



BSEEP's Passive Design Guideline

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Tropicalized Guideline to Malaysian Climate

1. Fundamentals
2. Climate Analysis
3. Building Form & Orientation
4. Daylight Harvesting
5. Glazing Properties
6. External & Internal Shades
7. Wall Insulation
8. Roof Insulation
9. Atrium Ventilation
10. Zoning
11. Infiltration



Issues yet to be
addressed...



Roof Insulations

Low-E foil on Roof

- ▶ Very low U-value computation.
 - ▶ Static based computation.
- ▶ How effective is it vs. thick insulation in our climate?

How to model
this correctly?

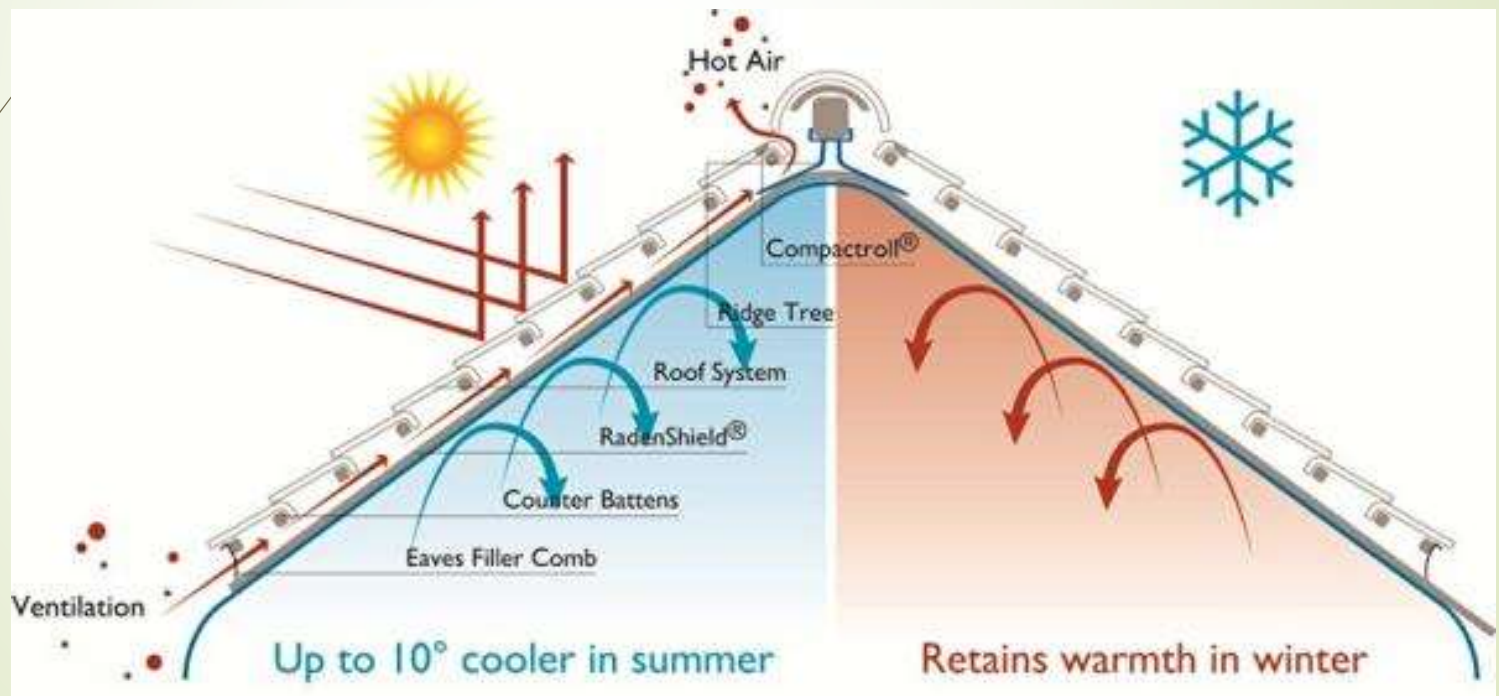
Infiltration
rate?

Need to verify
the model is
correct....



Cool Roof?

➤ Monier

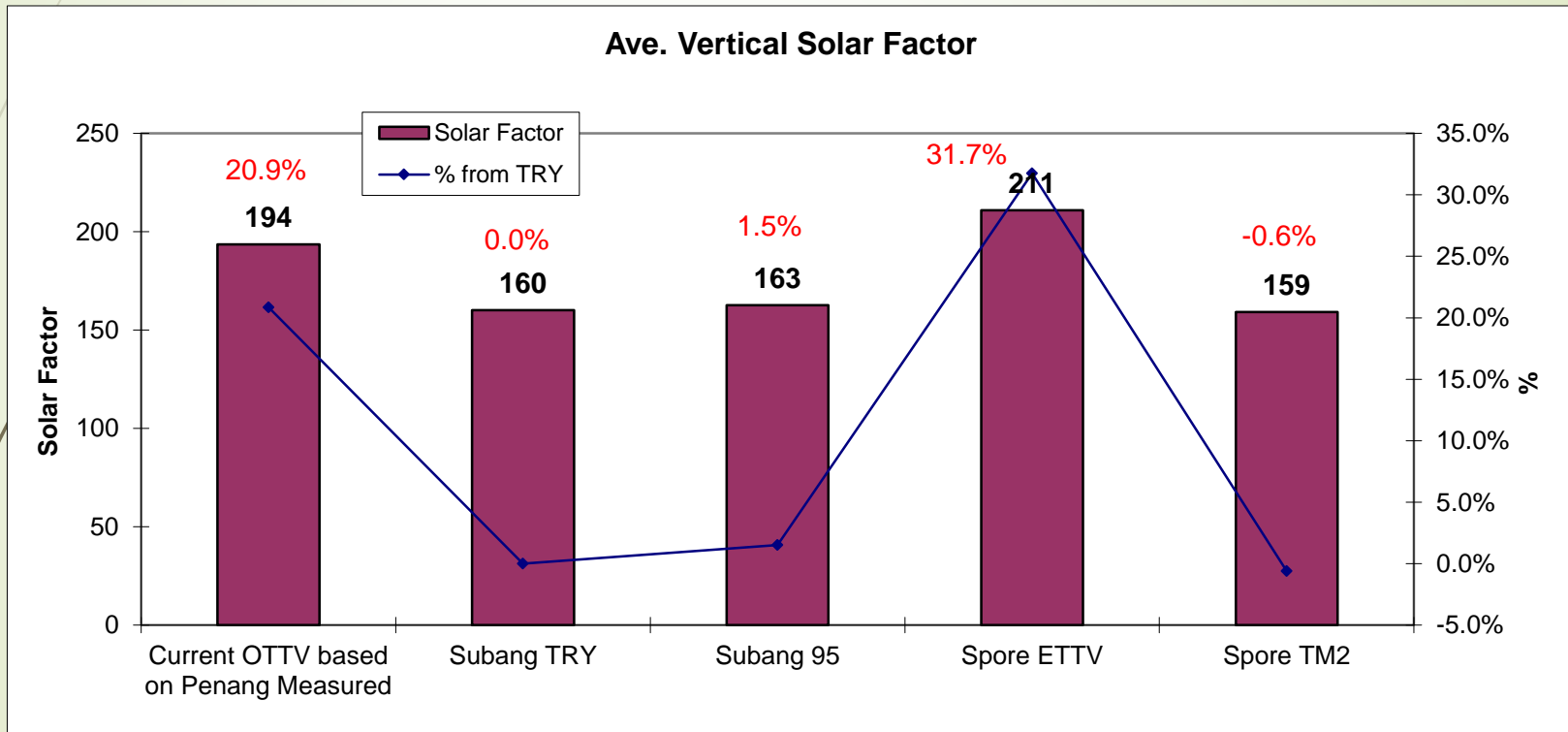




Overall Thermal Transmission Value (OTTV)

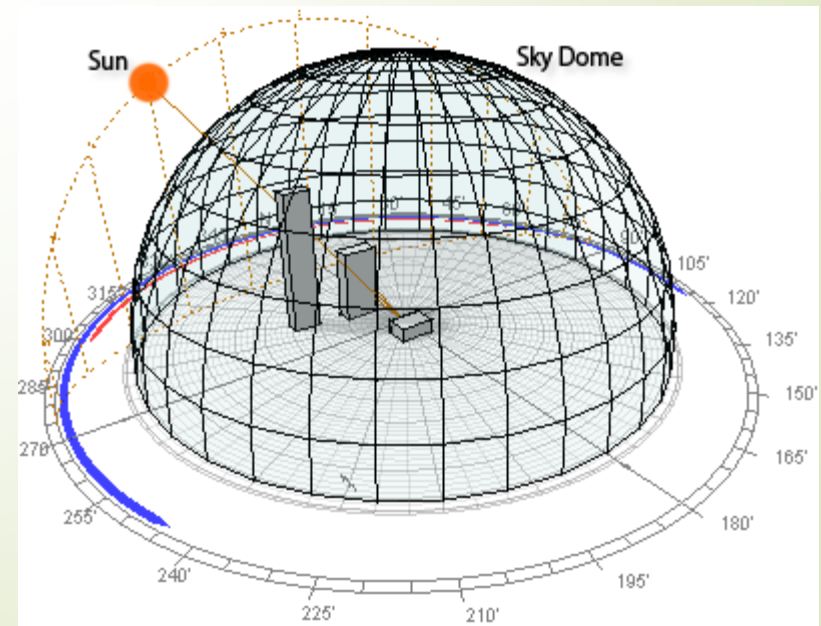
$$\text{OTTV}_i = 15 \alpha (1 - \text{WWR}) U_w + 6 (\text{WWR}) U_f + (194 \times \text{CF} \times \text{WWR} \times \text{SC})$$

Average Vertical Solar Factor



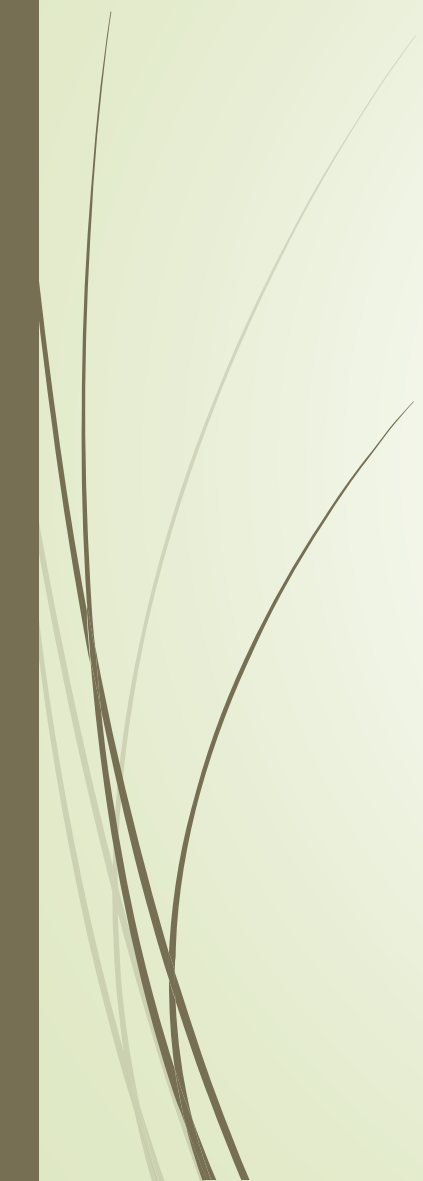
OTTV External Shading Coefficient

- Current shading coefficient only addressed direct shading. It ignored diffuse shading.
- Need to re-compute all the shading coefficient incorporating diffuse shading.





May need to develop easier guideline on OTTV

- ▶ Provide a table for different Windows-to-Wall ratio for each
- 



Daylight Harvesting



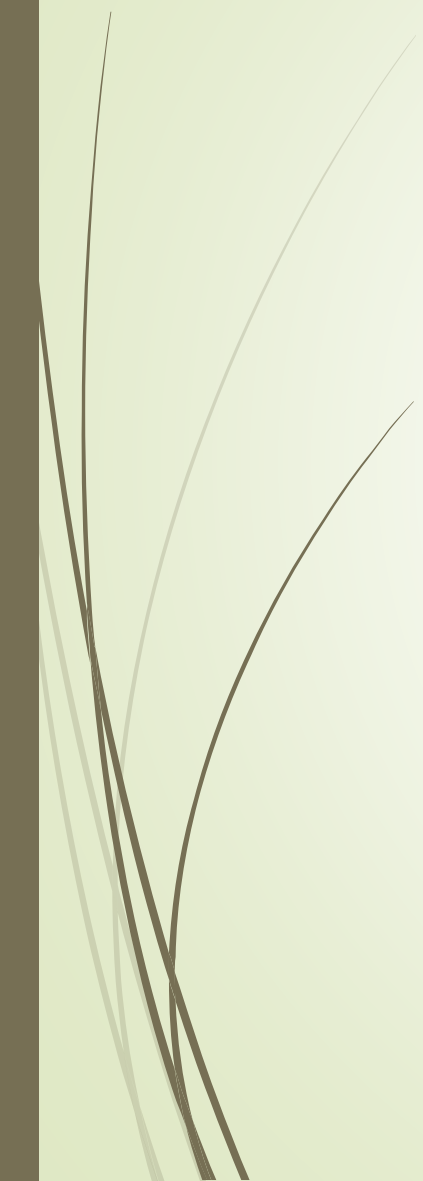


How far can we push the boundary?

- Glare
 - Acceptable Luminance Intensity for various lighting level.
- Uniformity
 - Acceptable daylight uniformity
- Lux
 - Minimum acceptable lux level or daylight factor.



Roof Daylight Harvesting

- More Solutions should be provided.
 - Skylight
 - Light scope
 - Jack Roof
- 



Wall Insulation

Thermal Mass not Addressed!

- ▶ Traditional Malay Kampung House
 - ▶ Very low thermal mass
- ▶ Traditional Chinese Shoplots & Colonial Buildings
 - ▶ High thermal mass
- ▶ Different for Air-Conditioned Building vs. Naturally Ventilated Building?
 - ▶ How about both?

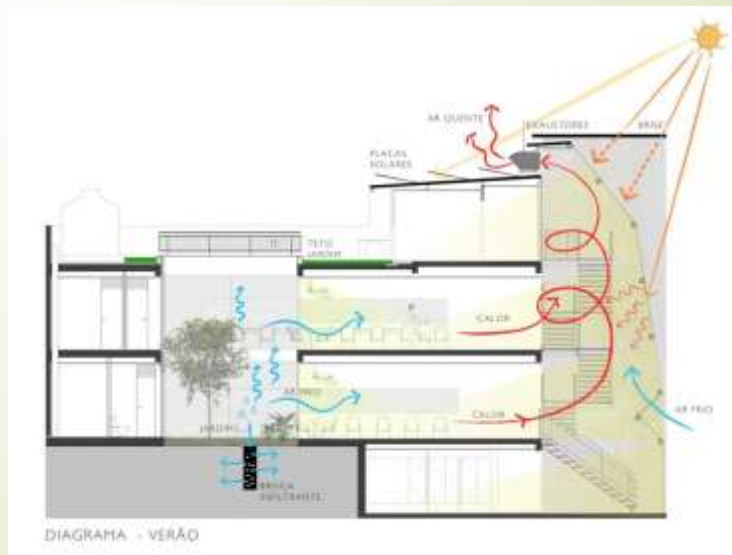
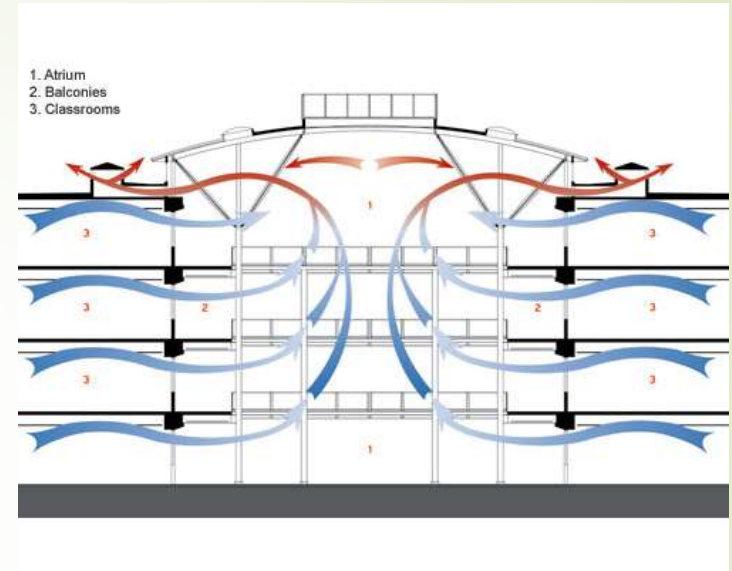




Atrium Ventilation & Infiltration

Atrium Ventilation Design

- Medium-rise Centrally located Atrium addressed.
- What if Atrium located on East, West, North, South?
- Impact of glazing on atrium?
- Thermal mass?
- Low-rise?
- Very tall building?





Infiltration

- How good are we now?
 - What is the quality of existing building stock?
 - What is the quality of newly completed buildings?
- Do we need to improve?



The End.

