

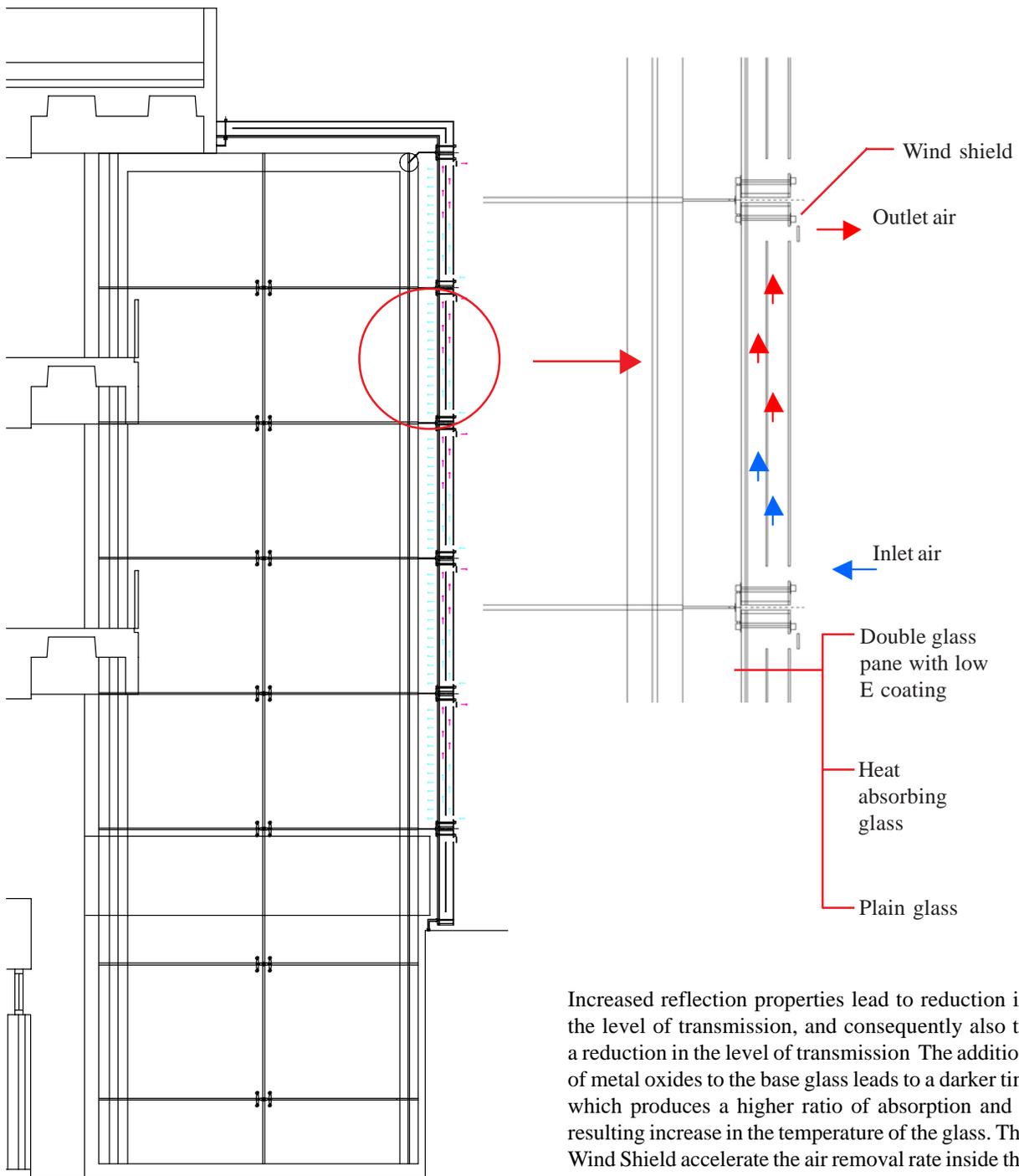
The above image shows temperature distribution across the section of a typical DGF window with wind shield, where red color represents higher temperature and green color represents lower temperature.

The proposed ventilation accelerator improves the performance of the double glass facade. The wind shield not only improves the performance of the double glass facade system, it also provides a desirable architectural condition. The additional piece of glass (or other material) gives the facade an additional layer, so the facade has a three dimensional quality. The design of the wind shield may give other possible benefits, for instance, combining the design of the wind shield and light shelf together.

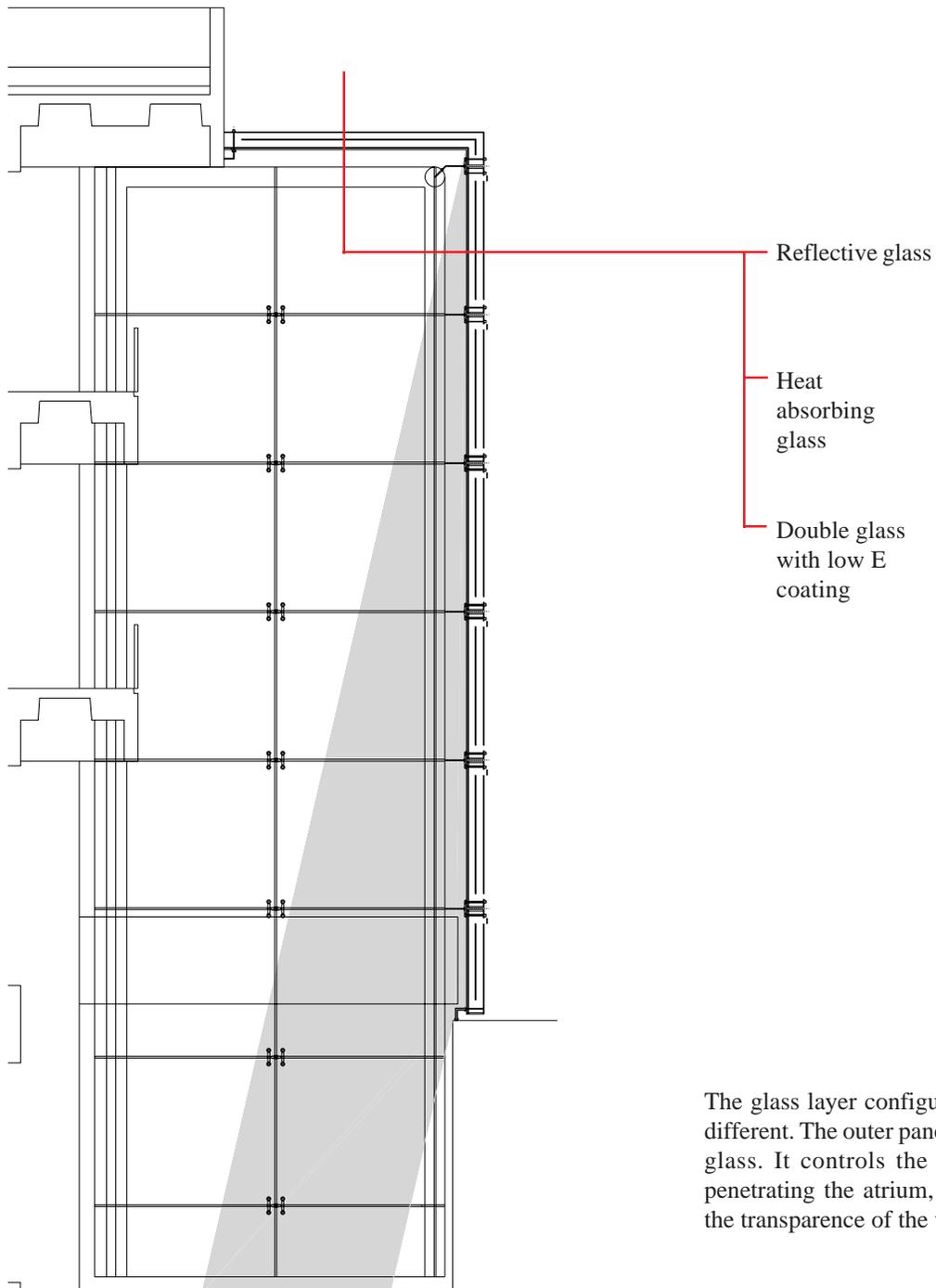


# Ecology

## Application in Cowgill Hall Addition- Glare control



Increased reflection properties lead to reduction in the level of transmission, and consequently also to a reduction in the level of transmission. The addition of metal oxides to the base glass leads to a darker tint which produces a higher ratio of absorption and a resulting increase in the temperature of the glass. The Wind Shield accelerates the air removal rate inside the cavity. Overall the Double Glass Facade reduces the heat gain in summer and heat loss in winter when compared to typical window systems.



The glass layer configuration of the roof is different. The outer pane of glass is reflective glass. It controls the amount of daylight penetrating the atrium, without diminishing the transparency of the volume.

# Conclusion

---

The three challenges of this project are to maintain Volumetric Transparency, achieve environmental integration goals, and accomplish structural lightness.

Structure, space, ecology, the three issues are both independent and interdependent. How to reconcile the contradictions and make them benefit from each other is the key to success.

Although the structure will diminish the portion of transparency, the found structural solution of lightness becomes a statement of spatial elegance.

Although the all-glass box building brings some sustainable worries, the proposed double glass facade minimizes the drawback and maximizes the spacial transparency.

Although the double glass facade performance is not highly associated with aesthetics and it is often for aesthetic reasons the double glass facade is used, thorough consideration of combining the technology and aesthetics brings the conventional double glass facade a 3-dimensional quality and enhancing the ecological performance simultaneously.

I see this thesis is rather asking one question than offering one solution and hope it is a first step toward further investigation of tremendous future potentials of how ecological elements serve as aesthetic ones.



*Intelligent Glass Facades : Material, Practice, Design*  
by Andrea Compagno. Zurich: Artemis, C1995

*The Technology of Ecological Building : Basic Principles  
and Measures, Examples and Ideas*  
by Klaus Daniels ; English translation by Elizabeth  
Schwaiger. Basel; Boston: Birkhauser Verlag, C1997

*A Protocol to Determine the Performance of South  
Facing Double Glass Facade System: a Preliminary  
Study of Active/Passive Double Glass Facade Systems*  
by Shang-Shiou Li. Blacksburg, VA, University libraries,  
Virginia Tech.,2001

<i>1995-2000</i>	<i>Bachelors of Architecture</i>	<i>Tsinghua University</i>	<i>Lu Wang</i> <i>Beijing, China</i>
<i>2000-2005</i>	<i>Master of Architecture</i>	<i>Virginia Tech</i>	<i>Blacksburg, VA, US</i>
<i>2002-2003</i>	<i>Staff Architect</i>	<i>Lavigne Associates Architects</i>	<i>Alexandria, VA, US</i>
<i>2003-2004</i>	<i>Intern Architect</i>	<i>Samaha Associates Architects</i>	<i>Fairfax, VA, US</i>

## *Acknowledgment*

---

*This book is dedicated to my committee professors: Jim Jones, Bill Galloway and Hunter Pittman. Thanks for their patience, encouragement and unconditional support on the process of this thesis production. They enlightened me the way of improving design through technological method and broadened my horizon of perceiving architecture in a new realm.*

*Special appreciation is also to my studio friends, thanks for their intelligence, humor and company.*