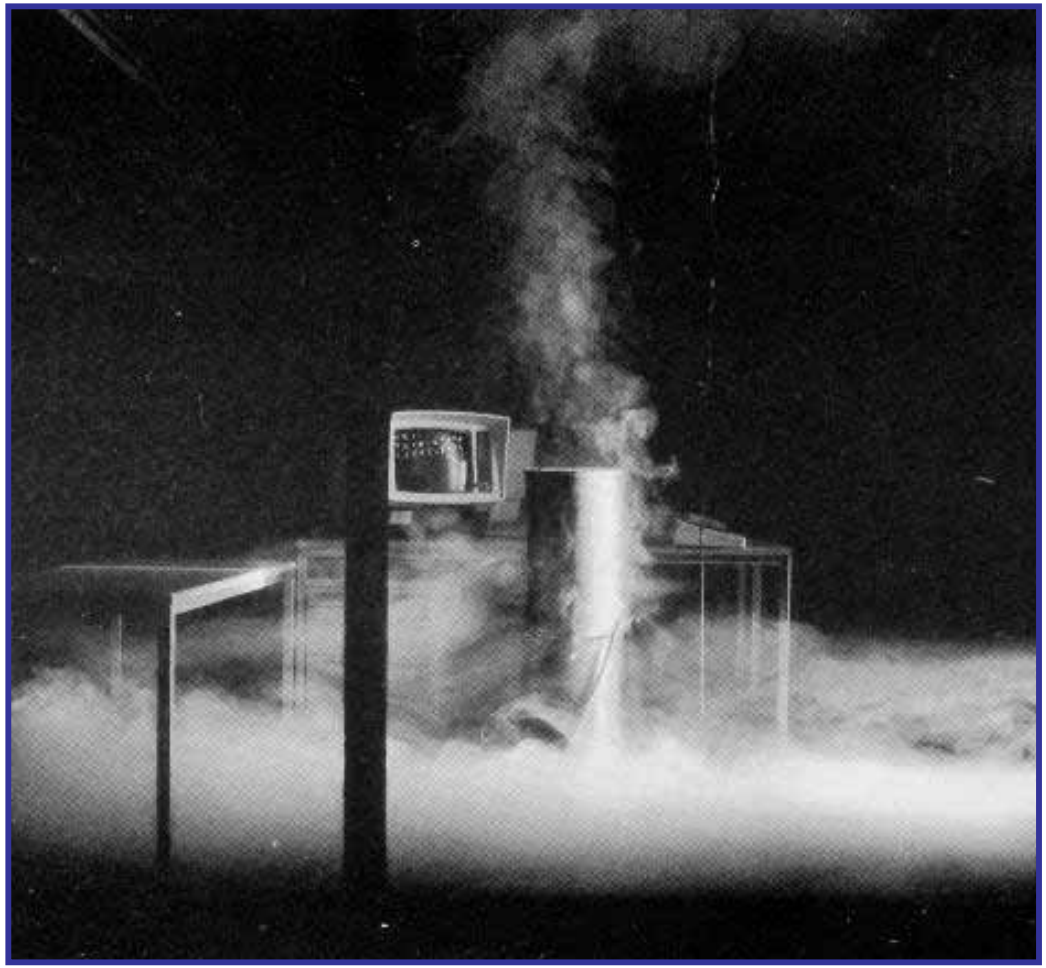
Source : Transsolar Klimaengineering

Climatic Responsive Design
Energy Efficiency



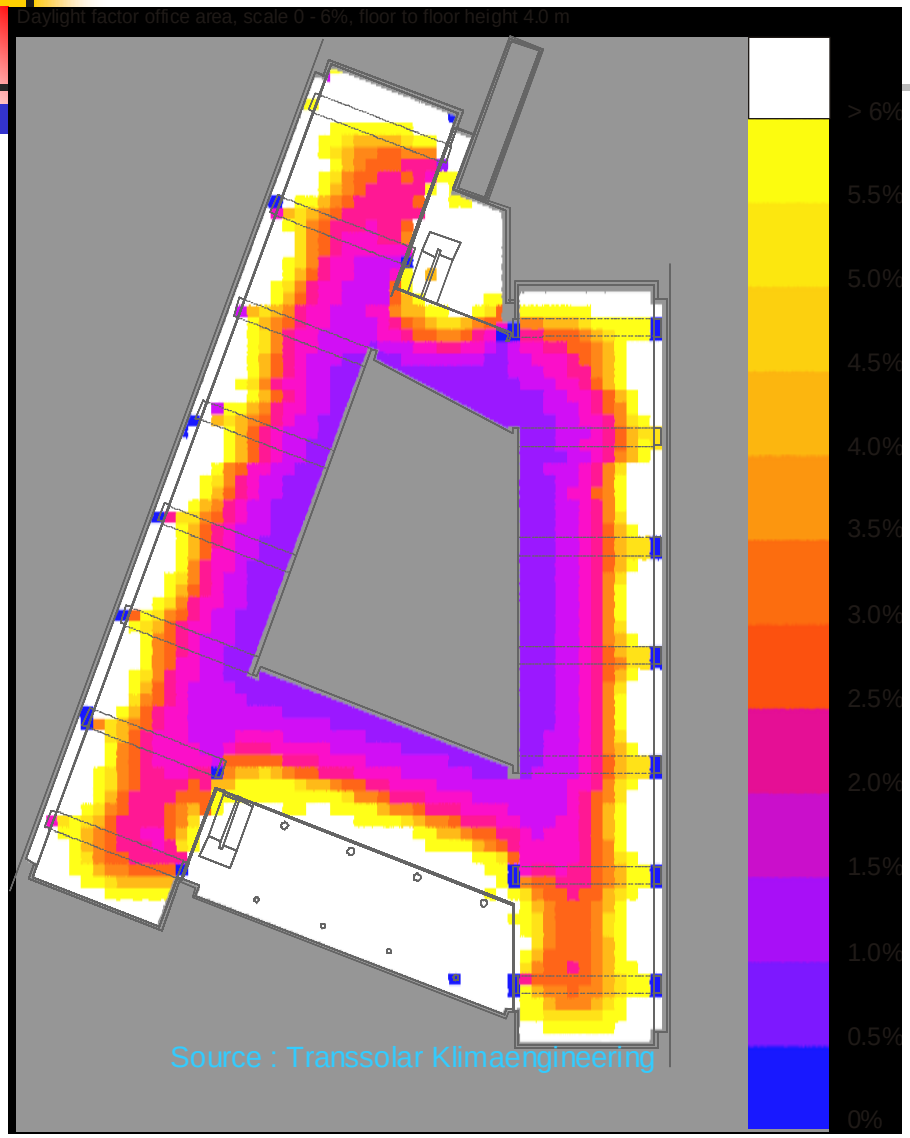
Source : Transsolar Klimaengineering

Climatic Responsive Design
Displacement Ventilation



Displacement
Ventilation
Air Pattern

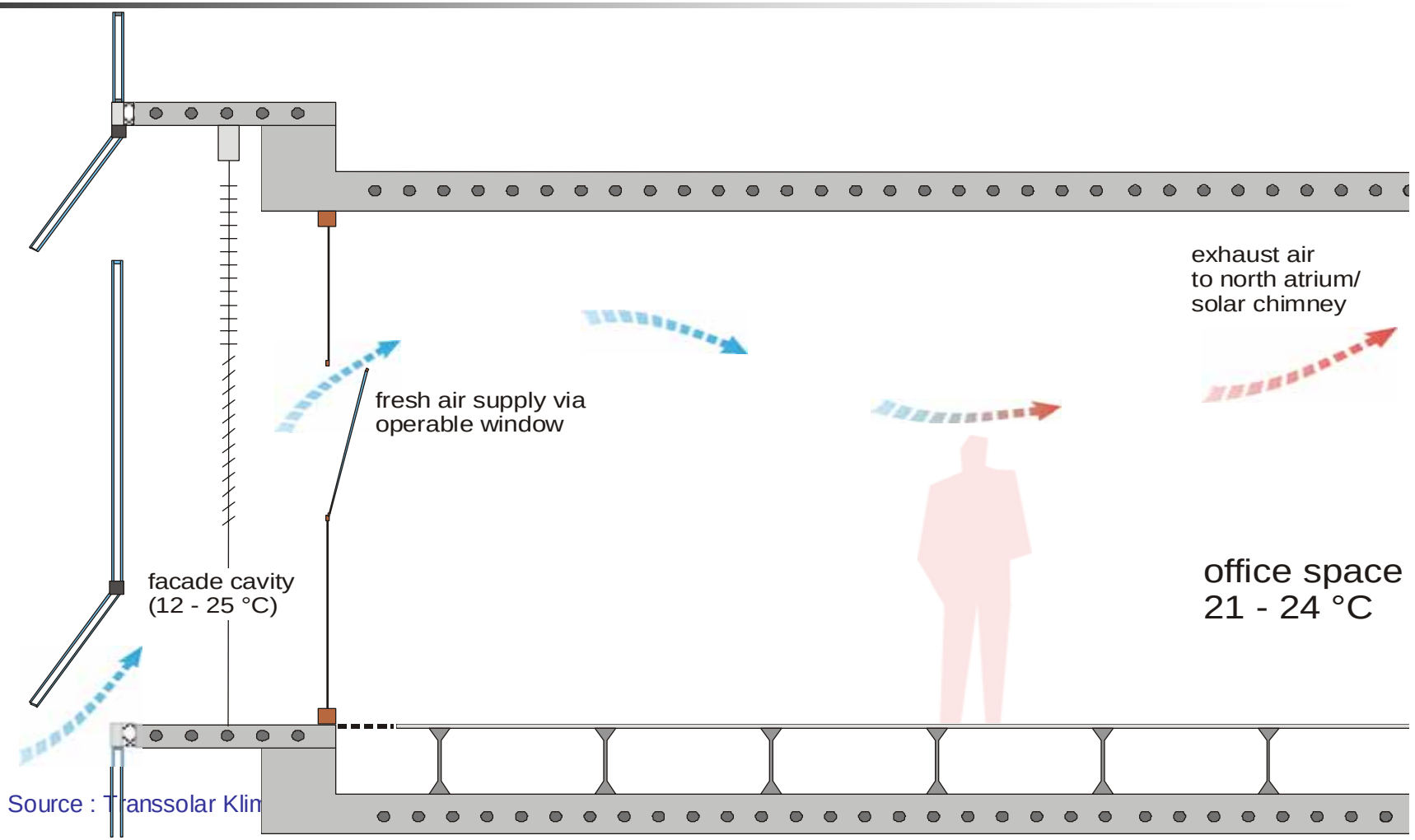
Climatic Responsive Design



Daylight Factor

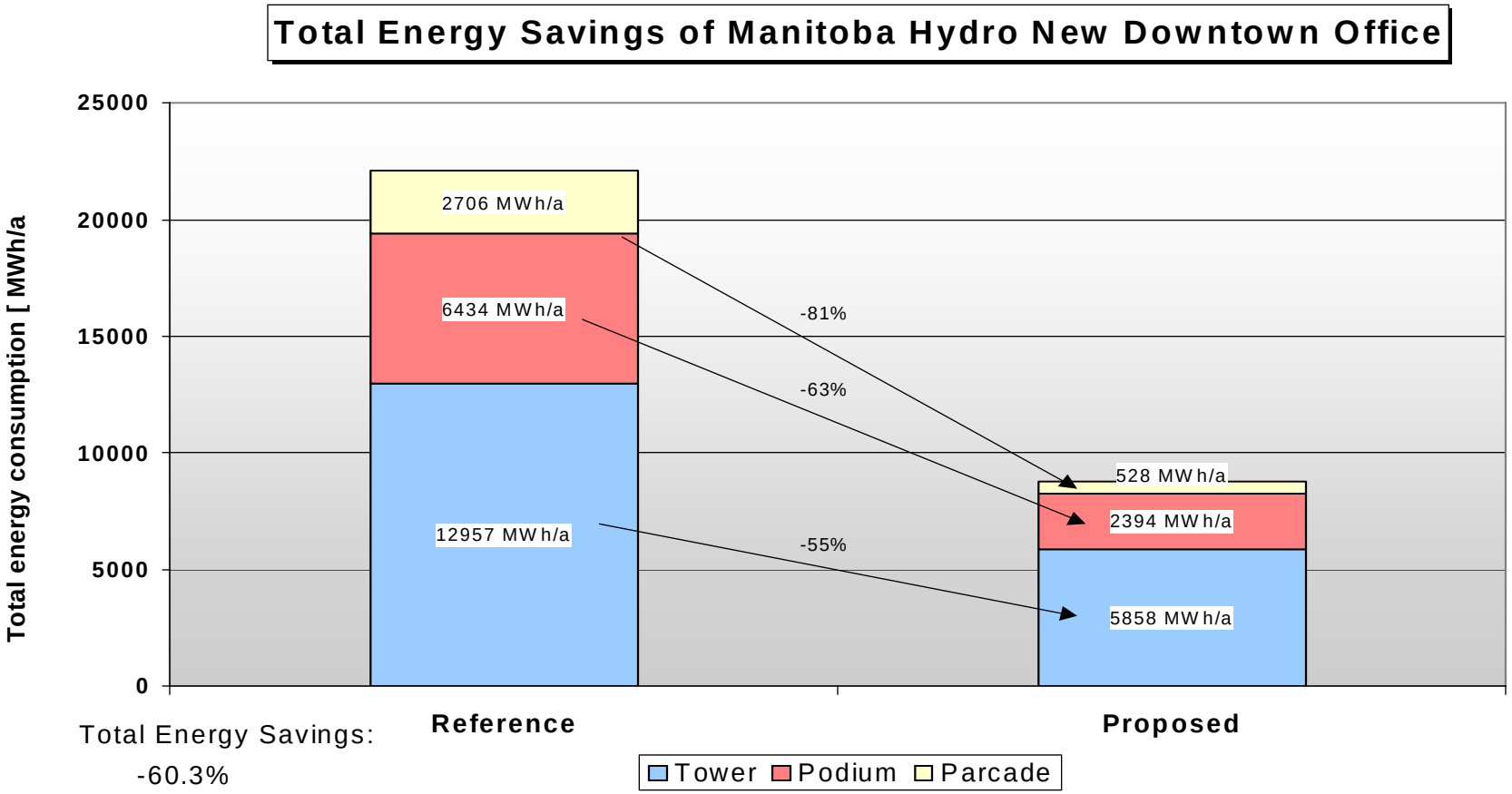
- Floor to Floor = 4.0m
- Outside Insolation = 10,000 Lux
- 1% = 100 Lux

Climatic Responsive Design Energy Efficiency



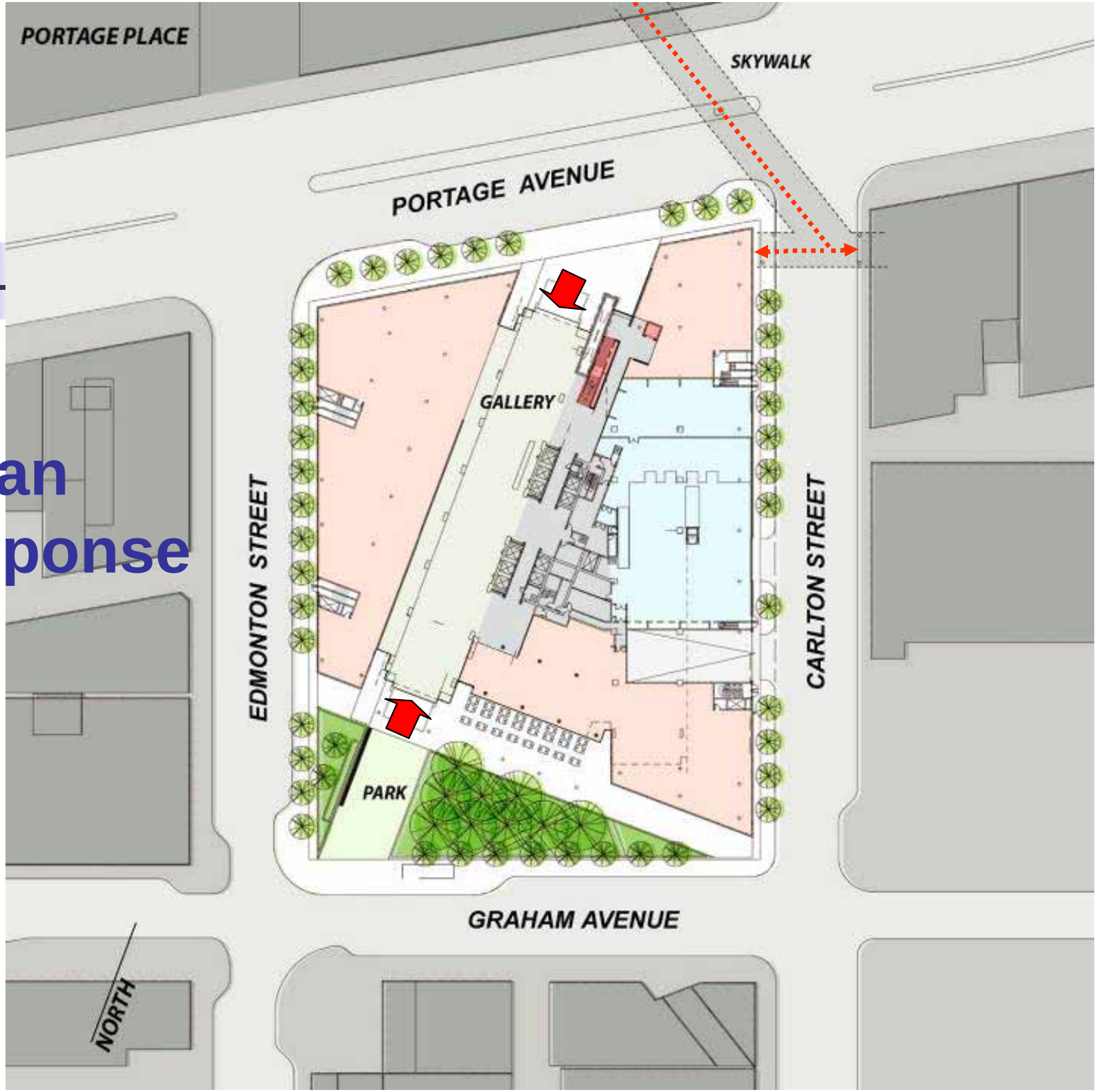
Source : Transsolar Klim

Climatic Responsive Design
Energy Efficiency
Predicted Energy Savings > 60%



Source : Transsolar Klimaengineering

Urban Response




360


RT3-ST


R-520
SOILMEC
Place Louis Riel


Winnipeg Free Press
INGERSOLL-RAND

Bid Packages

- BP#1 (awarded in Feb./March of 2005)
  - Removal of Hazardous Materials (RCW Envir. Ltd.)
  - Demolition & Deconstruction (Paragon Industries)
- BP#2 (awarded in July 2005)
  - Foundations (Subterranean (Manitoba) Ltd.)
- BP#3 (Awarded October 7, 2005)
  - Elevator – ThyssenKrupp Elevator
- BP#4 (Schedule award in Dec. 2005)
  - Curtainwall – Pre-Qual. Closed on Sept. 22, 2005

Bid Packages

- BP#5
  - Geothermal Wells – **Awarded October 7, 2005** – Friesen Drillers
  - Subsurface M & E – Schedule award in Nov. 2005
  - Major M & E Equip– Schedule award in Dec, 2005
  - Base Build'g M & E – Schedule award in Mar, 2006
- BP#6
  - Concrete Structure – Schedule award in Jan. 2006
  - Structural Steel – Schedule award in Feb. 2006

Bid Packages

- BP#7 (Schedule award in July, 2006)
  - Architectural Base Bid
- BP#8 (Schedule award in August, 2006)
  - Sitework
- BP#9 (Schedule award in October, 2006)
  - Architectural Interiors
- BP#10 (Schedule award February, 2007)
  - Office Interiors

Thank you

Are there any questions?