Provider Number: K216

Bird-Friendly Glazing Challenges and Solutions

Course Numbers
AIA: WA1311-23
USGBC: 0910000178

Credit(s) earned on completion of this course will be reported to AIA CES for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

Copyright Materials

Walker Glass Company Ltd.

WALKER

COURSE DESCRIPTION

The number of cities across North America adopting bird deterrence legislation is growing. This course will cover critical aspects that will be helpful to architects designing buildings that will reduce significantly the number of bird collisions and have a positive impact on the environment and biodiversity. This session will cover the most up-to-date and detailed information on bird migration, behaviour, risk factors, and key research findings, as well as the latest updates on current and pending legislations and standards across North America. Participants will learn how to appropriately use glass solutions such as acid-etched glass and transparent UV markers that will reduce the risk of deadly bird collisions. Ultimately this course will ease and improve the decision-making process for bird-safe building designs.

LEARNING OBJECTIVES

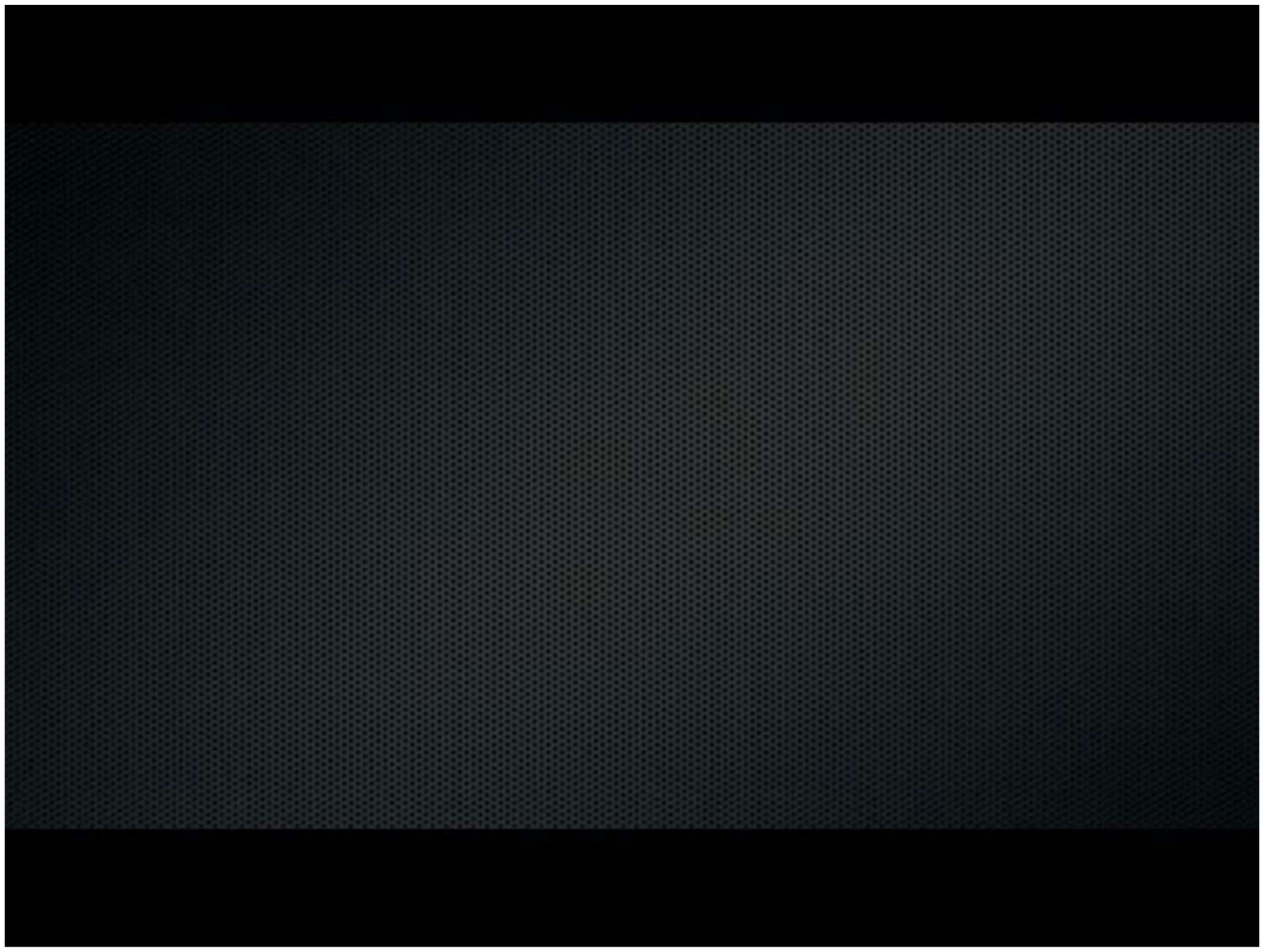
The participants will:

- Gain a basic understanding of birds, their environmental importance, the magnitude of the ecological impacts of bird-glass collisions;
- Understand what causes birds to collide with glass and the most important risk factors to consider when designing bird-friendly buildings;
- Learn how research and key findings from the last decades can help you reduce bird collision risks in your designs;
- Learn about the latest bird-friendly legislation and standards in North America, and the role they play in your specifications;
- Learn about effective solutions and actual case studies where acid-etched glass and transparent UV markers were successfully used to prevent bird collisions.

UNDERSTANDING

BIRDS

Hitting Glass… In Motion! MP0



Diapositive 7

MP0 Anything you want to change here? Too long?
Marion Pynn; 2023-07-07T13:19:52.084

Northern Flicker

IMPORTANCE OF BIRDS

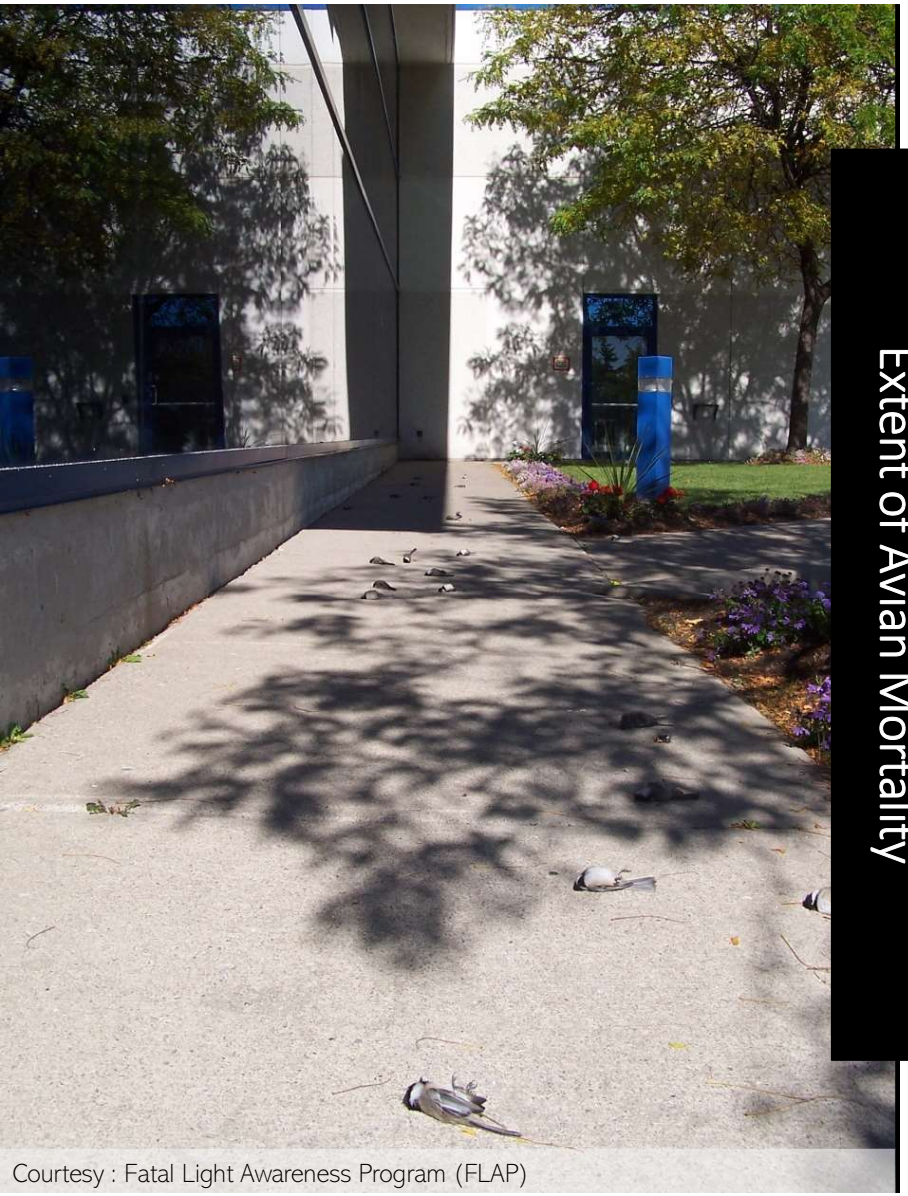
- Bird population changes can indicate broader changes in biodiversity, making bird life a useful barometer for environmental changes.
- Wild birds provide the greatest restraint on insect populations.
- Birdwatching is a major source of revenue worldwide.

Source: Bird Life International

IMPORTANCE OF BIRD CONSERVATION

Causes of Avian Mortality

- 10 to 40 thousand from wind turbine strikes
- 60 million from vehicle road-kills
- Hundreds of millions by domestic cats



Extent of Avian Mortality

Courtesy : Fatal Light Awareness Program (FLAP)

IMPORTANCE OF BIRD CONSERVATION

Causes of Avian Mortality

- 600 million to 1 billion deaths from collision with buildings each year, in USA alone

- It is estimated that there are 5 – 10 billion total birds in North America at any given time.

Source: Bird Life International

Diapositive 10

MP0 According to Loss & Scott, it's 365M to 988M in USA. Check source.
Marion Pynn; 2023-07-03T15:58:21.964

Courtesy: Fatal Light Awareness Program (FLAP)

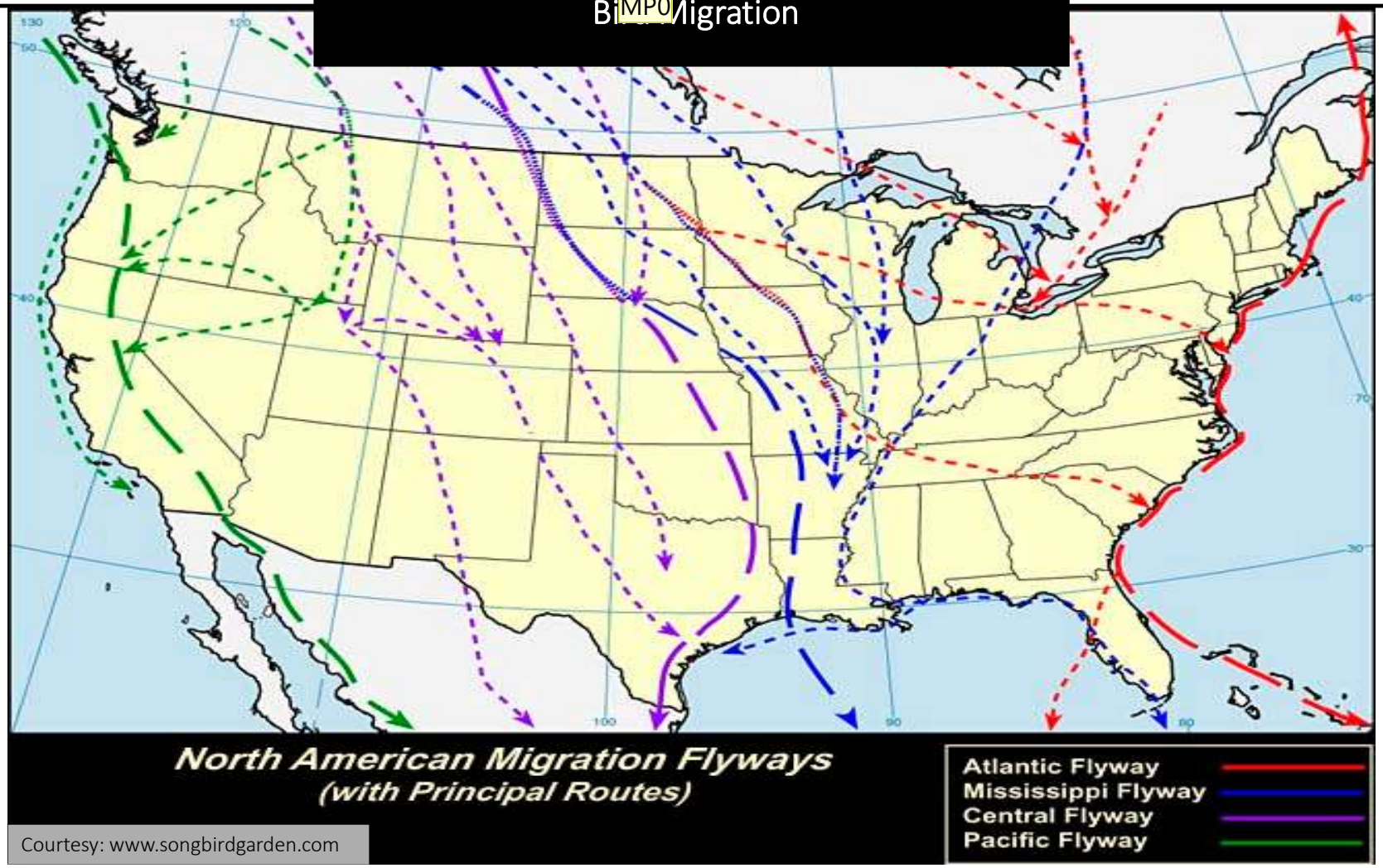

THE MAGNITUDE OF
THE PROBLEM

BIRD MIGRATION

- Bird collisions occur year-round and peak during the migration period.
- Birds travel both daytime and nighttime between breeding and wintering grounds.
- Migratory patterns alternate flight with stopovers in wild areas, cities, suburbs and parks.
- At least 4,000 bird species are regular migrants, representing about 40 percent of the global bird population.

Ruby-throated Hummingbird

Bird Migration



Courtesy: www.songbirdgarden.com

Diapositive 14

MP0 Should marketing re-do this map for better aesthetic?
Marion Pynn; 2023-07-07T13:22:25.646

BIRD

COLLISIONS

RISK FACTORS: GLASS PROPERTIES

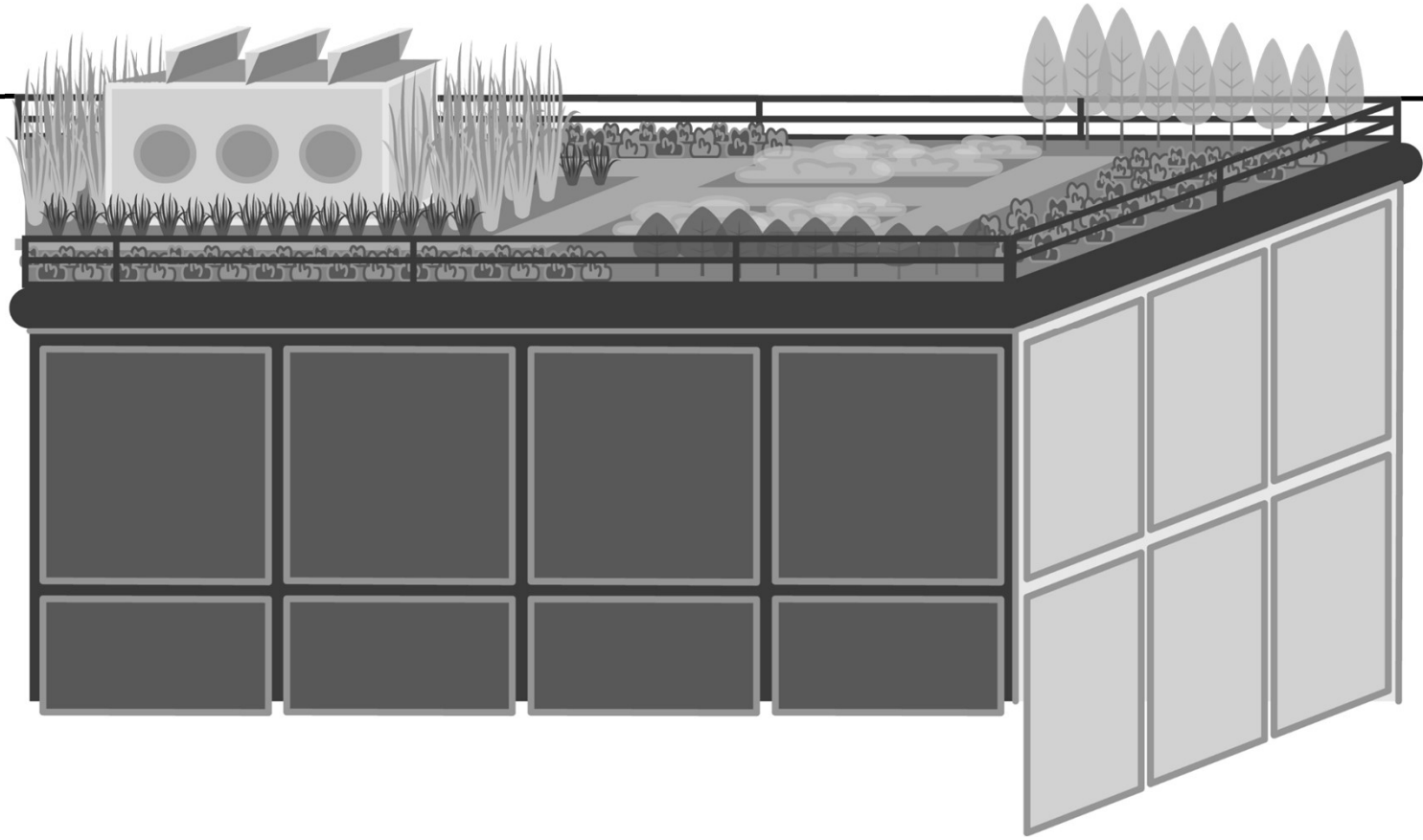
- Reflection: Glass can be attractive to birds when it reflects the sky, clouds, or nearby habitat.
- Transparency: Collisions occur as birds attempt to reach perches, plants, water sources and other lures seen through glass.
- Passage effect: In certain lighting conditions, glass can appear black, creating the appearance of a safe passage for birds.

RISK FACTORS

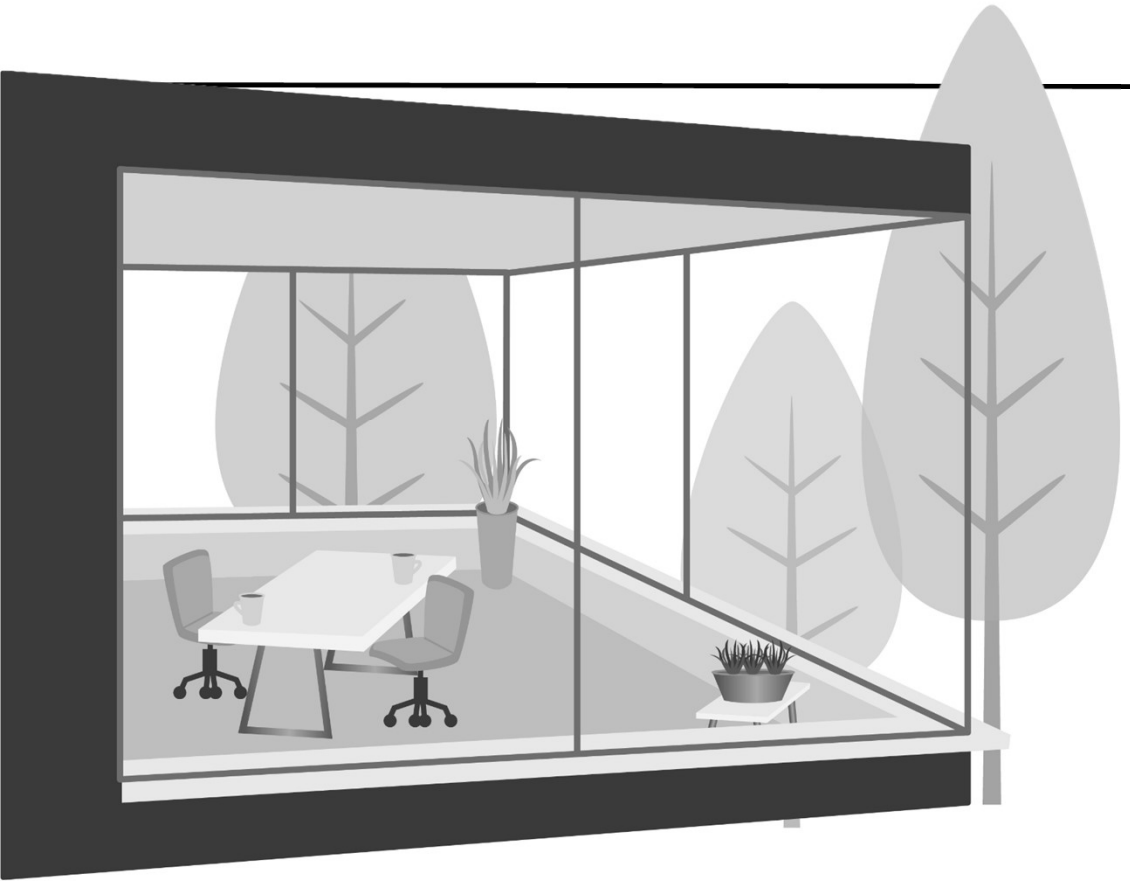
DANGER ZONE

RISK FACTORS

GREEN ROOF



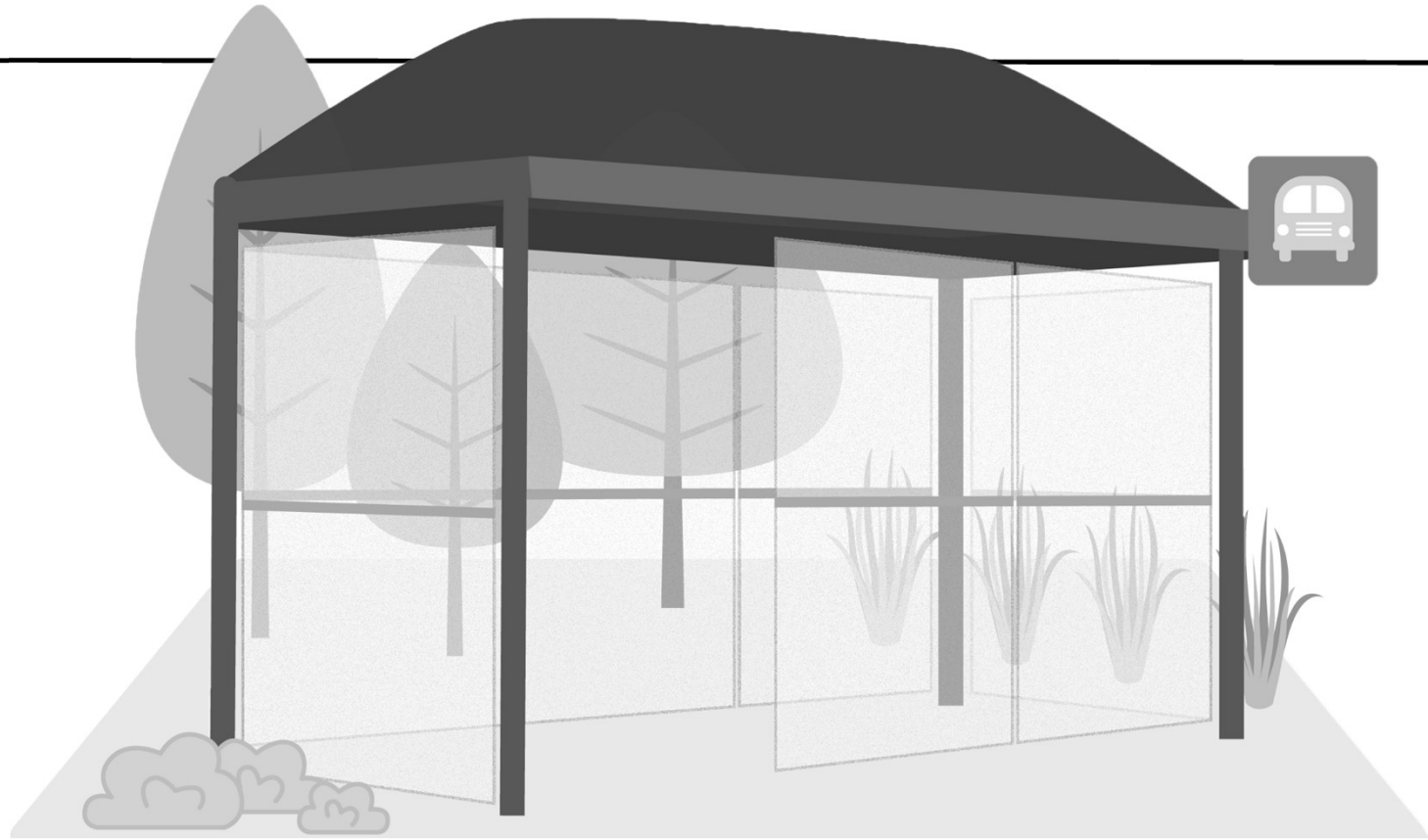
RISK FACTORS
GLASS CORNERS



RISK FACTORS

OTHER GLAZED STRUCTURES

- Balconies
- Shelters (bus, train)
- Balustrades
- Etc.

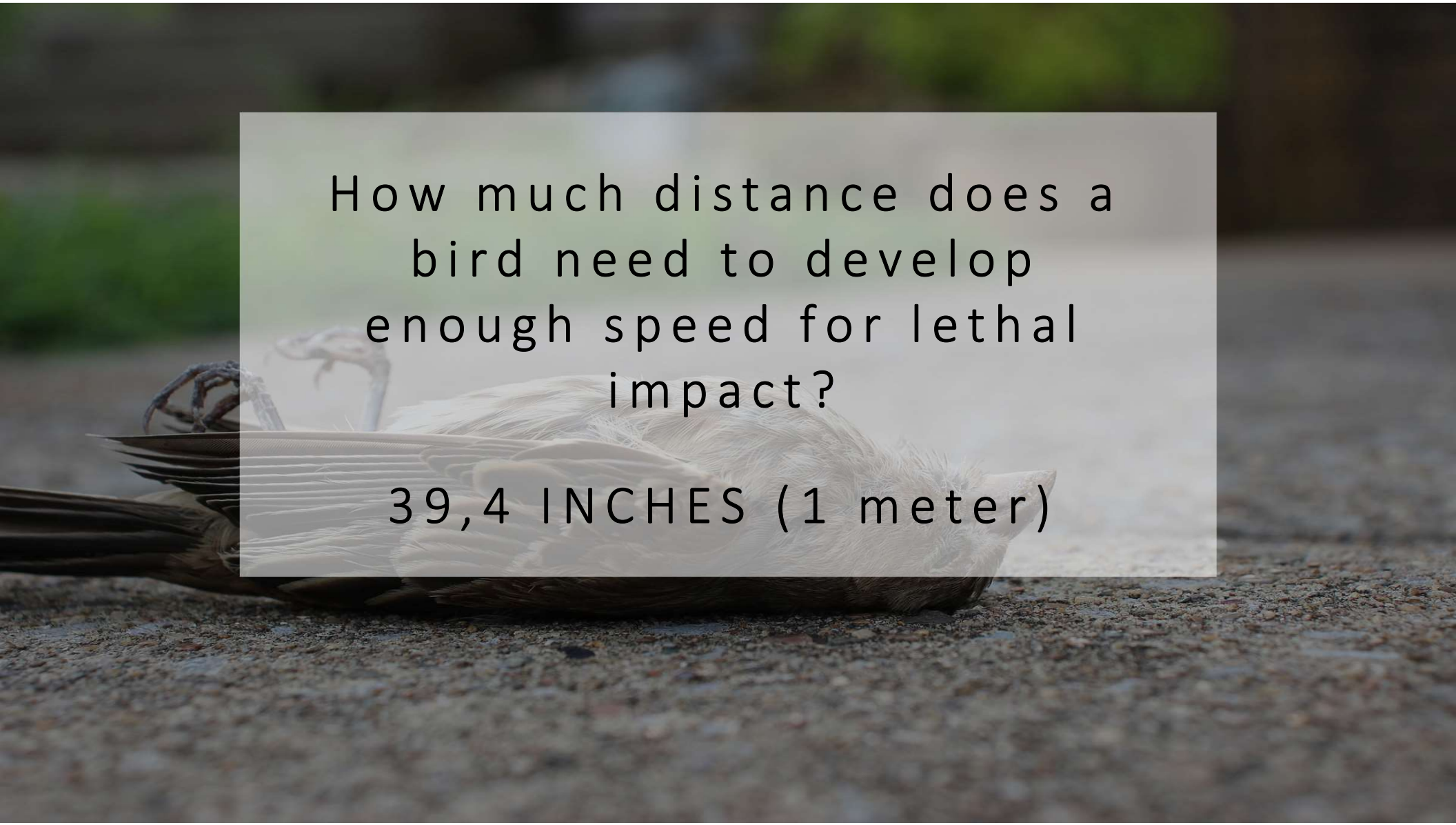


ASSESSING THE RISK OF BIRD COLLISIONS: FACTORS TO CONSIDER

- Volume of glass in a building;
- Light escaping from building interiors or from exterior fixtures;
- Density & species composition of local bird populations;
- Local geography.

ASSESSING THE RISK OF BIRD COLLISIONS: FACTORS TO CONSIDER

- Type, location and extent of landscaping and nearby habitat;
- Prevailing wind and weather;
- Patterns of bird migration through the area.


How much distance does a bird need to develop enough speed for lethal impact?
39,4 INCHES (1 meter)

RESEARCH

& KEY FINDINGS

RESEARCH ON BIRD-WINDOW COLLISIONS

- Casualties are documented on panes of all sizes in single and multilevel residential and commercial buildings.
- Visual markers for birds are different from those for humans.
- Birds are sensitive to contrast.
- Birds' midbrains are not as sensitive to signals while in motion.

Common Yellowthroat

RESEARCH ON BIRD-WINDOW COLLISIONS

Dr Daniel Klem Jr.

Dr. Daniel Klem Jr.

- Professor of Ornithology and Conservation Biology, Muhlenberg College
- Ph. D. Zoology, Southern Illinois University at Carbondale

Dr. Christine Sheppard

- Bird Collisions Campaign Manager, American Bird Conservancy
- Ph.D. Cornell University

Martin Rössler

- Ornithologist, Dept. Integrative Biology and Biodiversity Research, University of Natural Resources and Applied Life Sciences, Vienna, Austria

Diapositive 26

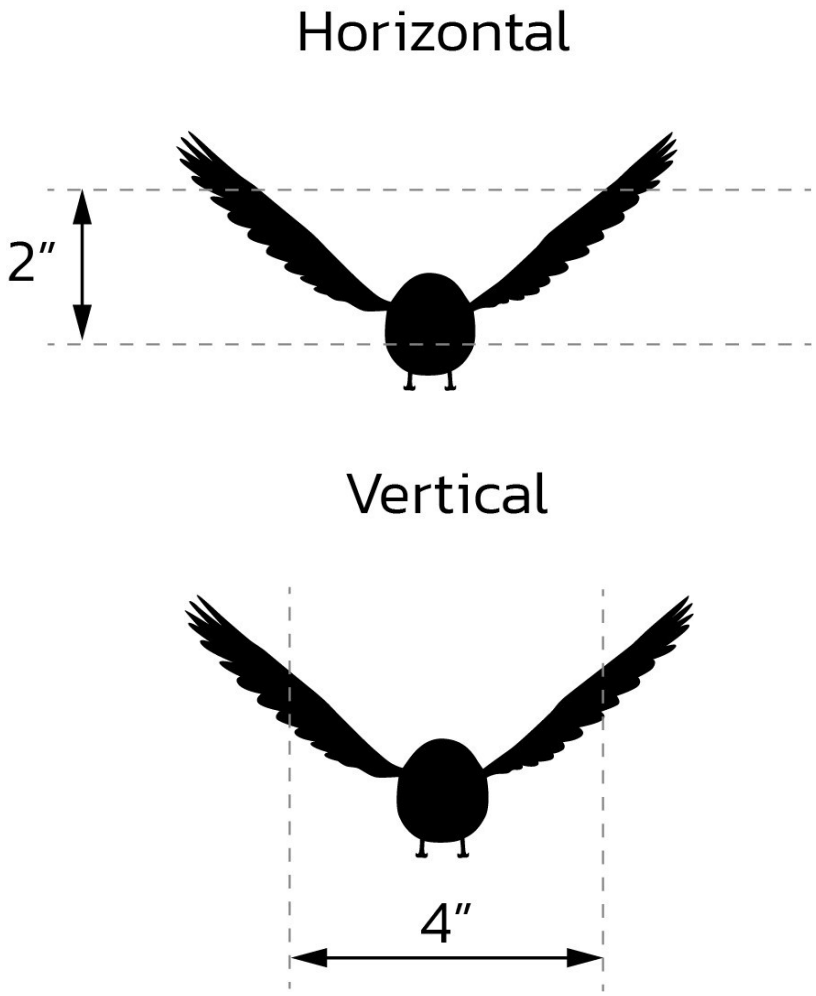
MP0 Research: is he a PhD Dr.?

Marion Pynn; 2023-07-07T13:30:01.240

RESEARCH ON BIRD-WINDOW COLLISIONS:

EFFECTIVENESS OF VISUAL SIGNALS

- Klem (1989-90): Patterns on glass panes are most effective if spaced two to four inches apart.
- Rössler (2004-2009): Patterns covering parts of the glass surface can be effective.
- Klem (2009): A ceramic frit dot pattern on the entire glass pane can be effective if applied on the outside of the window.
- Klem (2009): One-way films rendering a window opaque when viewed from the outside are also effective bird-safe solutions.



RESEARCH ON BIRD-WINDOW COLLISIONS: EFFECTIVENESS OF VISUAL SIGNALS

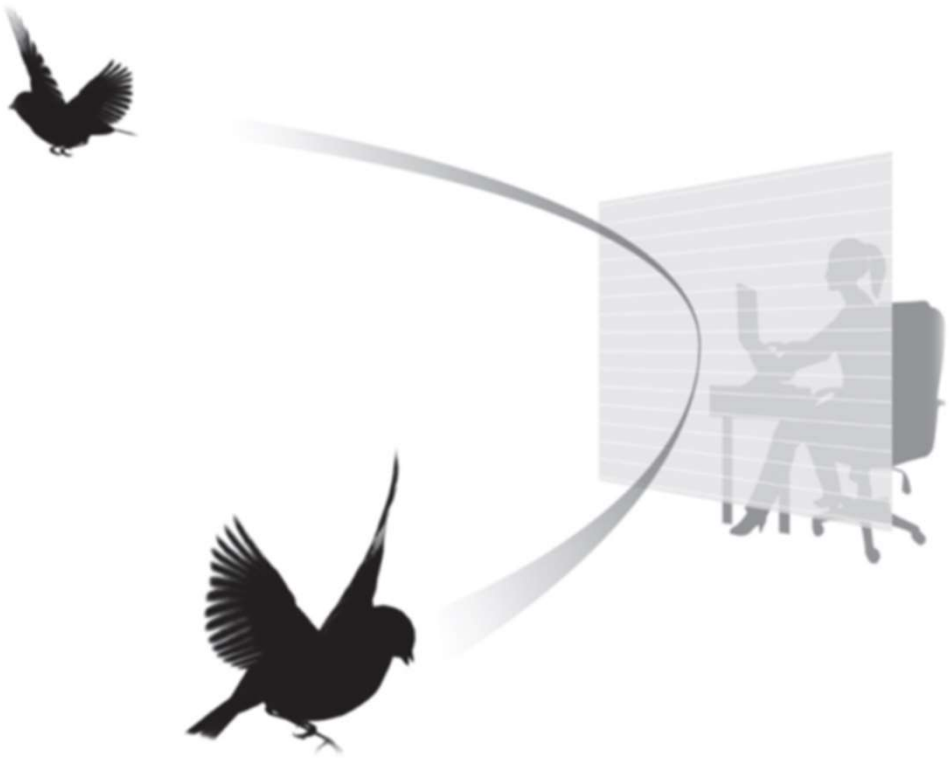
Early findings by Dr Daniel Klem in 1990 / American Bird Conservancy (ABC) (2011)

To be effective, the pattern must uniformly cover the entire window, and consist of elements of any shape (lines, dots, other geometric figures, etc.) separated by no more than 5 cm (2 inches) if oriented in horizontal rows, or by 10 cm (4 inches) if oriented in vertical columns.

Current trend is moving towards 2'' x 2'' spacing.

RESEARCH ON BIRD-WINDOW COLLISIONS: EFFECTIVENESS OF VISUAL SIGNALS

- ABC (2011): Pattern geometry is more important than density. Stripes are more effective than dots
- ABC (2011): Patterns on the outer surface of the glass are very effective.
- Klem (2013): UV signals with wavelengths of 300 to 400 nanometers are most effective.
- Klem (2013): Bird-safe methods applied to surface 1 are most effective.



LEGISLATION

& STANDARDS

PERFORMANCE & PRESCRIPTIVE STANDARDS - USA

- There is no national standard, either performance-based or prescriptive
- GSA - Federal Bird-Safe Building Act
- Two test methods have been developed:
  - Tunnel test - ABC
    - Method has major flaws and does not report reliable results
    - Measures bird strikes based on transparency only, not reflection
  - Field experiments – Dr. Daniel Klem
    - Closer to real life conditions, but does not cover/control all key building and environment conditions
- The National Glass Association (NGA) has published a technical reference, their “Bird Friendly Design Guide”, which supports the prescriptive method of bird deterrence.

Testing Methods – Tunnel Test

Courtesy: v-e-n-u-e.com

Testing Methods – Field Test

Courtesy: Dr Daniel Klem Jr.

PRESCRIPTIVE STANDARD - CANADA

MP0

CSA published a prescriptive standard in 2019:

Bird-friendly building design - CSA A460:19

- Elevation treatment
  - 90% of all glazing materials
  - All glazing material that creates fly-through conditions or adjacent to “natural heritage features”
  - 16 meters (52 feet) from gradee
  - 4 meters (13 feet) from green roof
- Visual markers on first surface
- Specifications on geometry and density of markers
  - ex. 4mm (5/32”) dots with maximum 50mm (2”) spacing
- Markers must provide high contrast

Diapositive 34

MP0 Shouldn't this say "Prescriptive"?
Marion Pynn; 2023-07-03T17:30:41.874

LEED INNOVATION CREDIT: BIRD COLLISION DETERRENCE

- Driven heavily by ABC's test method and findings;
- Has not changed since its inception;
- Requires extensive work to calculate an overall threat factor for each building;
- Provides only 1 credit, therefore giving little incentive to design bird-friendly projects;
- In Canada, this credit may also be earned by following the CSA A460:19.

LEED v4.1

EARLY ADOPTERS - TORONTO & SAN FRANCISCO

Toronto

- Markers must be spaced ≤ 2'' x 2'' (50mm apart).
- 85% of the first 40' from grade must be treated.
- Acid-etch, frit, UV products and films are acceptable.
- Visual markers on surface 1 are mandatory.
- Must treat 13' (4m) above a green roof.

San Francisco

- Treatments must adhere to basic "2 x 4" rule.
- 90% of first 60' from grade must be treated.
- Acid-etch, frit, UV products and films are acceptable.
- Rules apply to buildings within 300' of two or more acres of water/vegetation.
- Untreated glass or glazing must cover less than 35% of the building façade.

Toronto was a major influence on the development of many standards in cities across North America, as well as the CSA A460 standard.

CURRENT LEGISLATION IN CANADA

MP0

(as of June 2023)

Federal

MP1

- MBCA – Migratory Birds Convention Act – 1917 (updated in 1994)
- SARA – Species at Risk Act – 2002
- CSA – A460 (Voluntary) – 2019

Provincial

- EPA – Environmental Protection Act (Ontario) – 1990

City Standards (mandatory)

- Toronto ON, Vaughn ON, Markham ON, Guelph ON, Brampton, ON, Richmond Hill, ON, and others in the GTA

Bird-Friendly Guidelines (voluntary)

- Ottawa ON, Calgary AB, Vancouver BC, University of British Columbia BC (UBC is its own municipality)

Diapositive 37

MP0 MP: Find & replace legislations w legislation
Marion Pynn; 2023-07-07T13:35:27.049

MP1 Update cities based on Matthew's note
Marion Pynn; 2023-07-07T13:36:56.335

CURRENT LEGISLATION IN UNITED STATES

(as of June 2023)

State-Wide

- East:
  - Maryland, DC, Maine, Washington DC
- Midwest:
  - Minnesota, Bird-Safe Glazing (mandatory) – 2015
  - Illinois

- West:
  - State of California – Green Building Standards Code – Appendix C: Bird-friendly Building Design (2010) – Voluntary, Pacific Coastal Commission

CURRENT LEGISLATION IN UNITED STATES

(as of June 2023)

Municipal (Mandatory)

- East:
  - New York City NY, Howard County MD
- Mid-West:
  - Madison WI, Minneapolis MN, Cook County IL, Evanston IL
- West:
  - San Francisco CA, Oakland CA, Emeryville CA, Richmond CA, Alameda CA, Mountain View CA, Berkeley CA, Sunnyvale, CA, Palo Alto CA, Portland OR

Municipal (Voluntary)

- West:
  - San Jose CA

LEGISLATION: NEW YORK CITY

- Bird deterrence approach is based on ABC threat factor. Allows for use of products with TF of 25 or below, with special allowance of TF up to 27 in some cases.
- First 75 feet must be treated.
- Other risk areas such as corners and green roofs must be taken into account.
- Amendment to include bird-safe building best practices is under consideration.

SOLUTIONS

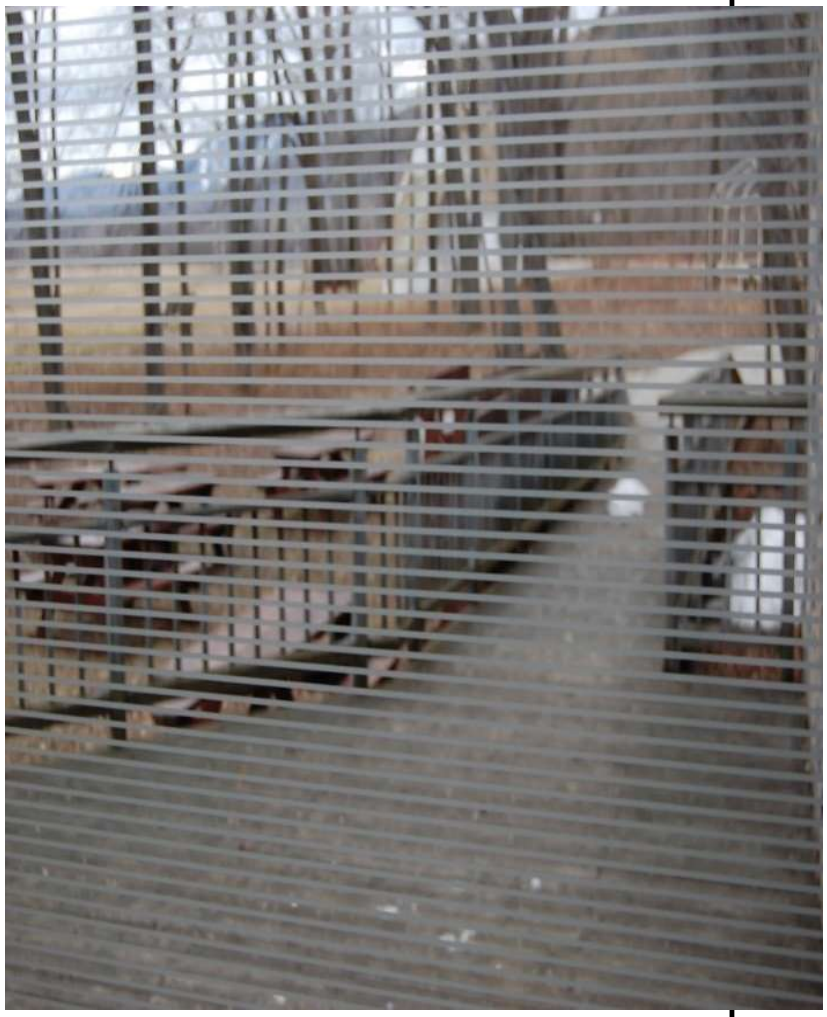
& EXAMPLES

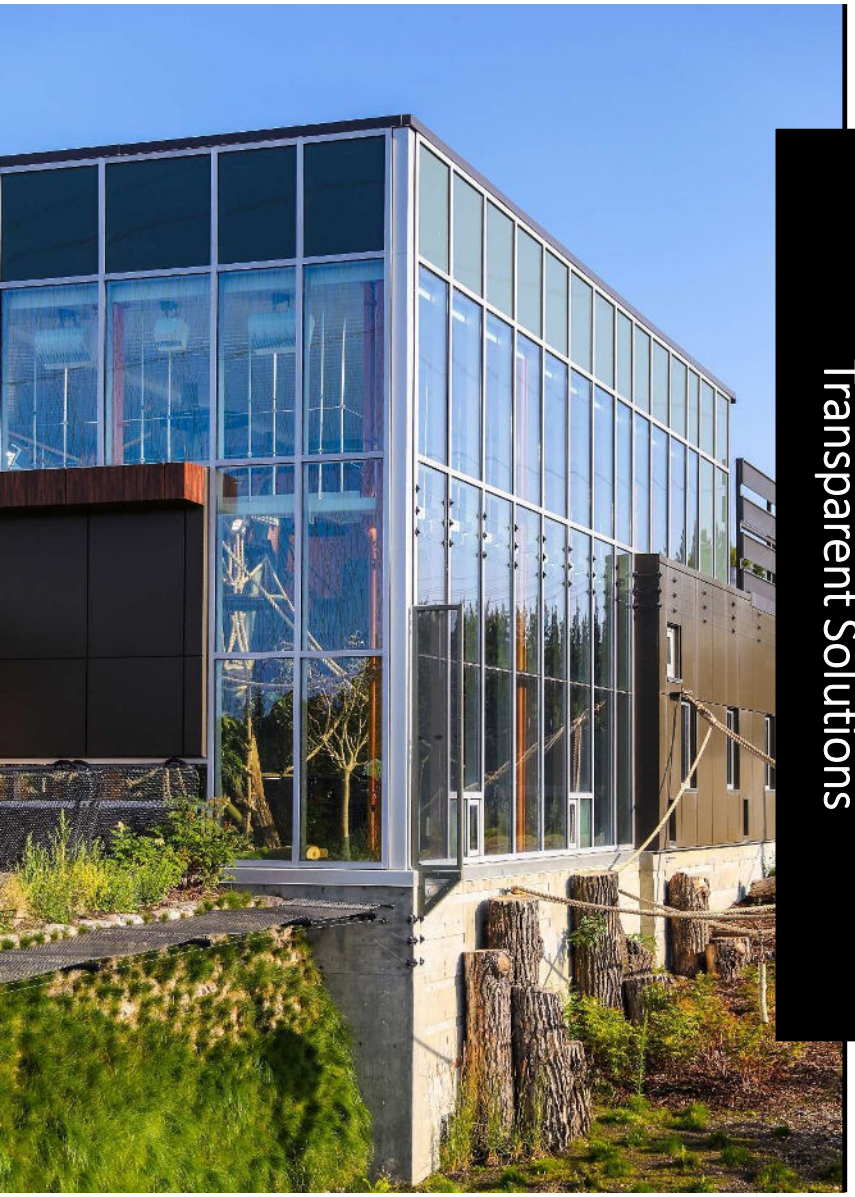
FILMS

- Solution for retrofit applications
- Price greatly influenced by local field glazing costs
- The warranty of the IGU may be void – validation with the manufacturer is recommended!

CERAMIC FRITS

- Highly visible by humans and birds;
- Generally applied on surface 2, in which case low-e coatings cannot be used on surface 2;
- Restricts light flow – lower visible light transmittance into the space;
- If used on surface 1, frit is usually not covered by a warranty.





Transparent Solutions

UV PATTERNS

- Perceived differently by birds and humans;
- Less obtrusive than other visual markers;
- Available either as interlayers (laminates) or as standalone glass products;
- Always combined with low-e, either laminated to the outboard lite or on position 3.

ACID-ETCHED PATTERNS

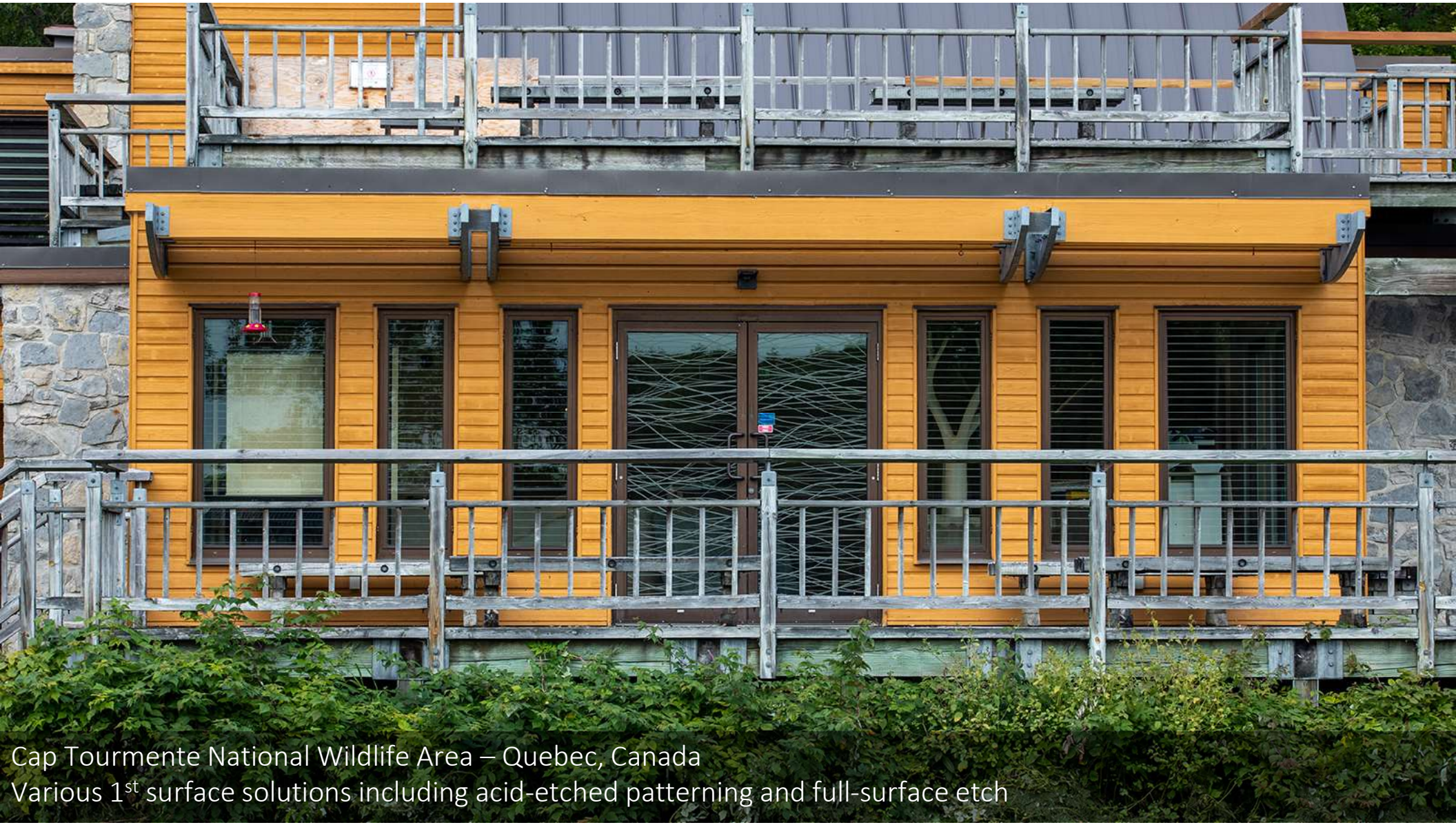
- Visual markers used on the exterior surface of glass;
- Will not change or degrade over time;
- Do not restrict light flow;
- Can be combined with high-performance low-e coating on the same lite;
- The only first-surface solution with a 10-year warranty (from certain manufacturers).

Bird-Safe Glass Visual Marker Options

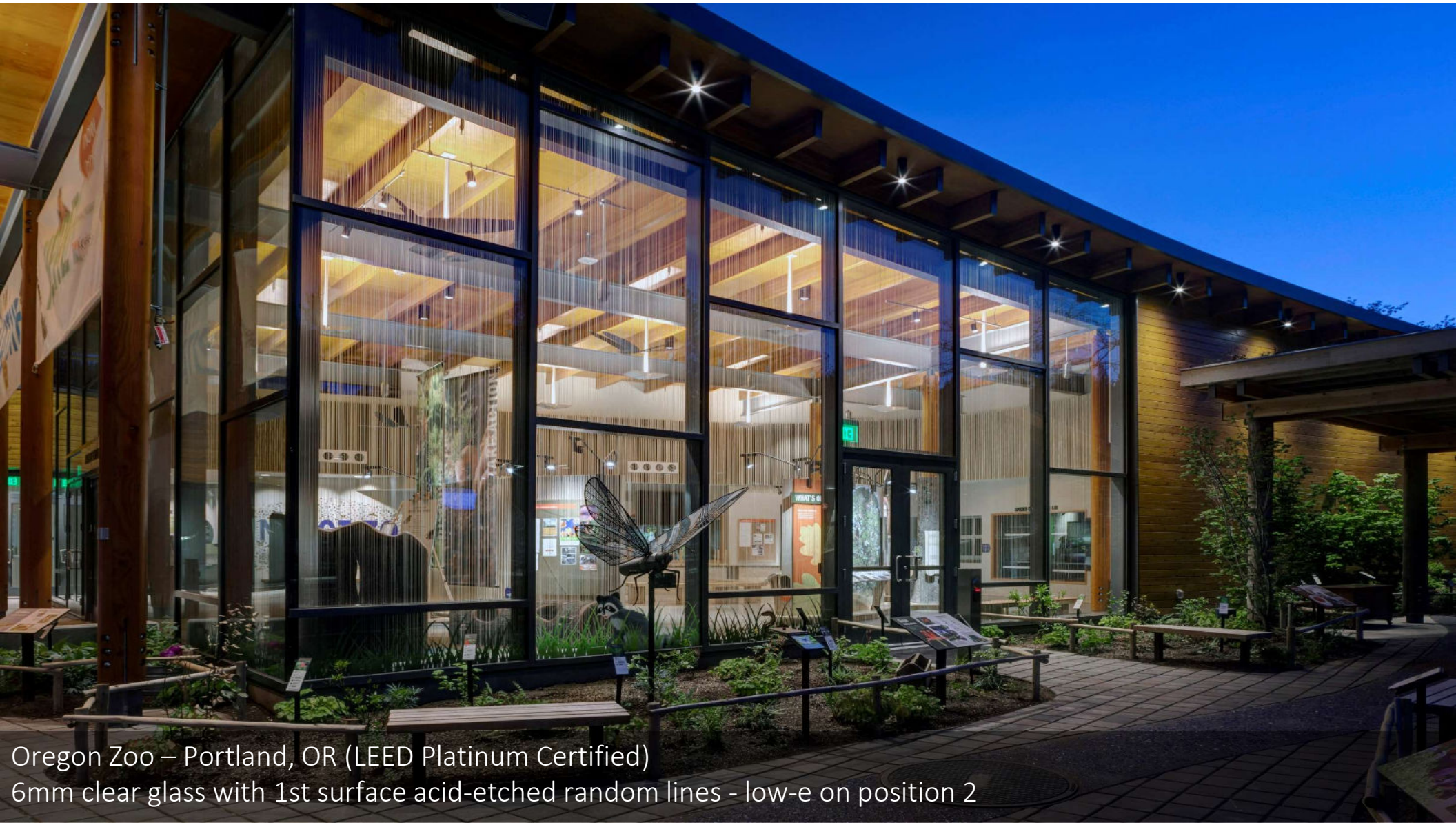
Comparative Analysis	Acid-Etched Glass	Ceramic Frit	UV	Film
Outside Surface (Pos. 1)	Yes	Yes (limited availability and warranty)	Yes	No
High Light Transmission	Yes	No	Yes	No
Reduced Reflection from All Angles	Yes	No	No	No
High Translucency	Yes	No	Yes	No
Post Glazing Installation	No	No	No	Yes
Bird-Friendly Markers on #1 & low-e on #2	Yes	No	No	Yes
Custom Designs Meeting the 2x4 Rule	Yes	Yes	No	Yes

VISIBLE LIGHT TRANSMITTANCE

Description	VLT
6mm clear glass with selected etch - full surface	91%
6mm clear glass with selected etch - 35% coverage	91%
6mm clear glass with Grey Frit - 20% coverage	72%
6mm clear glass with Grey Frit - 40% coverage	55%



Cap Tourmente National Wildlife Area – Quebec, Canada
Various 1st surface solutions including acid-etched patterning and full-surface etch



Oregon Zoo – Portland, OR (LEED Platinum Certified)
6mm clear glass with 1st surface acid-etched random lines - low-e on position 2

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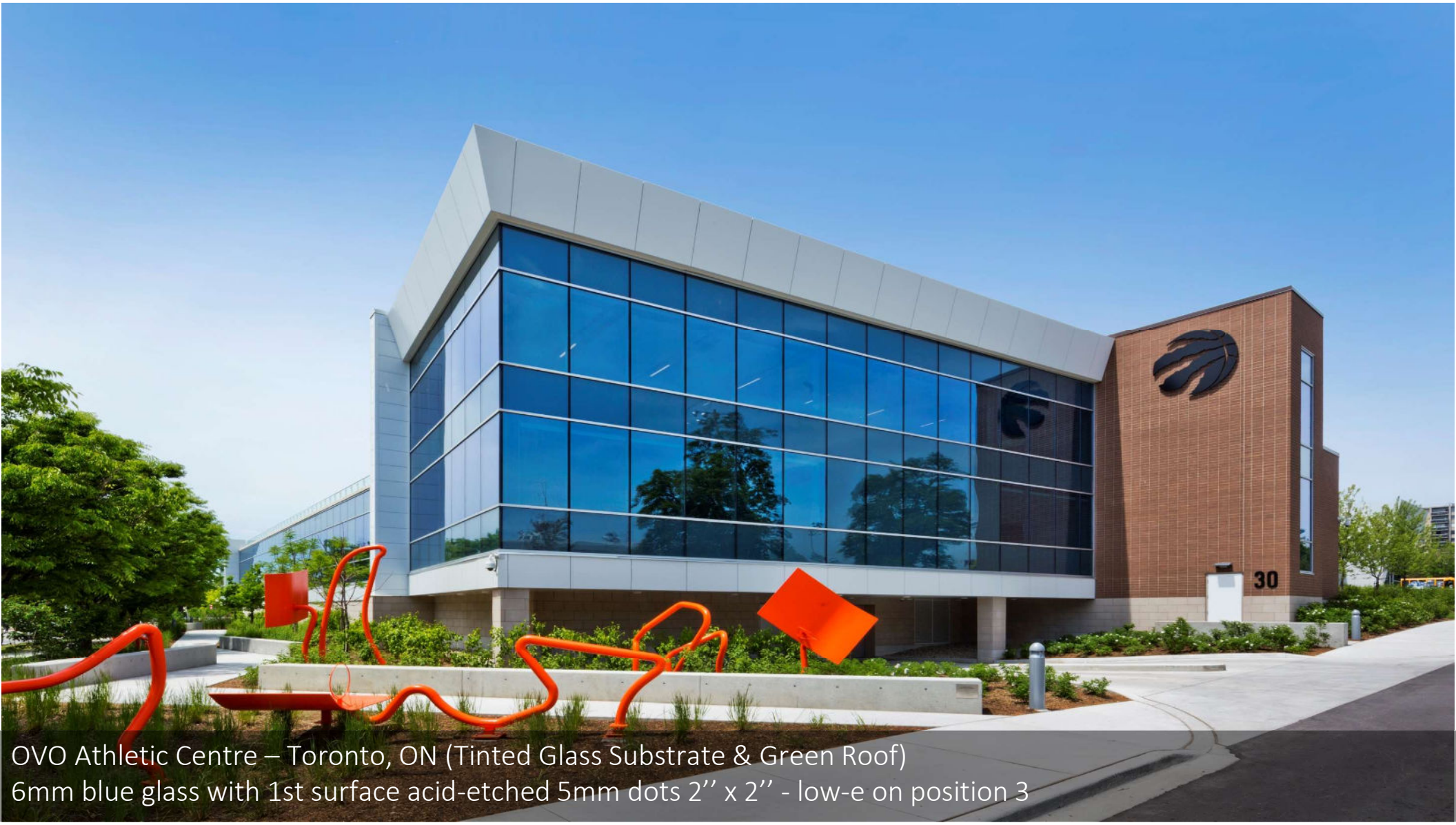
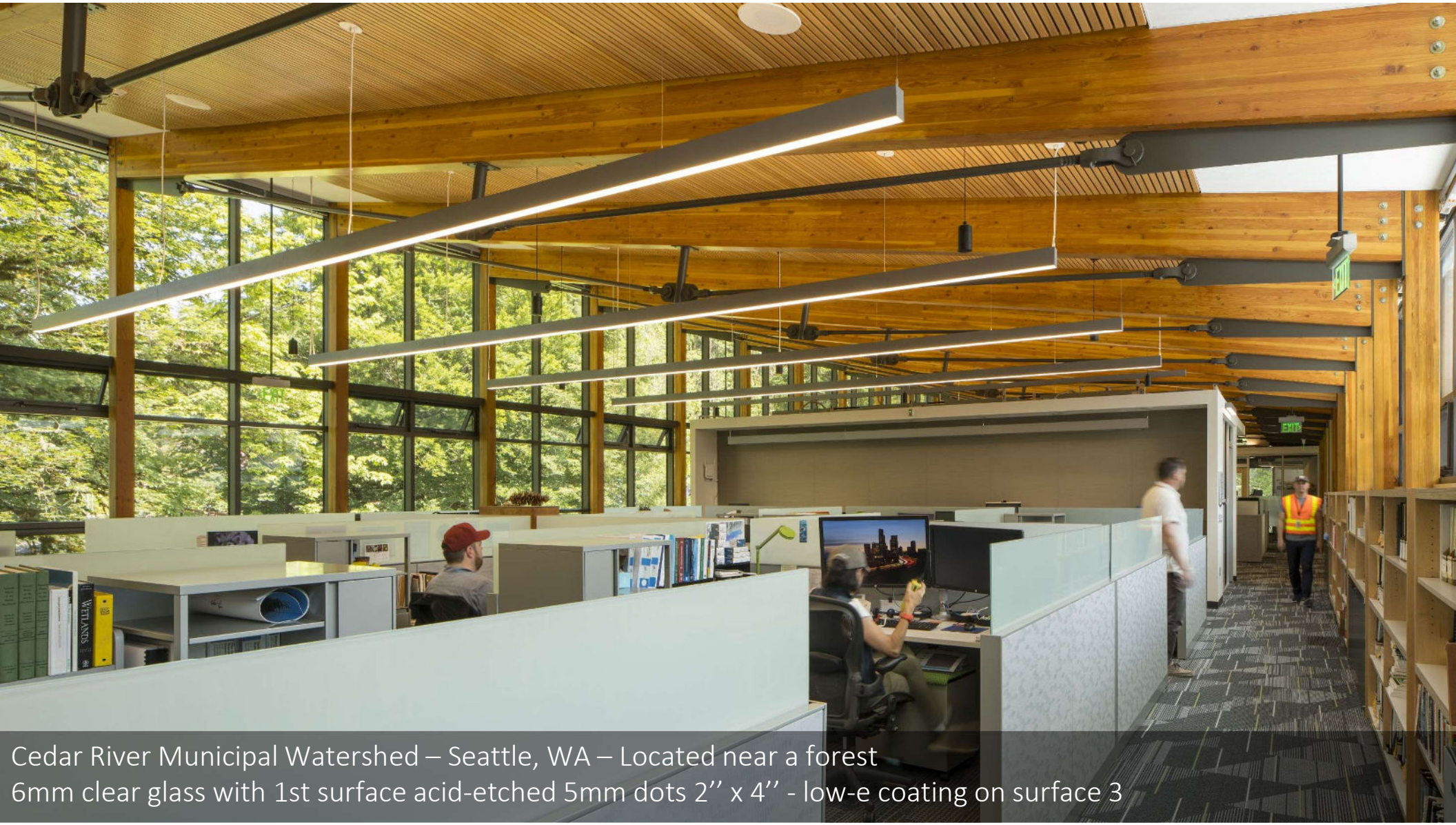
6mm clear glass with 1st surface acid-etched random lines - low-e on position 2



OVO Athletic Centre – Toronto, ON (Tinted Glass Substrate & Green Roof)
6mm blue glass with 1st surface acid-etched 5mm dots 2'' x 2'' - low-e on position 3

OVO Athletic Centre – Toronto, ON (Tinted Glass Substrate & Green Roof)
6mm blue glass with 1st surface acid-etched 5mm dots 2’’ x 2’’ - low-e on position 3

Cedar River Municipal Watershed – Seattle, WA – Located near a forest
6mm clear glass with 1st surface acid-etched 5mm dots 2’’ x 4’’ - low-e coating on surface 3



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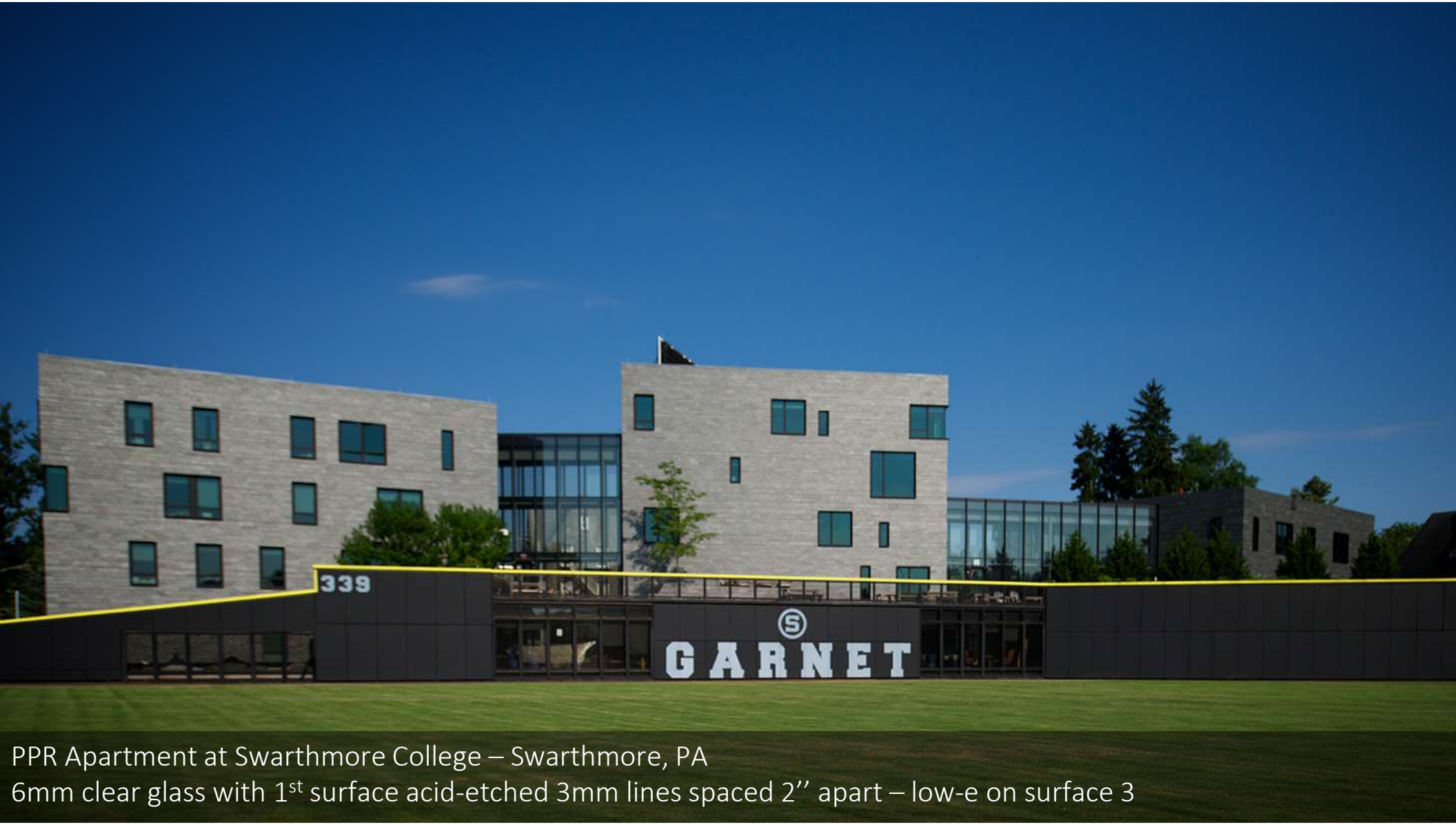
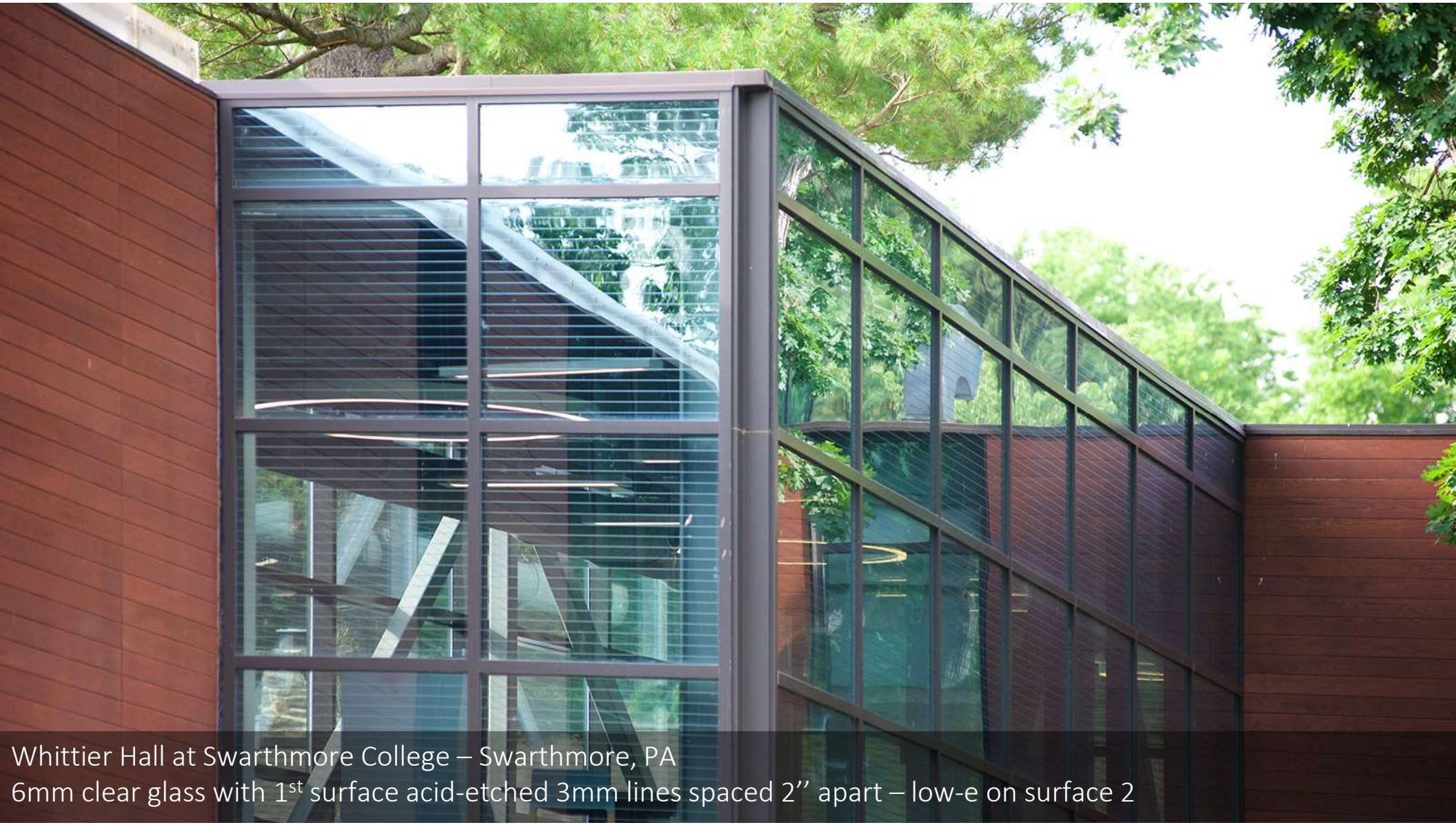
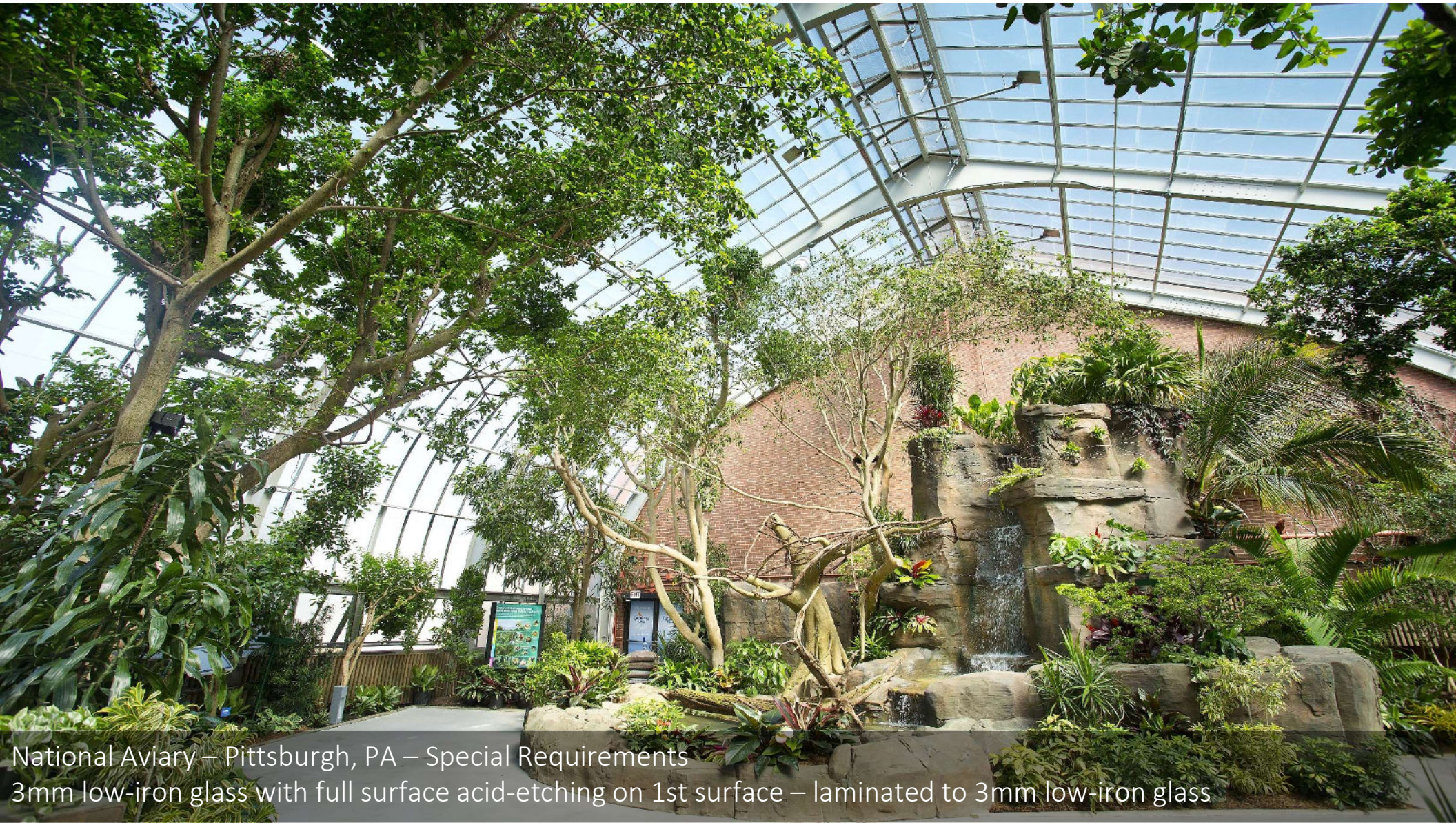


PPR Apartment at Swarthmore College – Swarthmore, PA
6mm clear glass with 1st surface acid-etched 3mm lines spaced 2’’ apart – low-e on surface 3

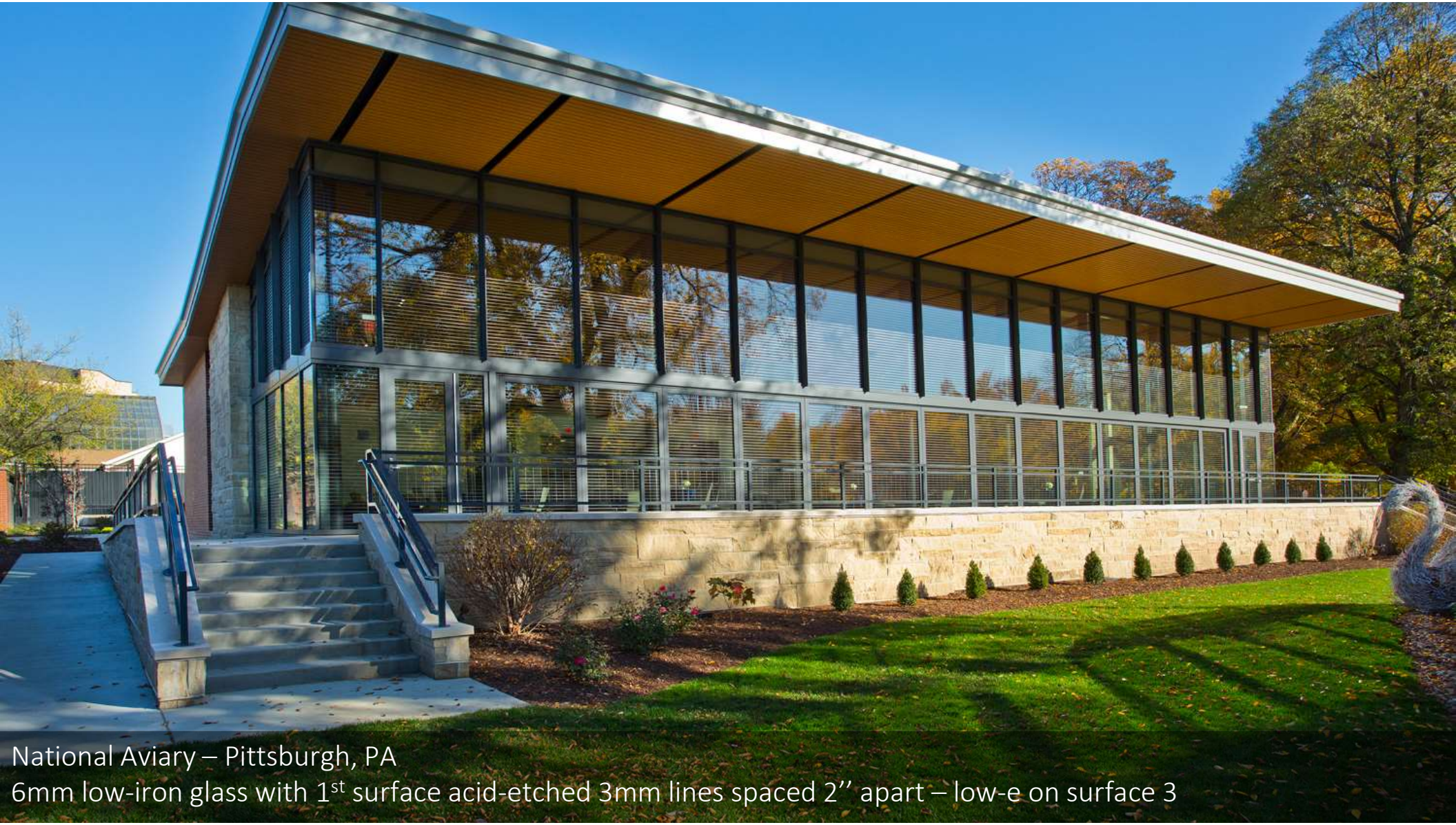


Whittier Hall at Swarthmore College – Swarthmore, PA
6mm clear glass with 1st surface acid-etched 3mm lines spaced 2’’ apart – low-e on surface 2

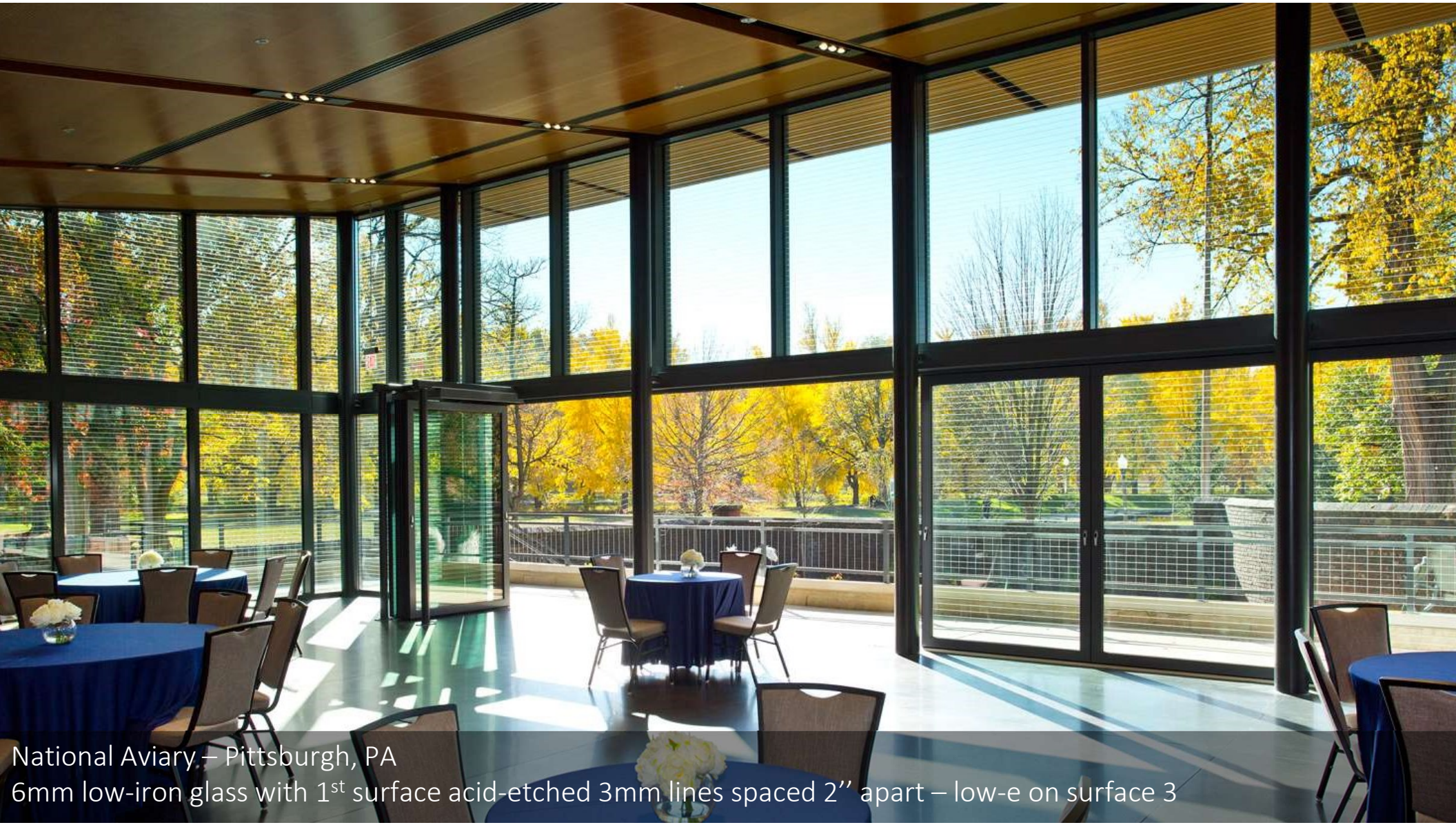
National Aviary – Pittsburgh, PA – Special Requirements
3mm low-iron glass with full surface acid-etching on 1st surface – laminated to 3mm low-iron glass



National Aviary – Pittsburgh, PA – Special Requirements
3mm low-iron glass with full surface acid-etching on 1st surface – laminated to 3mm low-iron glass

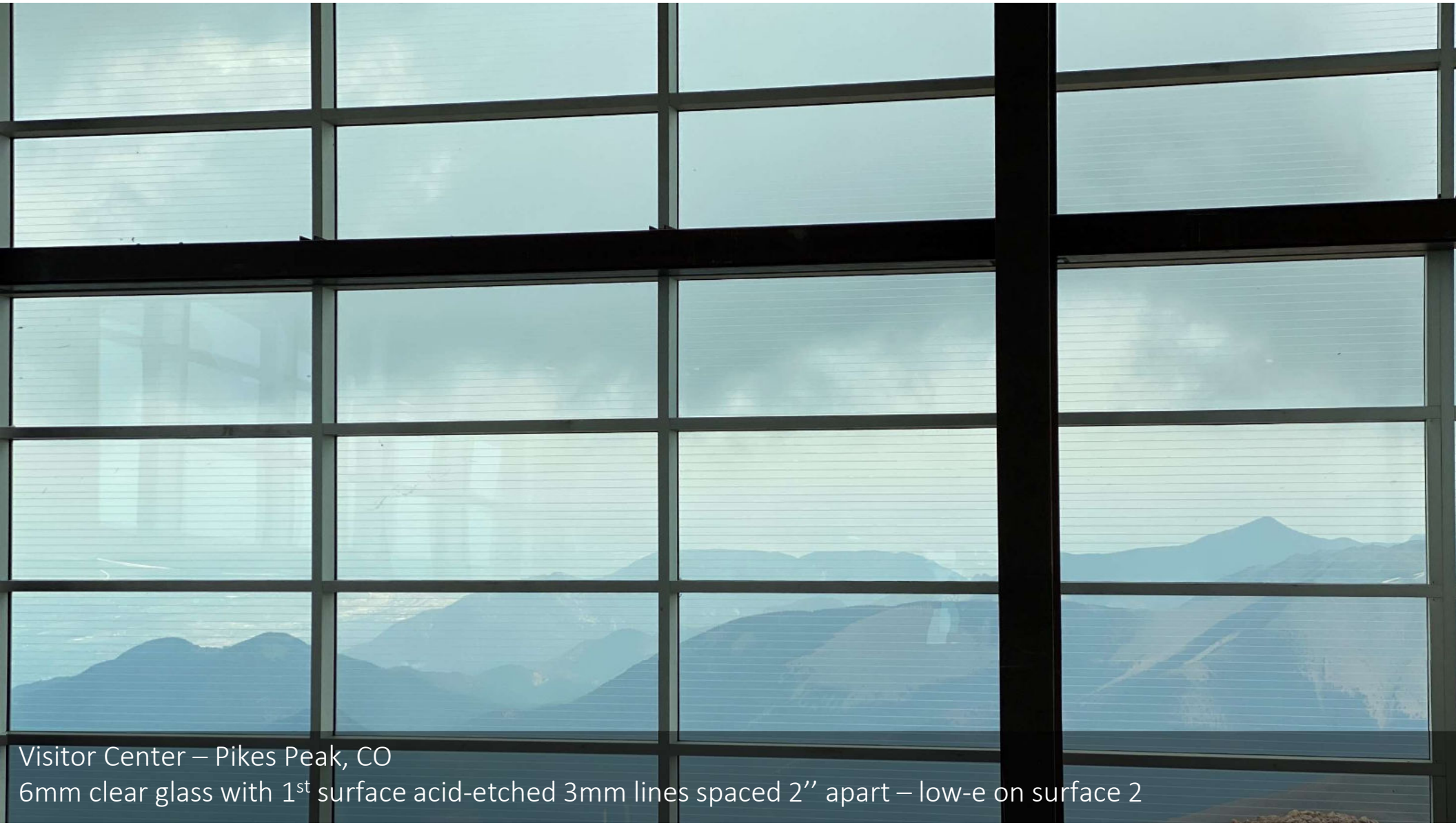


National Aviary – Pittsburgh, PA
6mm low-iron glass with 1st surface acid-etched 3mm lines spaced 2’’ apart – low-e on surface 3



National Aviary – Pittsburgh, PA
6mm low-iron glass with 1st surface acid-etched 3mm lines spaced 2’’ apart – low-e on surface 3

Visitor Center – Pikes Peak, CO
6mm clear glass with 1st surface acid-etched 3mm lines spaced 2’’ apart – low-e on surface 2



Visitor Center – Pikes Peak, CO
6mm clear glass with 1st surface acid-etched 3mm lines spaced 2’’ apart – low-e on surface 2

Berks Nature – Reading, PA
6mm clear glass with 1st surf MP0 acid-etched lines 2’’ – low-e coating on surface 2

Diapositive 63

MP0 Too many 213 projects in a row?
Marion Pynn; 2023-07-07T13:41:27.971

Berks Nature – Reading, PA
6mm clear glass with 1st surface acid-etched lines 2’’ – low-e coating on surface 2

Environmental Education and Resiliency Center – West Hempstead, NY
6mm Clear glass with organic pattern on surface 1 and low-e coating on surface 3

Environmental Education and Resiliency Center – West Hempstead, NY
6mm Clear glass with organic pattern on surface 1 and low-e coating on surface 3

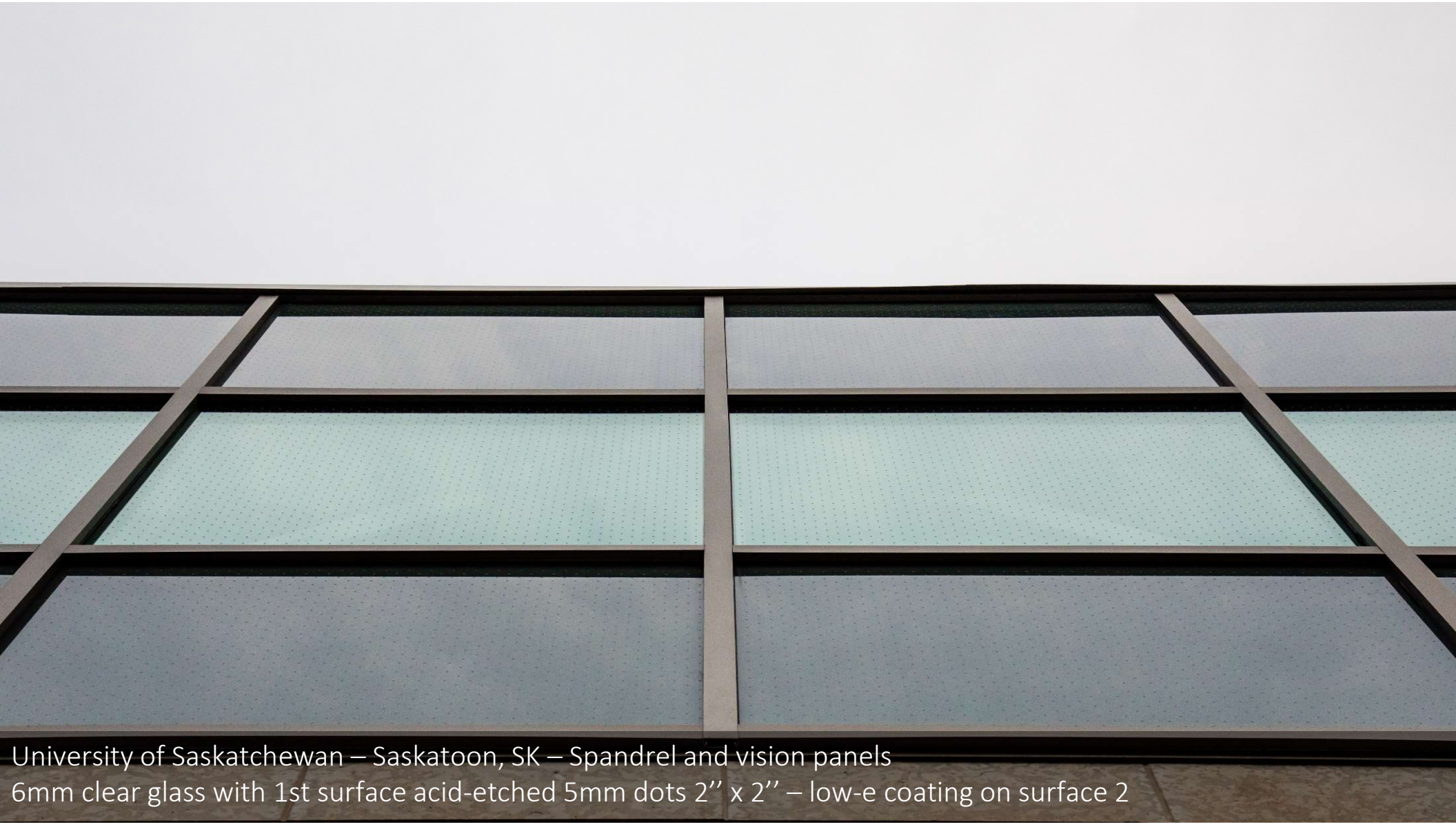
University of Minnesota Bee Research Center – Falcon Heights, MN
6mm clear glass with 1st surface 5mm dots 2’’ x 2’’ – low-e coating on surface 2

University of Minnesota Bee Research Center – Falcon Heights, MN
6mm clear glass with 1st surface 5mm dots 2’’ x 2’’ – low-e coating on surface 2

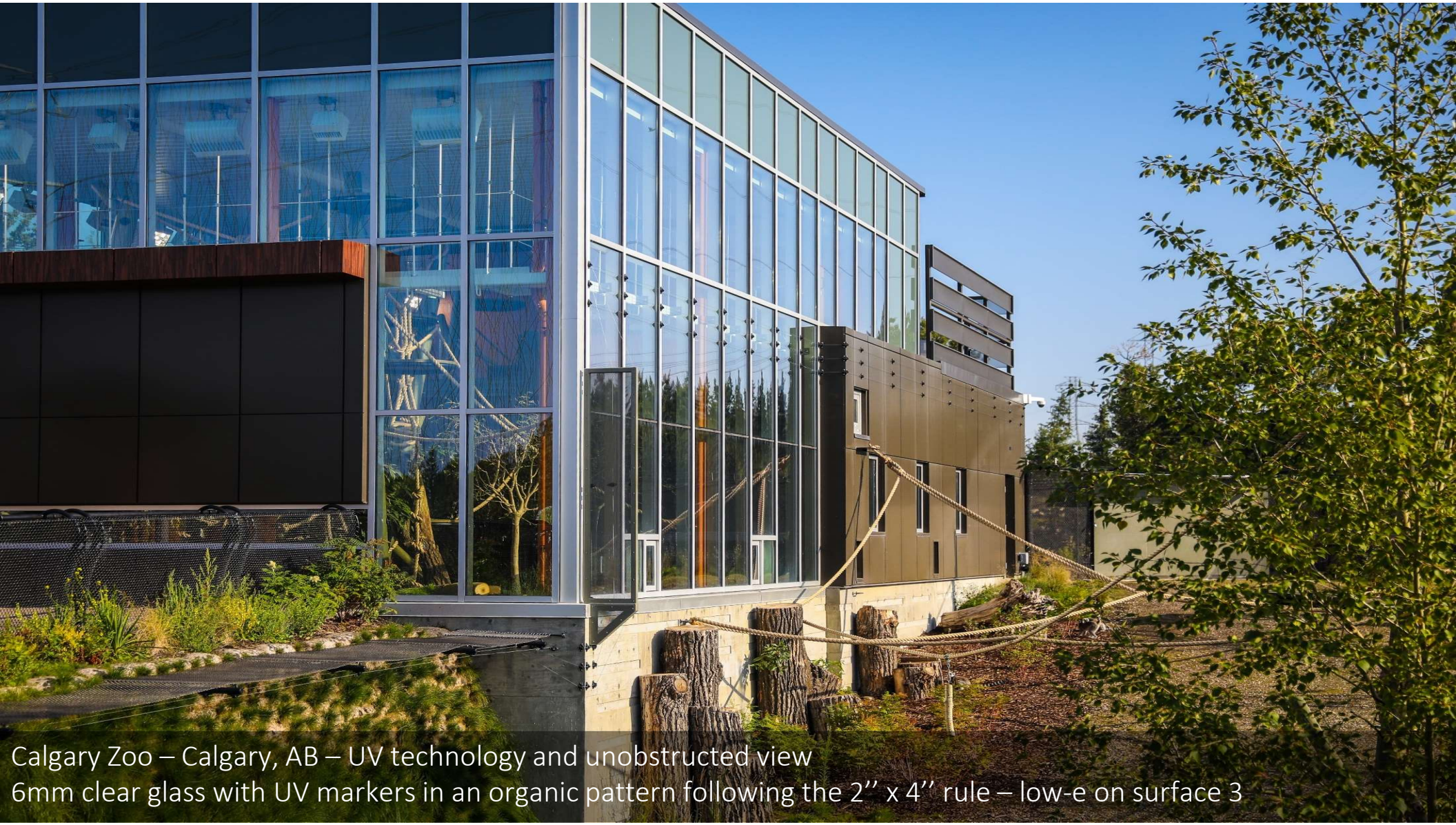
University of Saskatchewan – Saskatoon, SK – Spandrel and vision panels
6mm clear glass with 1st surface acid-etched 5mm dots MP0 x 2’’ – low-e coating on surface 2

Diapositive 69

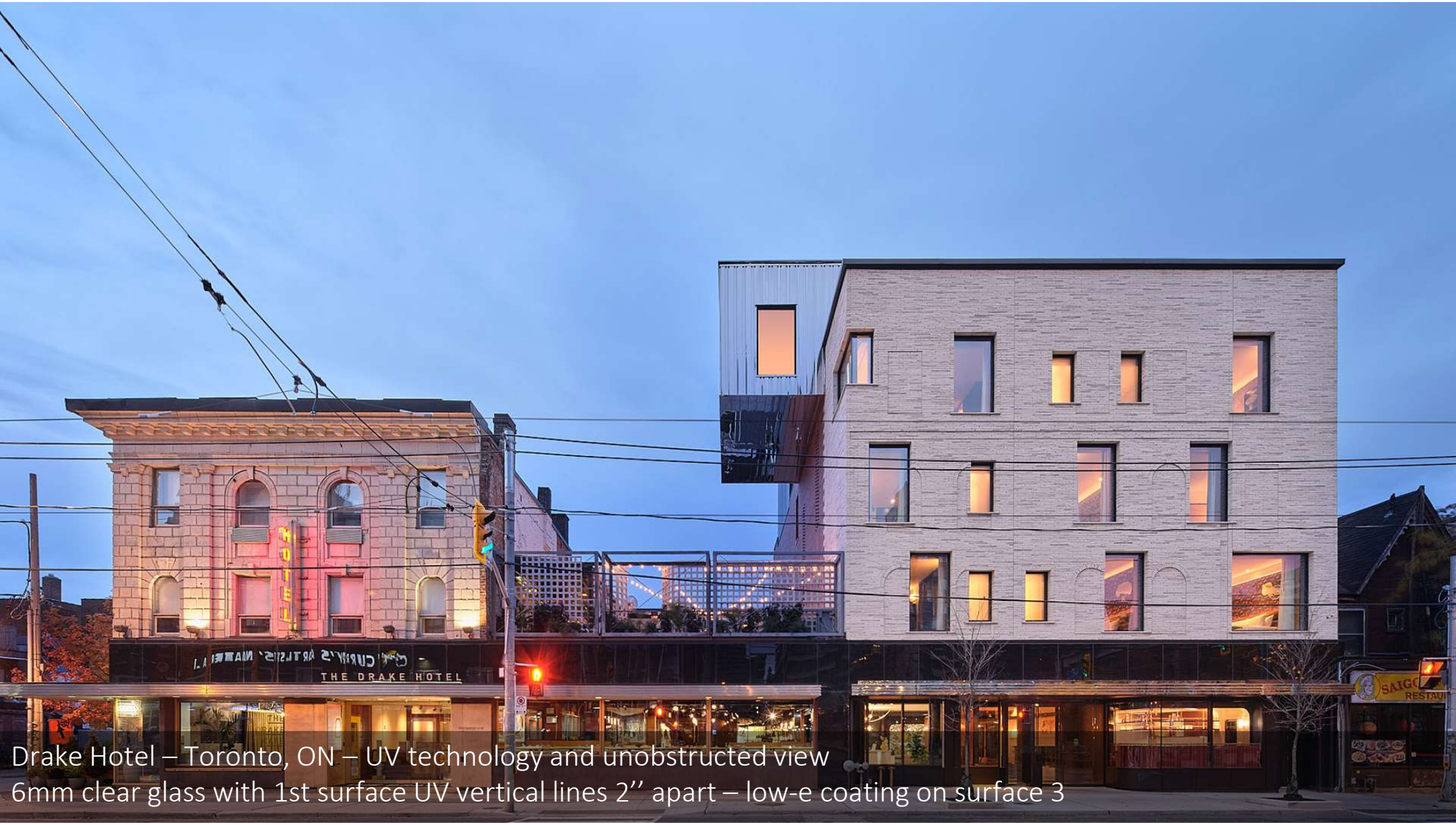
MP0 This building also uses AviProtek in the vision panes.
Marion Pynn; 2023-07-03T18:34:35.980



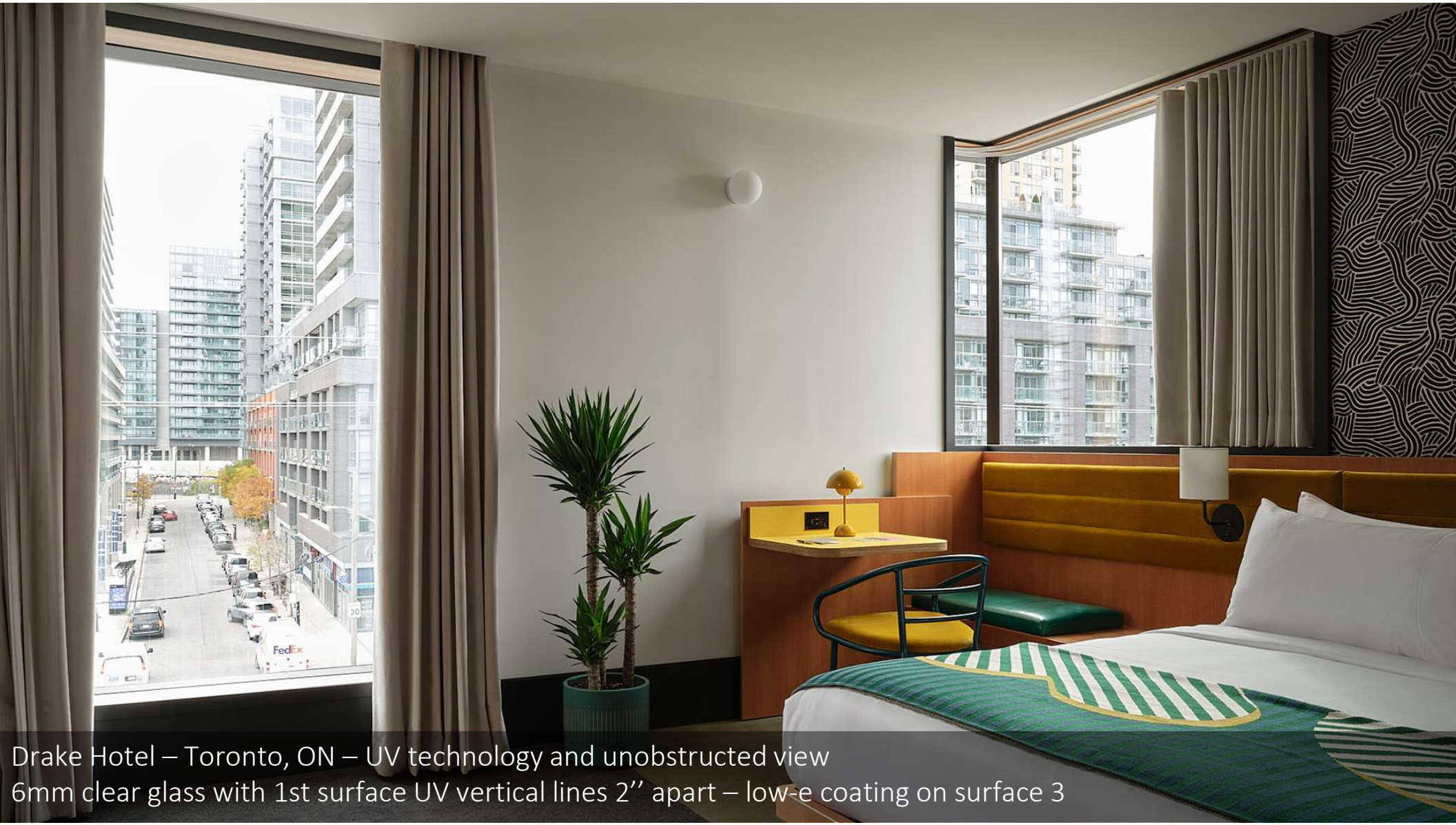
University of Saskatchewan – Saskatoon, SK – Spandrel and vision panels
6mm clear glass with 1st surface acid-etched 5mm dots 2’’ x 2’’ – low-e coating on surface 2



Calgary Zoo – Calgary, AB – UV technology and unobstructed view
6mm clear glass with UV markers in an organic pattern following the 2’’ x 4’’ rule – low-e on surface 3



Drake Hotel – Toronto, ON – UV technology and unobstructed view
6mm clear glass with 1st surface UV vertical lines 2’’ apart – low-e coating on surface 3



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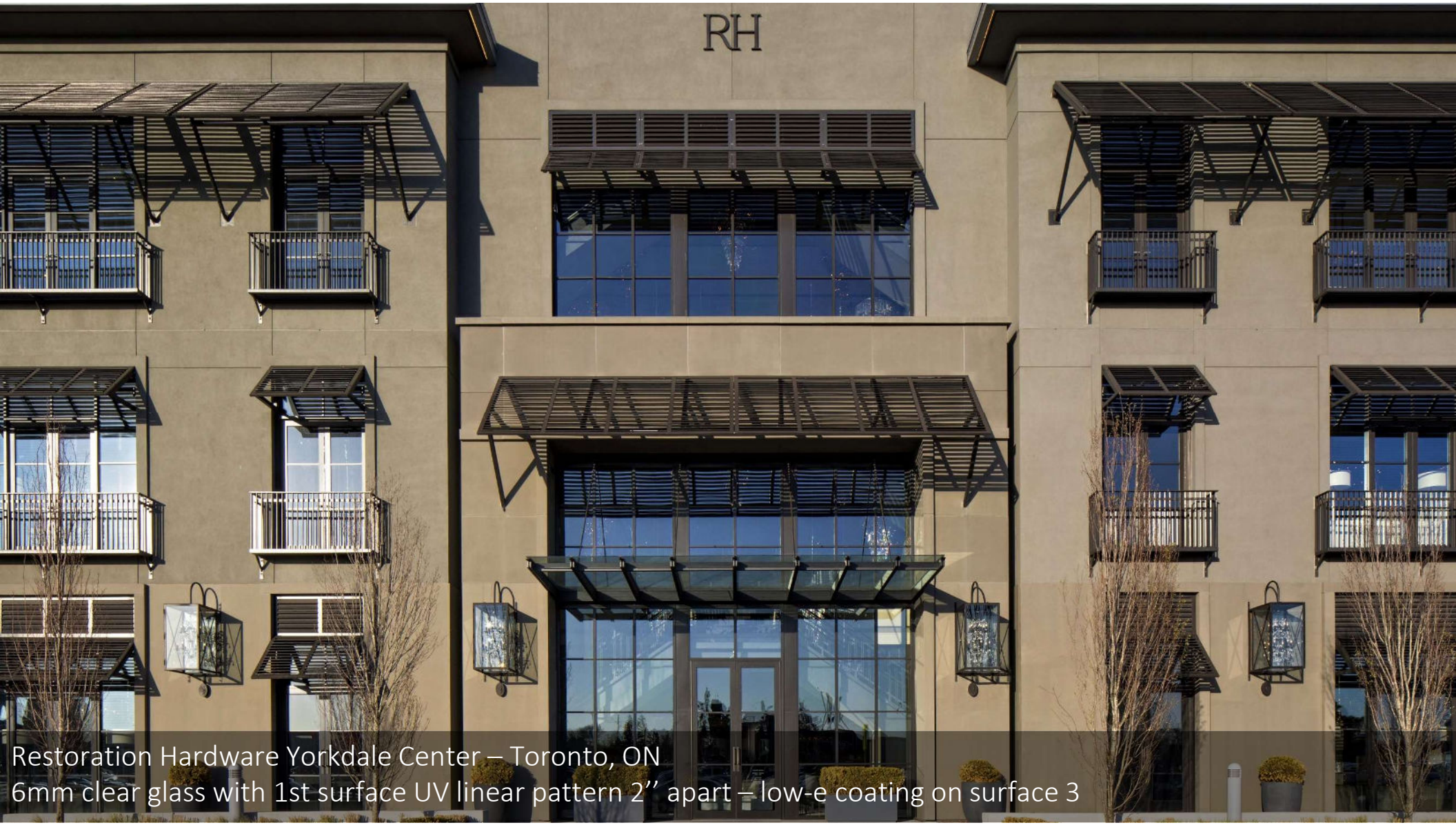
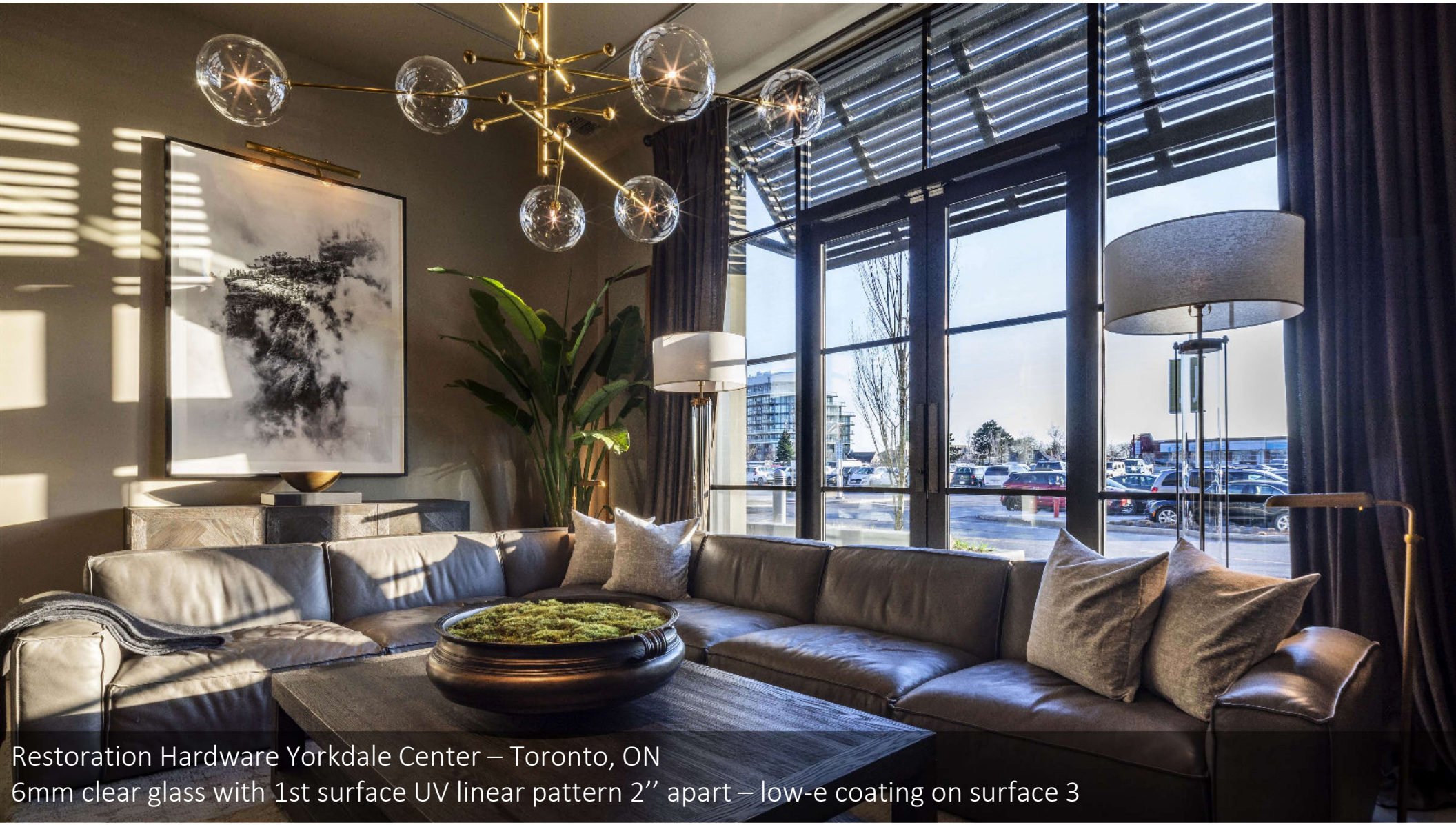
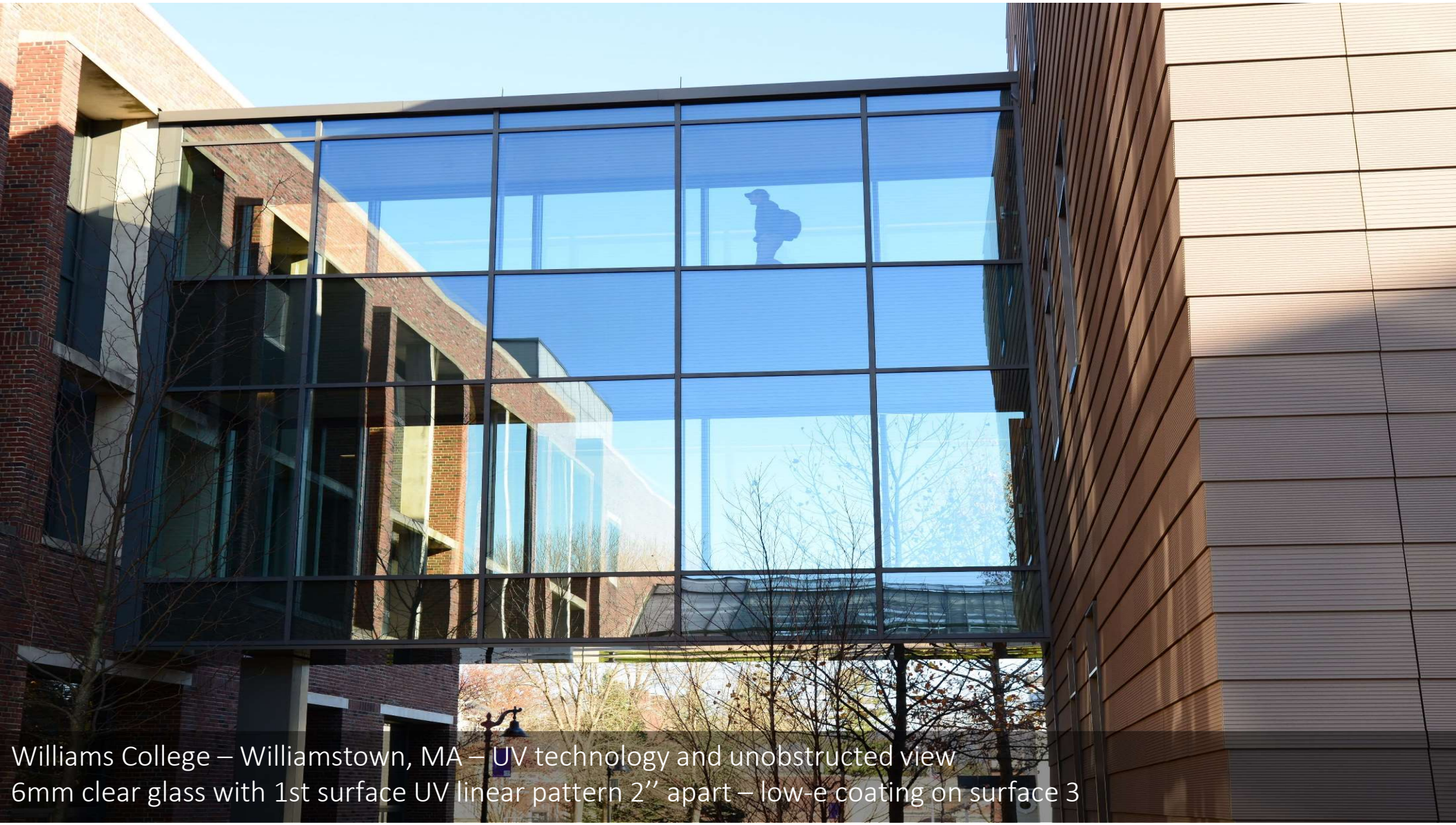


Restoration Hardware Yorkdale Center – Toronto, ON
6mm clear glass with 1st surface UV linear pattern 2’’ apart – low-e coating on surface 3



Restoration Hardware Yorkdale Center – Toronto, ON
6mm clear glass with 1st surface UV linear pattern 2’’ apart – low-e coating on surface 3



Williams College – Williamstown, MA – UV technology and unobstructed view
6mm clear glass with 1st surface UV linear pattern 2’’ apart – low-e coating on surface 3

Williams College – Williamstown, MA – UV technology and unobstructed view
6mm clear glass with 1st surface UV linear pattern 2’’ apart – low-e coating on surface 3

FUTURE EVOLUTION

- Expect the number of cities with bird deterrence legislation to rapidly increase in the next couple of years;
- NGA prescriptive guide to be rolled into an ASTM standard in a few years;
- Emphasis on treatments to the exterior surface of glass;
- Enhanced solutions combining daylighting, occupants' views to the exterior, and visual markers for birds;
- Migration from voluntary guidelines to mandatory standards.

Yellow-rumped Warbler

Peregrine Falcon

RECAP

- Birds are an important part of our biodiversity.
- Collisions with glass are killing birds at unprecedented levels.
- Testing has shown that markers meeting the “2 x 4” rule are effective at reducing bird strikes.
- Available options include films, frits, UV products and acid-etching.
- First surface solutions are better for birds, as it helps them identify glass as a solid barrier.

RESOURCES

- New York City Audubon Society - http://www.nycaudubon.org
- CSA A460 – Bird-friendly building design- https://webstore.ansi.org/
- National Audubon Society - http://www.audubon.org/
- Cornell Lab of Ornithology - http://www.birds.cornell.edu/
- American Bird Conservancy – http://www.abcbirds.org/ and http://www.birdsmartglass.org/
- Fatal Light Awareness Program (FLAP) - http://www.flap.org/

RESOURCES

- Muhlenberg College - Department of Biology - Acopian Center for Ornithology – http://www.muhlenberg.edu/main/academics/biology/faculty/klem/aco/
- US Green Building Council (USGBC) Pilot credit 55 - Bird Collision Deterrence – http://www.usgbc.org/credits/core-shell-existing-buildings-healthcare-new-construction-retail-nc-schools/v2009/pc55
- Bird Life International – http://www.birdlife.org/

This concludes The American Institute of Architects Continuing Education Systems Course

Walker Glass Company Ltd
9551 Ray Lawson Blvd., Montreal, Quebec H1J 1L5
Canada T. 888-320-3030

To access the e-books

The AviProtek® e-books of bird-friendly glass are available for download from **walkerglass.com**
Ask your architectural manager for a link to download the document for your region. Wherever you're working, we've got you covered with an e-book for your region.

WALKER

Walker Textures®
Acid-etched Glass & Mirror

AviProtek®
Bird Safe Glass

Walker Textures®
Specialties

Sustainable Materials
EPD / HPD®

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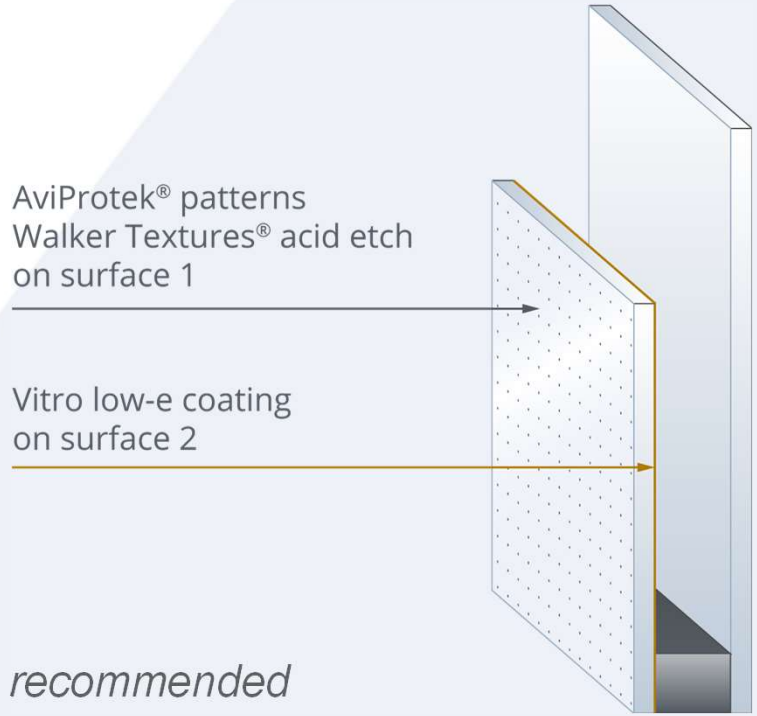
AviProtek – 1 Challenge 3 Solutions

- AviProtek
  - AviProtek® is Walker's bird friendly glass solution with the acid-etched designs on the number 1 surface of the glass.
- AviProtek E
  - The AviProtek® E bird friendly glass solution combines acid-etched visual markers on the 1st surface with Vitro's Solarban® high performance low-e on the 2nd surface
- AviProtek T
  - AviProtek T is a highly effective yet discrete bird friendly glass solution using Pilkington NA's pyrolytic coated glass.
- Dimensions : standard 96" x 130" – 72''x130'' & 84'' x 130'' available on demand - ¾" to 1" unusable trim
- All AviProtek products have their visual markers on the 1st surface
- All AviProtek products are warrant for a 10 year period

AviProtek E - Product specifications

Acid-etched Visual Markers on #1 with the Low-e High Performance Solarban® Coatings on #2

- Most Solarban coatings available
  - Solarban 60
  - Solarban 67
  - Solarban 70
  - Solarban 72
  - Solarban 90



R100 or coatings with similar reflection level are not recommended

AviProtek & AviProtek T - Product specifications

Visual Markers on #1 with Low-e on surface #3

- Aviprotek or full surface (Velour, Opaque or Satin) on #1 with any domestic Low-E on #3

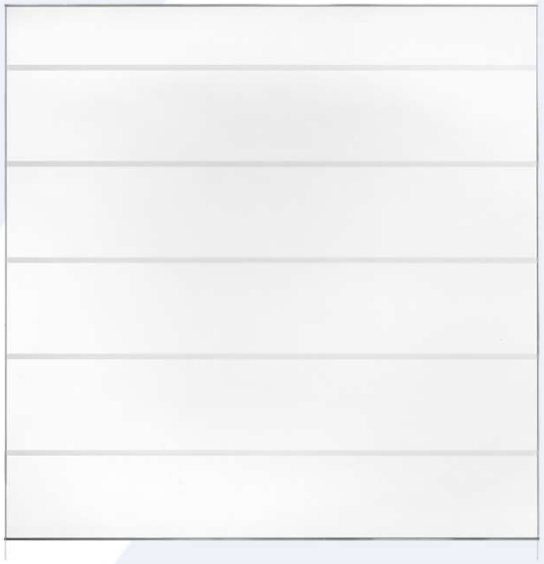
- Aviprotek T
    - Range of UV transparent patterns on surface #1
    - Made from Pilkington's pyrolytic coated glass
    - 3.2 mm, 6mm clear
    - 6mm Optiwhite
    - 96" x 130"
    - Minimum 1 pack

Visual Markers Available

211

Vertical

213



Horizontal

214

Organic

Visual Markers Available

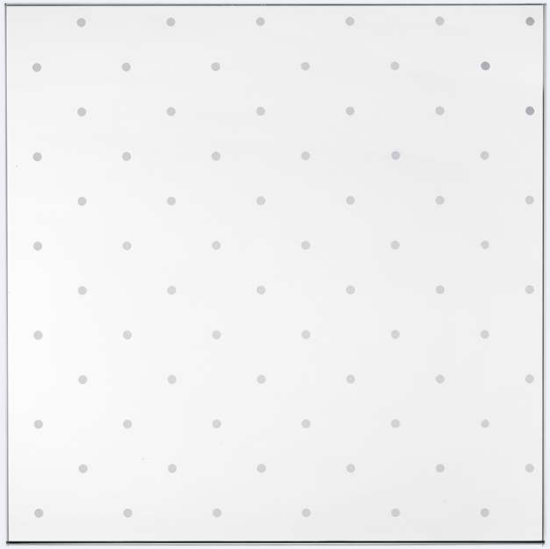
215

2” X 2” – 5MM Dots

216

4” X 4” – 6MM Dots

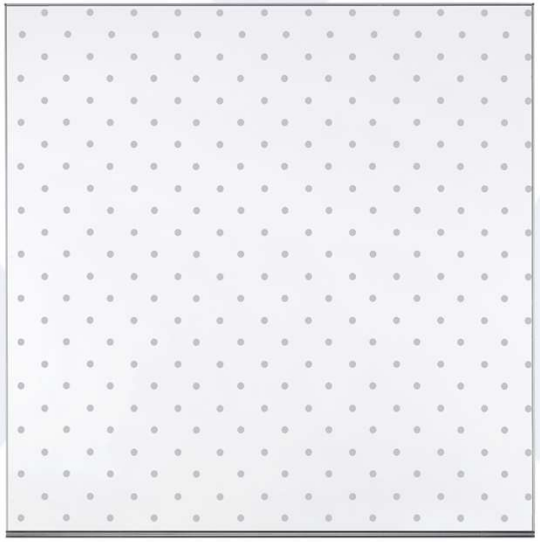
217



2” X 2” – 5MM Dots

Visual Markers Available

219

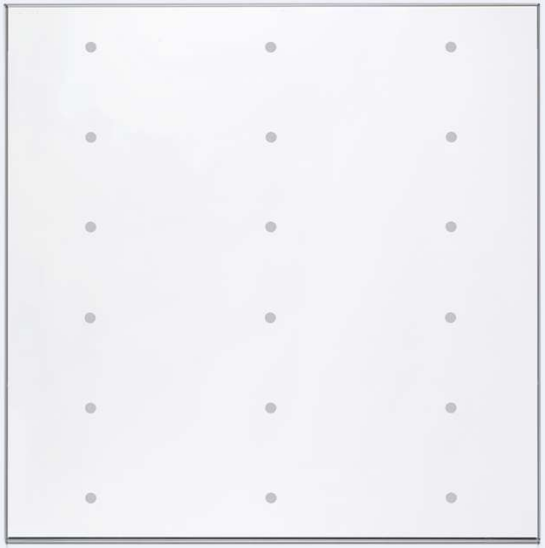


1” X 1” – 4MM Dots

220

4” X 4” – 6MM Dots

221



2” X 4” – 5MM Dots

Visual Markers

Non-directional patterns

226

2’’ x 2’’ – 5MM Squares

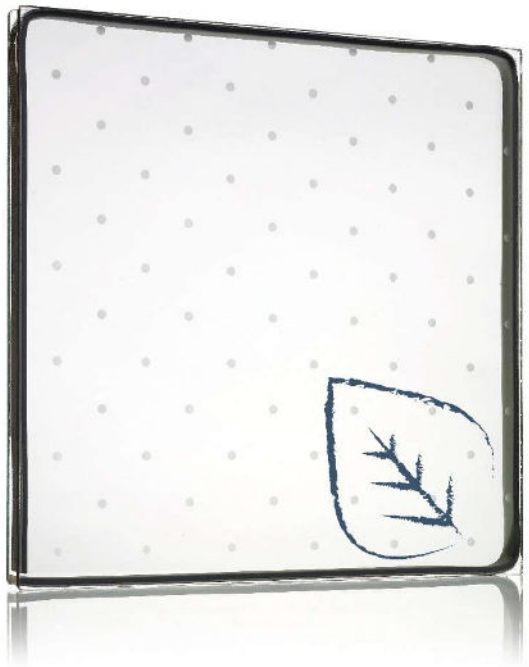
227

2’’ x 4’’ – 5MM Squares

LEED® v4.1 Credits Available with Walker Glass Products

Category	Credit name	Option	Credits available
Energy and Atmosphere	Optimize Energy Performance	Option 1. Energy Performance Compliance	18
Materials and Resources	Environmental Product Declarations	Option 1. Environmental Product Declaration (EPD)	1
	Material Ingredients	Option 1. Material Ingredient Reporting	1
Indoor Environmental Quality	Low-Emitting Materials	n/a	3
	Thermal Comfort	n/a	1
	Daylight	Option 1. Simulation: Spatial Daylight Autonomy and Annual Sunlight Exposure	3 (2 for Healthcare)
		Option 2. Simulation: Illuminance Calculations	
		Option 3. Measurement	
	Quality Views	n/a	1
Innovation	Innovation	Option 1. Innovation	1
		Option 2. Pilot: Bird Collision Deterrence	1
		Option 3. Additional Strategies	3

Sustainable Materials



EPD – Environmental Product Declaration

Bird Friendly Glass

Acid-etched Glass

Acid-etched & Un-etched Mirror

Patterned Acid-etched Glass

HPD® – Health Product Declaration®

Acid-etched Glass

Acid-etched Mirror

Acid-etched Patterns & Bird Friendly Glass

Warranty on Surface Degradation

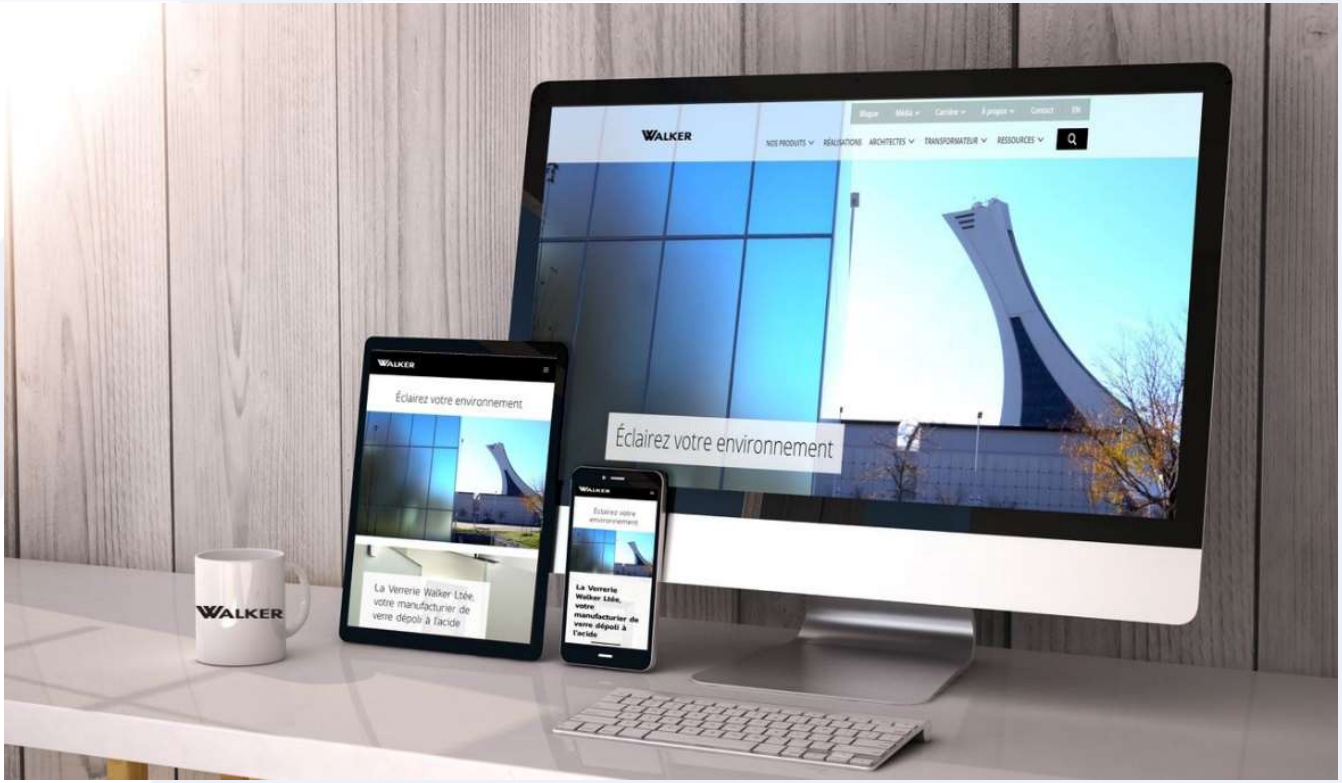
Walker warrants, for a period of 10 years, that the AviProtek® surface will not degrade, provided that the surface is not subjected to any conditions that would otherwise lead to premature degradation of unetched float glass.

Support

- Samples: architectural kit, 12x12, full size
- Architectural managers
- Literature, specifications, performance data available
- Marketing alliance with Vitro Architectural Glass and Pilkington

Online Resources

- Website
- Monthly Newsletter
- Social Media
- Blogs and Videos



www.walkerglass.com

Thank You!

WALKER

AviProtek™

Bird Friendly Acid-etched Glass

www.walkerglass.com