No Bird Left Behind

Bird Interactions with Tall Structures and
How to Reduce the Risk

Solving The Problem: Glass Coatings
Viracon
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Solving The Problem!

- Solutions already exist!
- May involve more than the just the glass!
- More research may be required for new coatings!
- Further improvements can be made with current and new technology!

Commercial Building Glass

- Glass is used in virtually every type of building to allow for viewing and natural daylight.
- Economical Building Cladding Material
- Most Prominent Building Component
- Architects Determine Look
- Energy Codes Dictate Performance Level

**Minneapolis Skyline
Variety of
Building Designs**

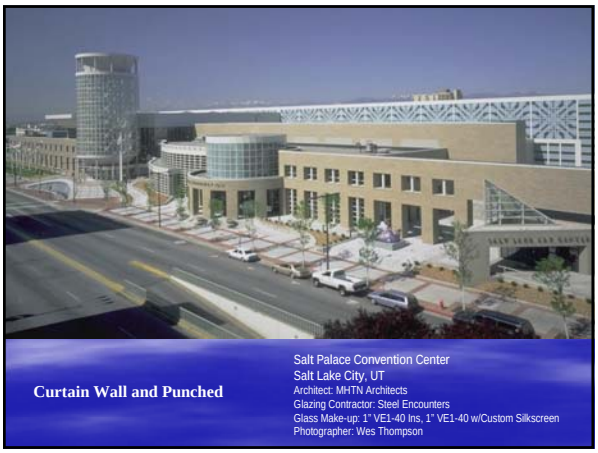
First Bank Place
Minneapolis, MN
Architect: Pei Cobb Freed & Partners
Glazing Contractor: Harmon Contract 660
Glass Make-up: (1) VS1-20 1" Ins Vision
(2) ¼" Monolithic
Photographer: Phillip Prowse

Today's Building Design

- Low Rise Buildings Can be Anything
  (Curtain Wall, Punched Openings, Strip Windows)
- High Rise Structures Trend Toward "All Glass Look" (Curtain Wall)
- Multitude of Glass Color/Reflectivity/Visual Options Available

**Typical Curtain Wall
Construction**

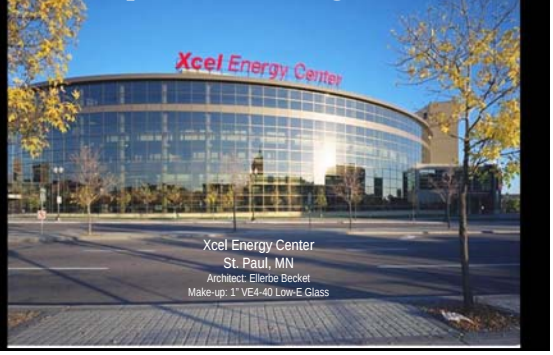
Centrum Office Building
Redwood City, CA
Architect: Gensler & Associates
Glazing Contractor: Walters & Wolf Glass Company
Glass Make-up: VS-6-14 ½" Monolithic Vision Spandrel, HS Monolithic
Photographer: Wes Thompson



Glass Coatings (Enhancements)

- Reflective Coatings (Varying Degrees)
- Transparent Coatings (Varying Degrees of Light Transmittance)
- Silk Screen Patterns
- Certain Combinations of Coatings & Silk Screen Patterns May Be Best
- Other Building Designs

Transparent Coatings Expose the Buildings Interior



Xcel Energy Center
St. Paul, MN
Architect: Ellerbe Becket
Make-up: 1" VE4-40 Low-E Glass

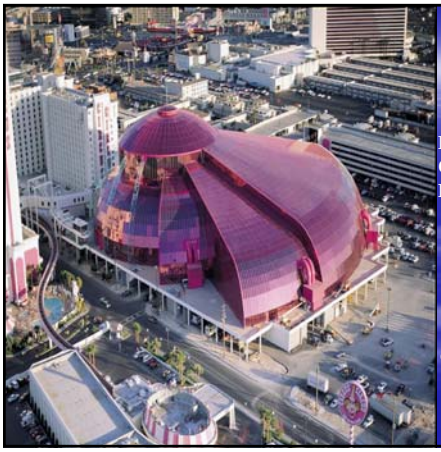
Highly Transparent Glass

Phoenix Central Library
Phoenix, Arizona
Architect: bruder DWL architect
Glazing Contractor: B & B Glass
Glass Make-up: 1" VE2-85Low-e on Green Glass

Opaque Glass Helpful?

Higher Visibility?

Pacific Design Center
Los Angeles
Architect: Cesar Pelli & Associates, Inc.
Glazing Contractor: Model Glass Company
Glass Make-up: (1) Green Monolithic
Photographer: Wes Thompson



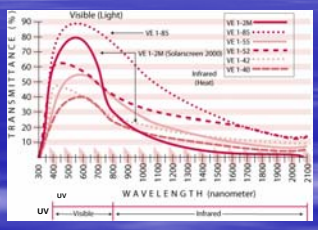
Do Bright Colors Offer Higher Visibility?

Grand Slam Canyon
Las Vegas, Nevada
Architect:
Veldon-Simpson, Inc.
Glazing Contractor:
Super Sky
Glass Make-up: 1 1/4" Opticolor

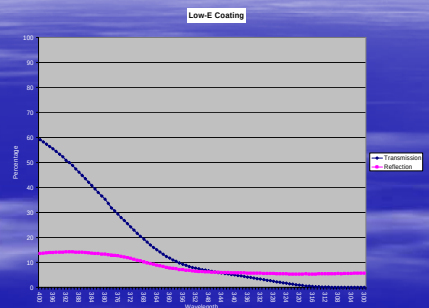
VX1-LB #3 T-L-I

What Birds Do See ?

- Can see Ultra-Violet spectrum 300-400nm
- Glass with Low E coatings typically transmit/absorb UV in this region



Coating Reaction in UV Range



What Birds Do (not) See ?

- Visual Signals such as:
  - Exterior building elements (canopies, awnings, etc)
  - Decorative elements such as silk screened glass
- Can be attracted to lights inside the building
- No concept of reflections (Glass coatings & surface)
- Glass as a barrier

Physical Enhancements

- Wall Features (Projections)
- Combination of Wall Components (Transparent, Opaque, Patterned)

Silk Screen Patterns

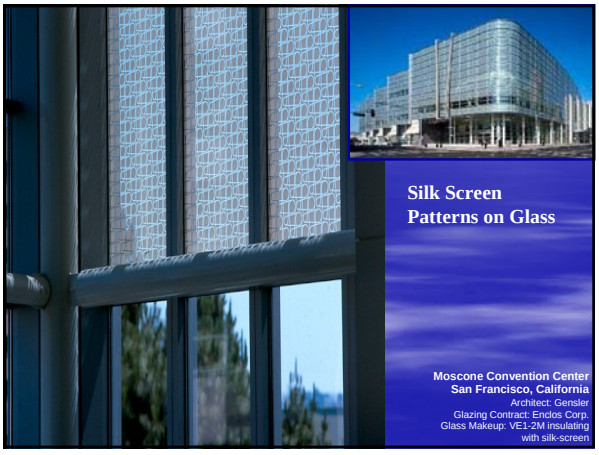
A combination of patterns and colors can create a visible barrier

Duke
Durham, North Carolina
Glazing Contract: Harris/Cartner
Glass Makeup: Clear laminated with silk-screen

Silk-Screen Patterns

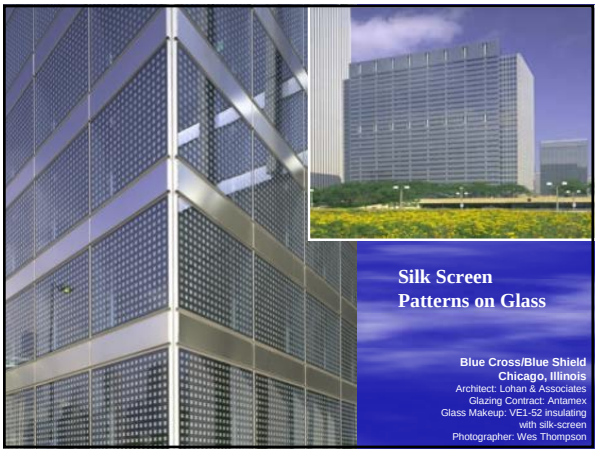
Allow for creativity, functionality by using patterns and color, that cannot be achieved through other methods of glass fabrication.

Grandview Community Center
Grandview, MO
Architect: Gould Evans Goodman and Ankeny Kell Architects
Glazing Contract: JPI Glass
Glass Makeup: VE1-55 insulating with silk-screen



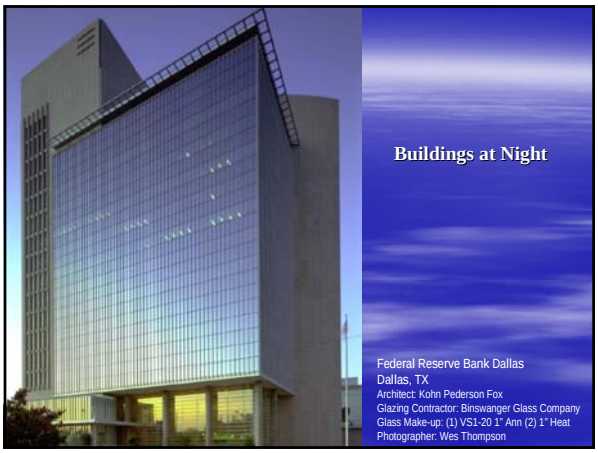
Silk Screen Patterns on Glass

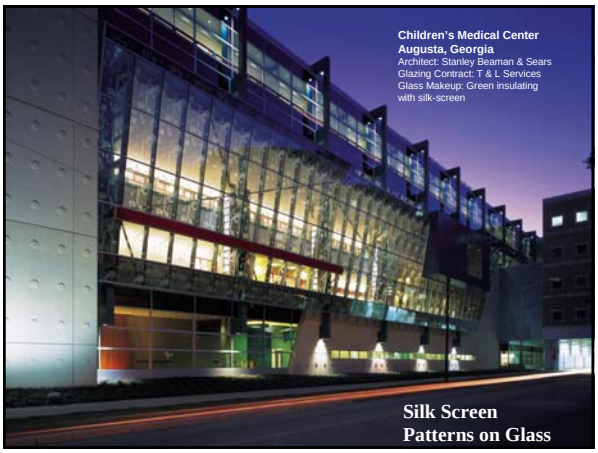
Moscone Convention Center
San Francisco, California
Architect: Gensler
Glazing Contract: Enclos Corp.
Glass Makeup: VE1-2M insulating with silk-screen



Silk Screen Patterns on Glass

Blue Cross/Blue Shield
Chicago, Illinois
Architect: Lohan & Associates
Glazing Contract: Antamex
Glass Makeup: VE1-52 insulating with silk-screen
Photographer: Wes Thompson





In Conclusion

- Understanding the issue is critical to designing buildings to be bird safe.
- Architectural community becoming more involved up front.
- Glass industry is involved.
- R&D effort may be required for new coatings.
- Silk Screen Pattern & Coatings Provide Solutions Today!