BIRD FRIENDLY DESIGN

Architectural Design that Saves Birds' Lives

MARCH 13 • 6 PM

District Architecture Center

DEPARTMENT OF ENERGY & ENVIRONMENT

AIA | DC

AMERICAN BIRD CONSERVANCY

CITY WILD LIFE

AGENDA

6:00 pm
Mary Lynn Wilhere, Urban Sustainability Administration, Department of Energy and Environment (DOEE)

6:05 pm
Tommy Wells, Director, Department of Energy and Environment (DOEE)

6:15 pm
Claire Cahan, Studio Design Director, Studio Gang, Chicago, IL -- "Building Habitat“

6:45 pm
Dan Piselli, Senior Associate, FxCollaborative Architects, LLP, New York, NY -- "Examples from NYC“

7:15 pm
Christine Sheppard, Ph.D., Director, Glass Collisions Program, American Bird Conservancy -- "The Nuts and Bolts of Bird Collisions“

7:35 pm
Anne Lewis, President, City Wildlife

DEPARTMENT OF ENERGY & ENVIRONMENT

Bird-Friendly Design in DC:

Architectural Design that Saves Birds' Lives

Examples from NYC

Daniel Piselli AIA, LEED, CPHD

FXCollaborative

March 13, 2018

CASE STUDIES


The Javits Center Renovation


Statue of Liberty Museum


Center for Global Conservation


Columbia University School of Nursing


Columbia University Business School


New York Times Building

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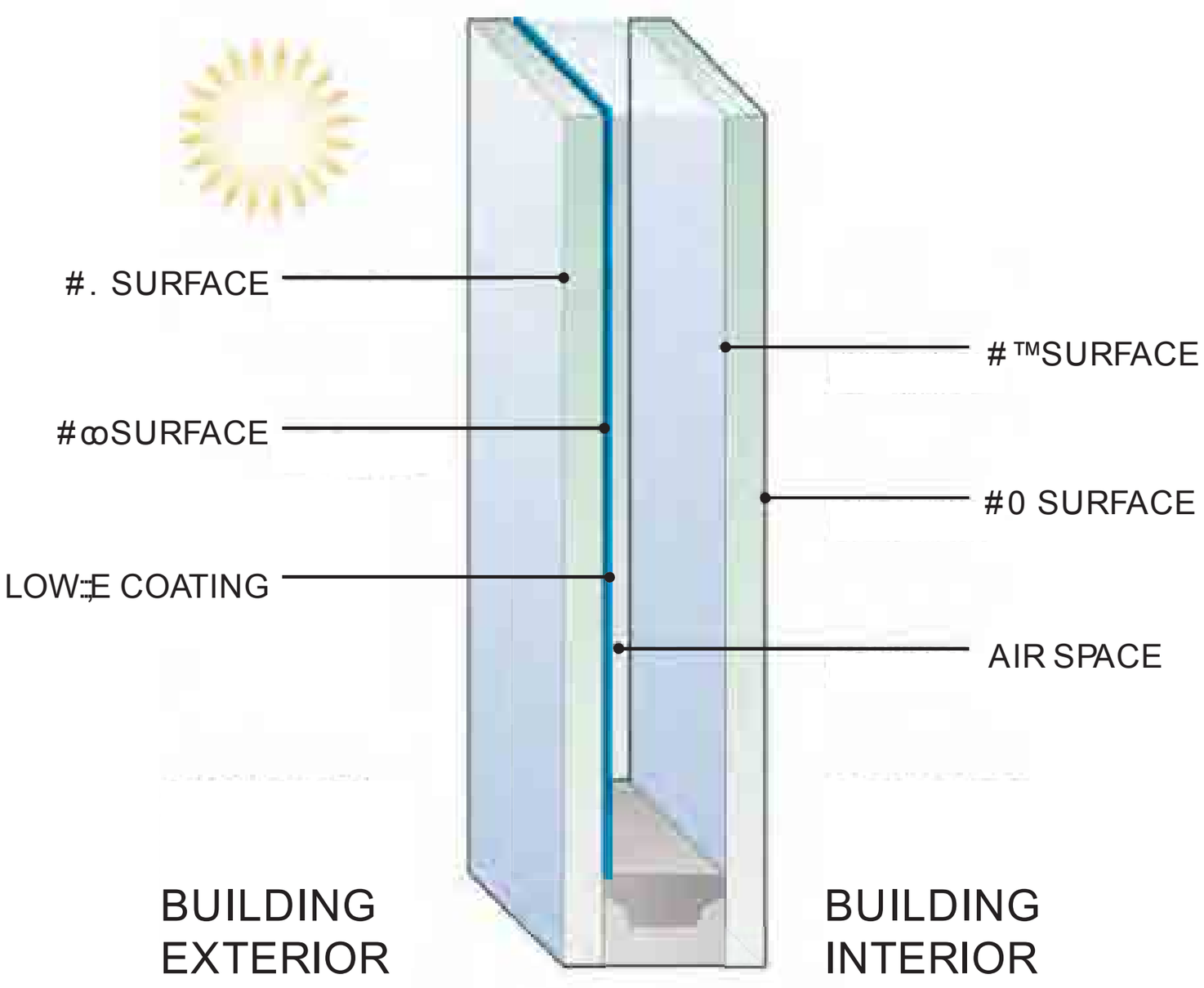
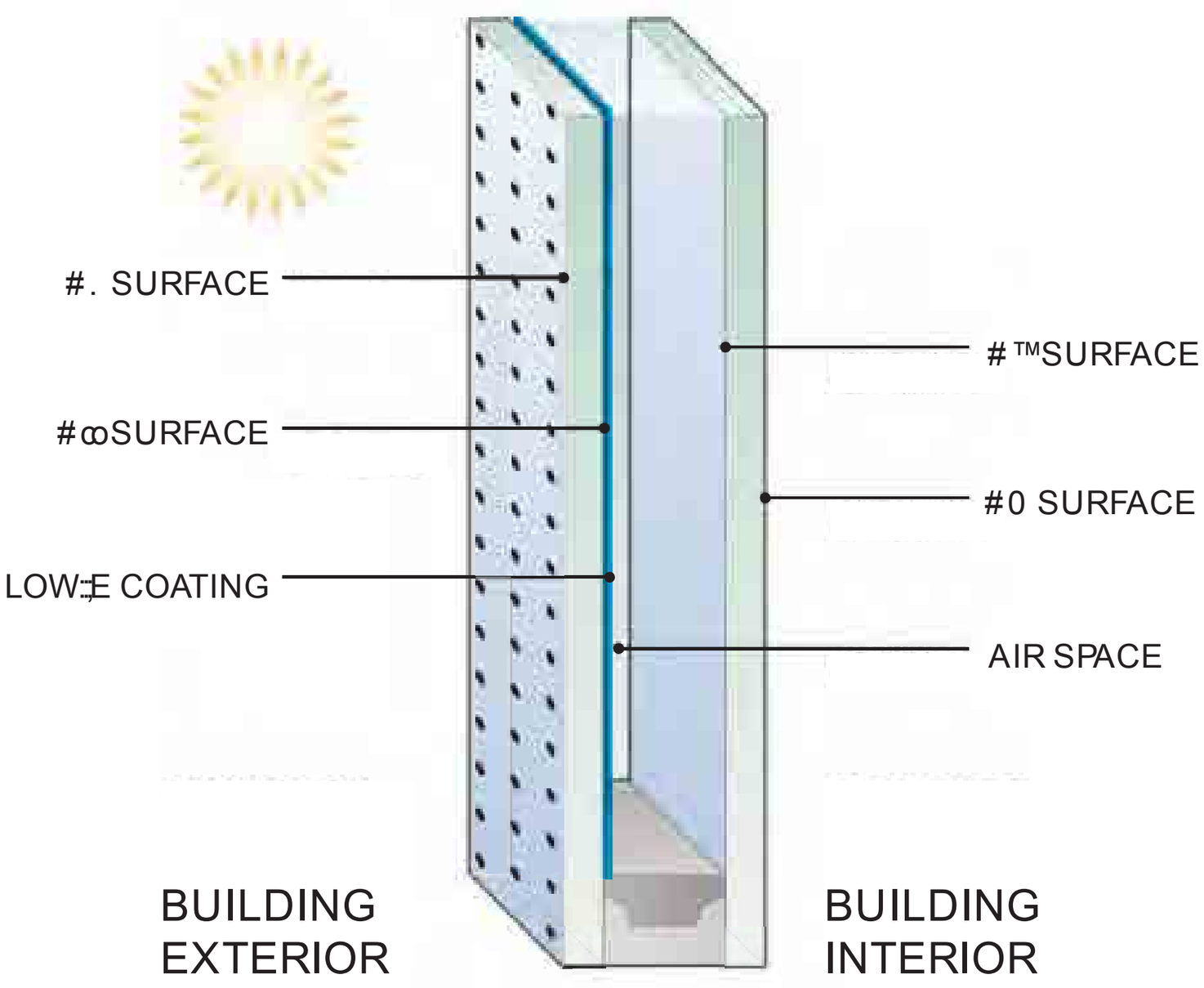
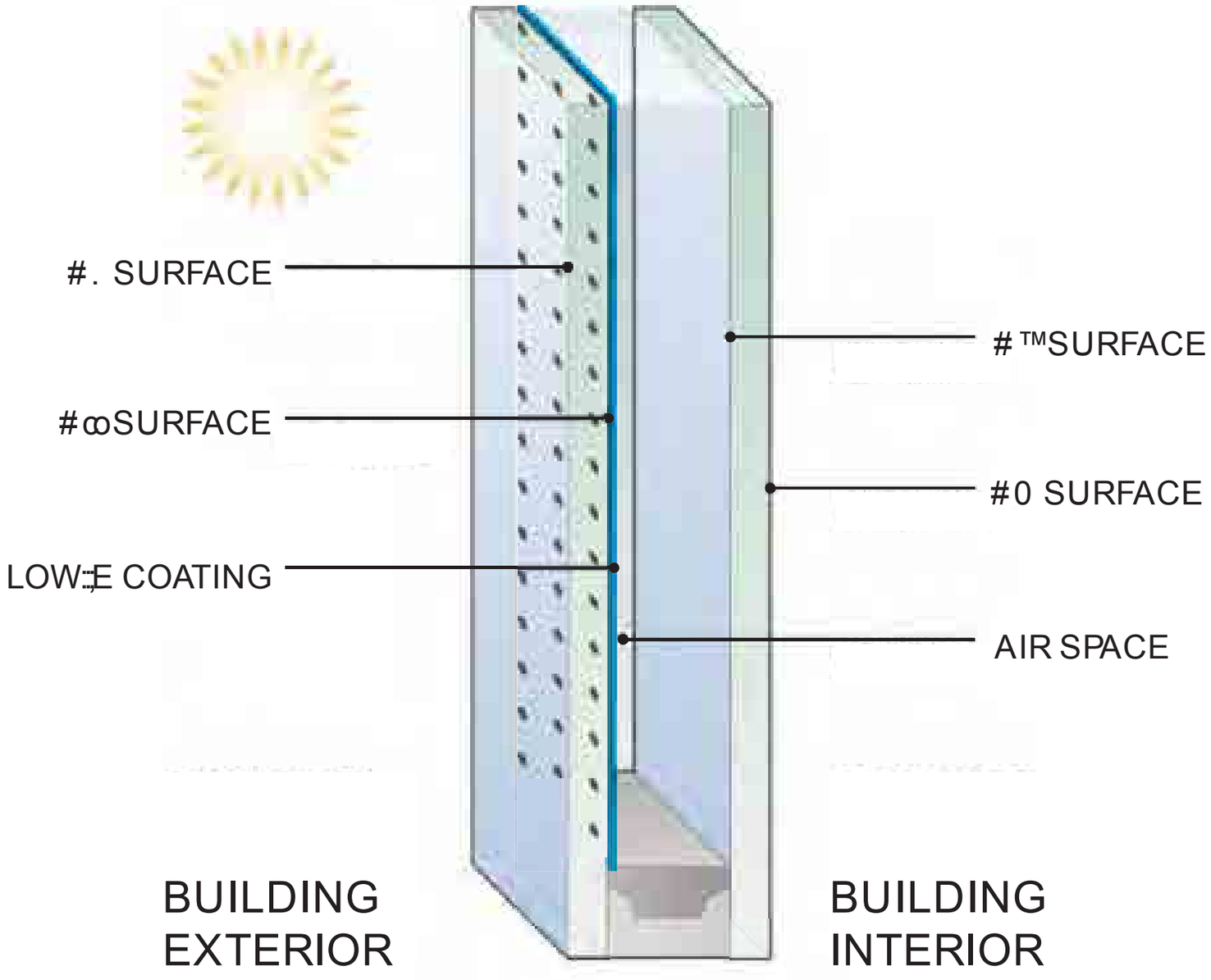
INSULATING GLASS



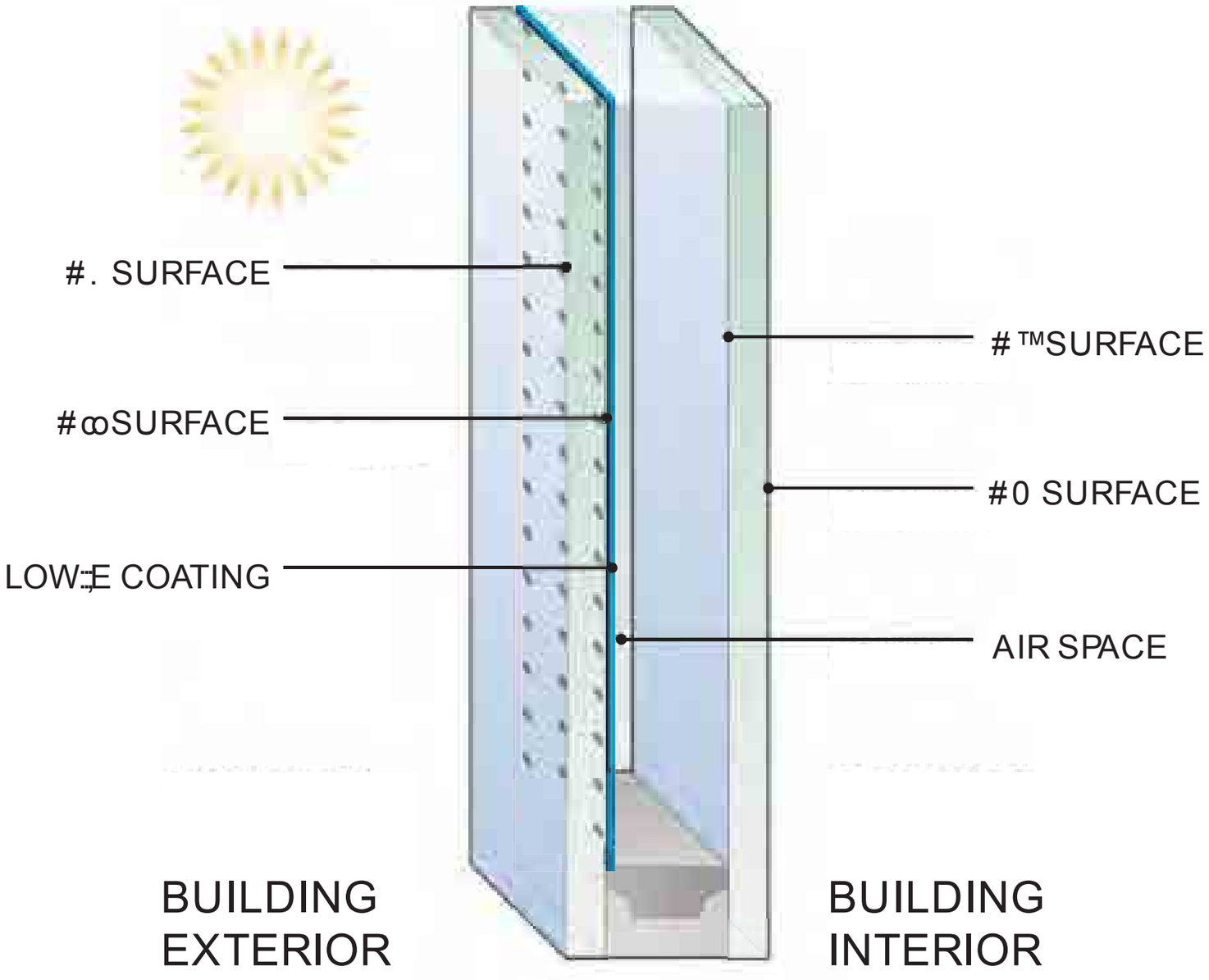
INSULATING GLASS: Frit on #1 Surface



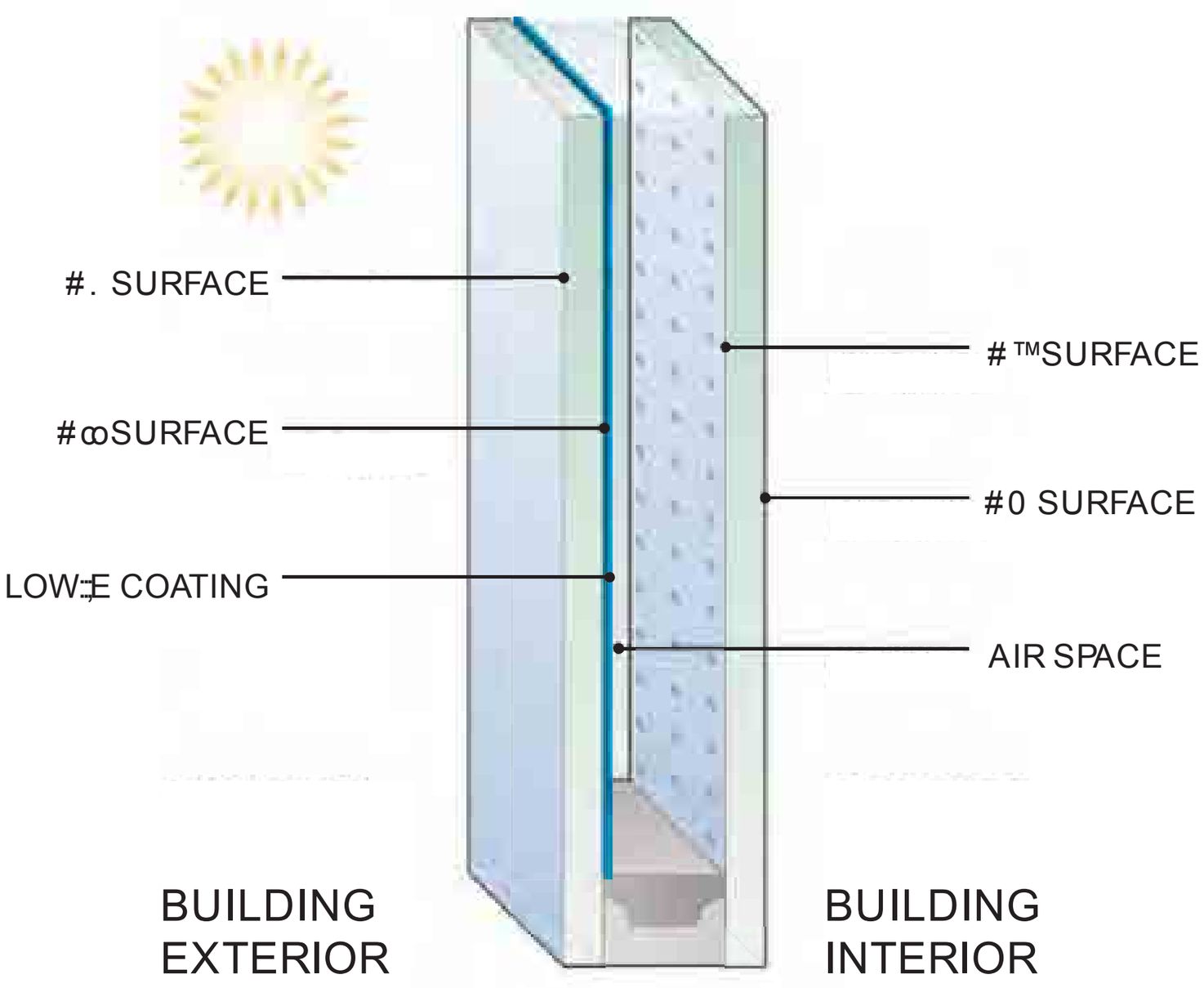
INSULATING GLASS: Frit on #2 Surface External to Coating



INSULATING GLASS: Frit on #2 Surface Internal to Coating



INSULATING GLASS: Frit on #3 Surface



CENTER FOR GLOBAL CONSERVATION

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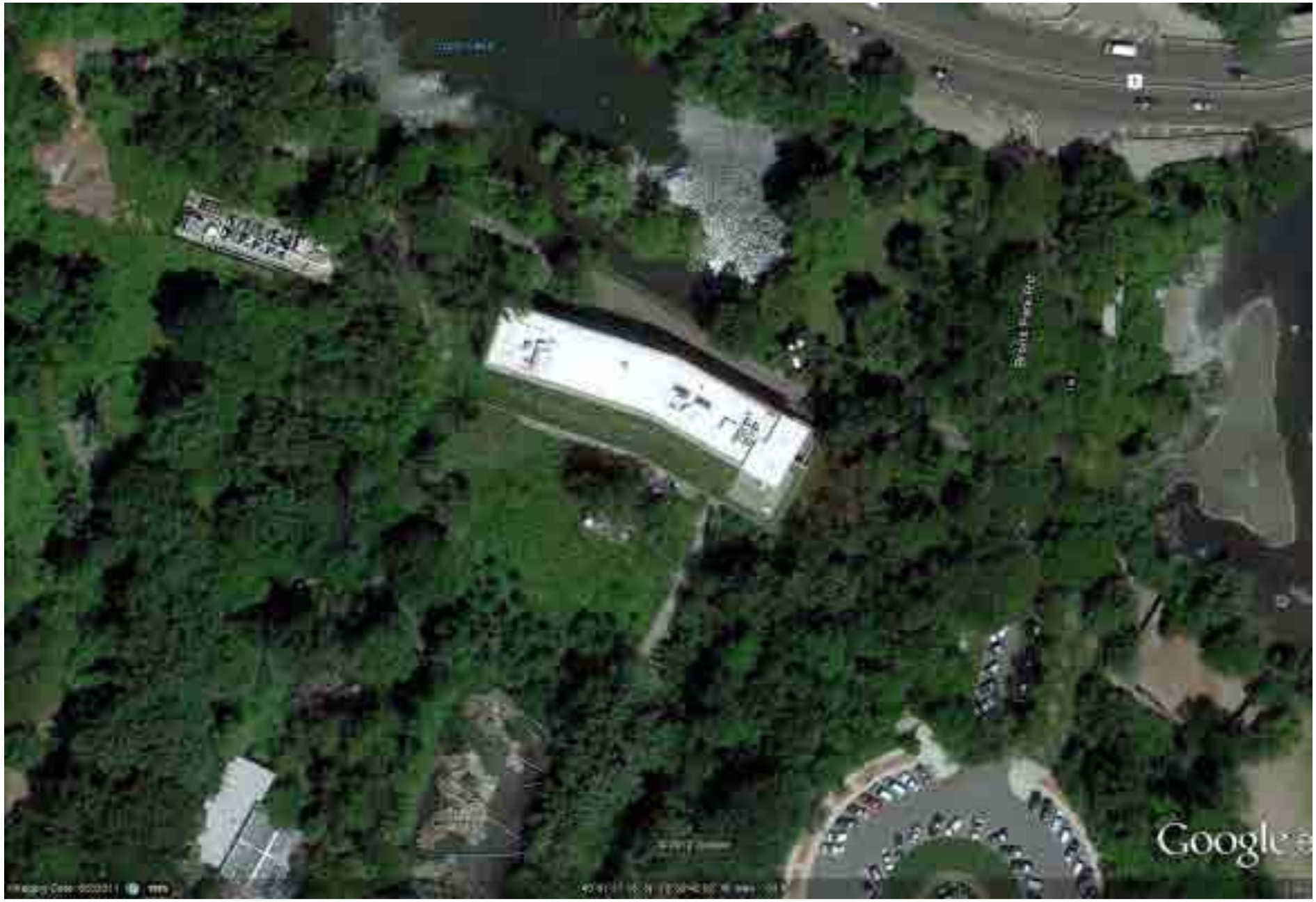


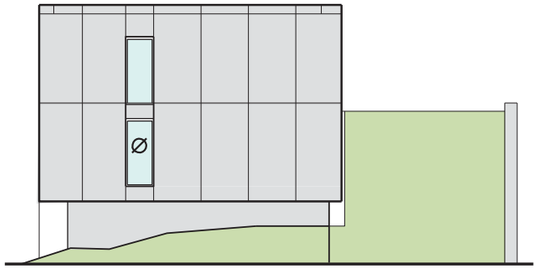
CENTER FOR GLOBAL CONSERVATION: UV Reflective Pattern

CENTER FOR GLOBAL CONSERVATION: Strategies & Monitoring - North Facade

[3RD LEVEL]
[2ND LEVEL] &
[1ST LEVEL] *

SYMBOLS:
- Hit prior to 5/29/09, killed
- Hit prior to 5/29/09, flew away
- Hit after 5/29/09, killed
- Hit after 5/29/09, flew away

CENTER FOR GLOBAL CONSERVATION: Strategies & Monitoring - West Facade



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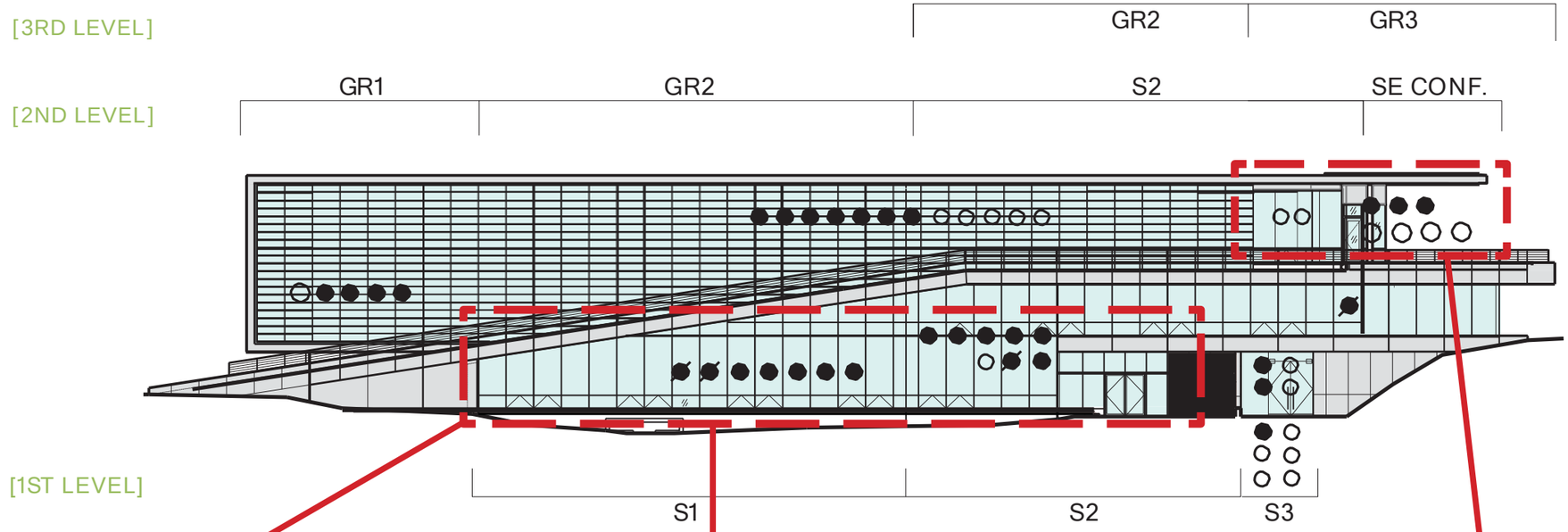
CENTER FOR GLOBAL CONSERVATION: Strategies & Monitoring - South Facade



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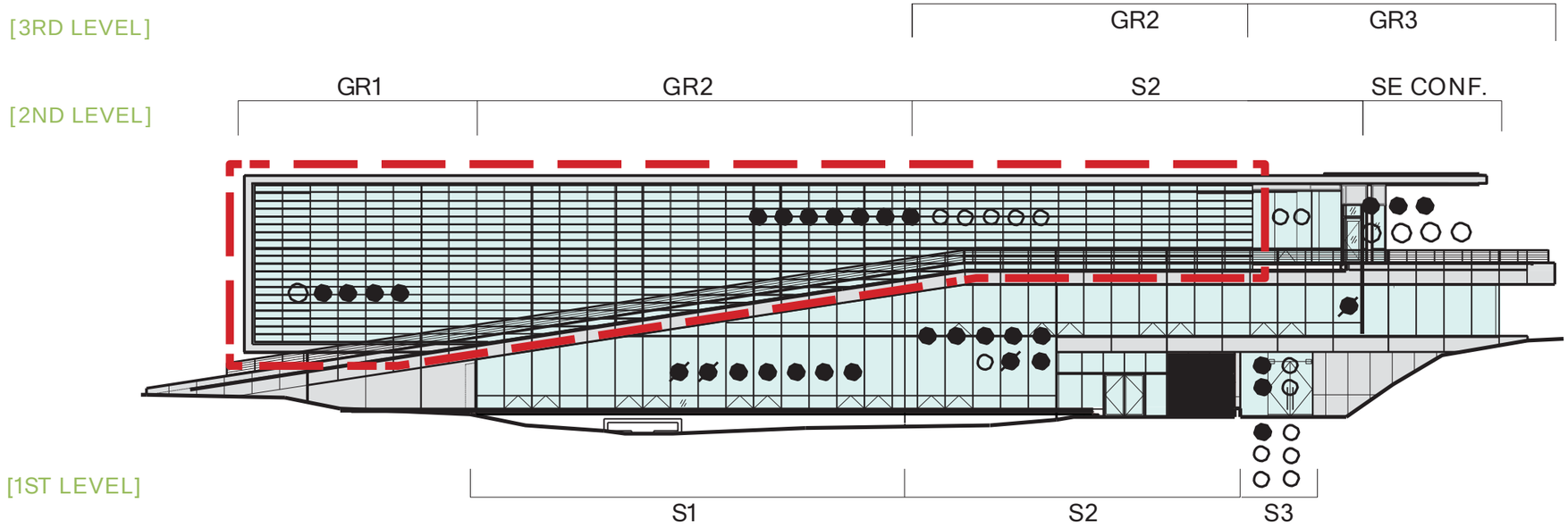

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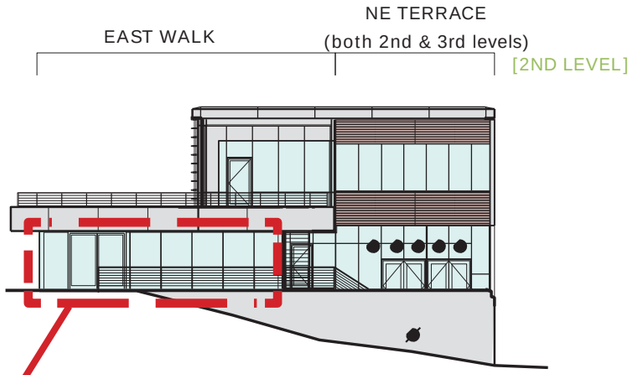
- Hit after 5/29/09, flew away

CENTER FOR GLOBAL CONSERVATION: Strategies & Monitoring - East Facade



SYMBOLS:

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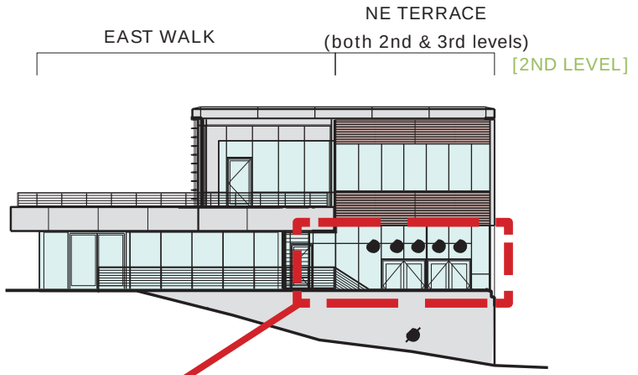
- Hit after 5/29/09, killed
- Hit after 5/29/09, flew away

CENTER FOR GLOBAL CONSERVATION: Strategies & Monitoring - East Facade



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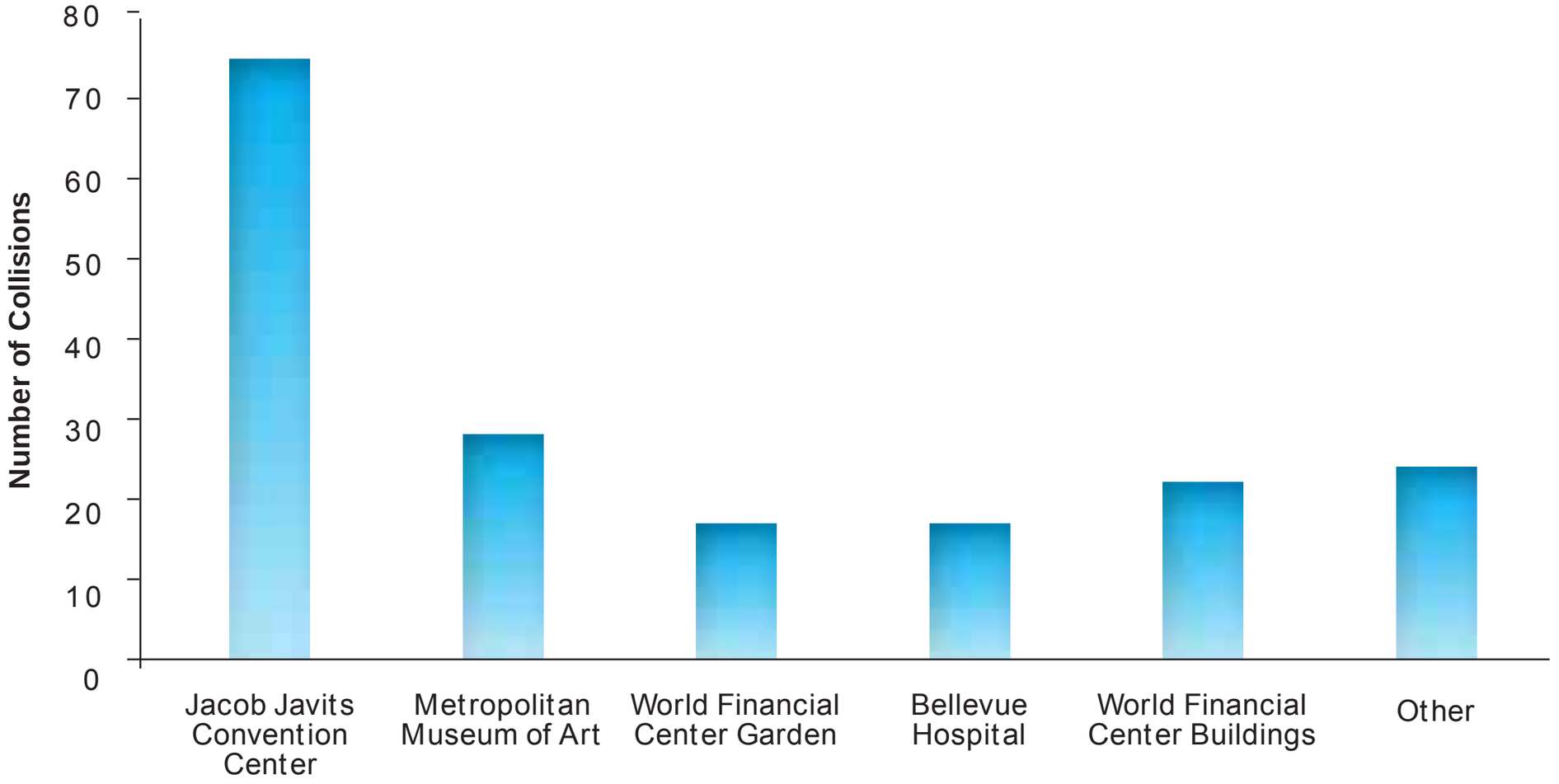
JAVITS CENTER RENOVATION

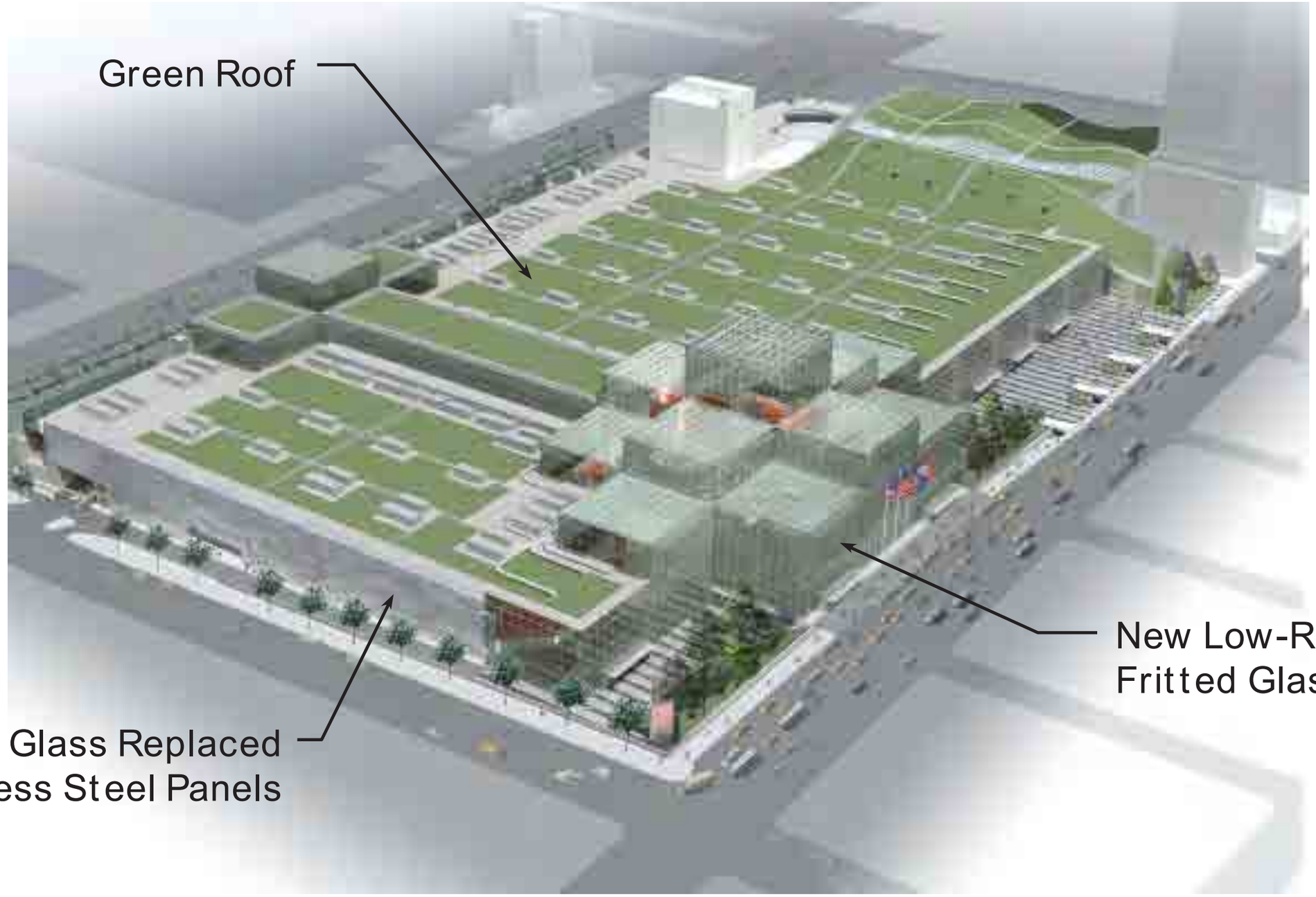
JAVITS CENTER RENOVATION: Pre-Existing Façade Condition

JAVITS CENTER RENOVATION: Bird Collision Location and Frequency - Fall 2007



Source: Project Safe Flight - New York City Audubon

JAVITS CENTER RENOVATION: Overview



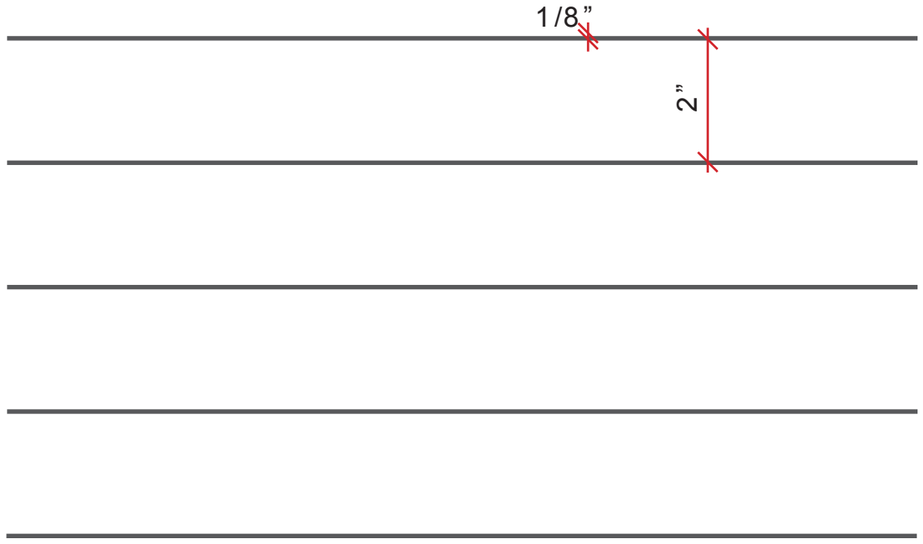
JAVITS CENTER RENOVATION: Green Roof, Urban Habitat

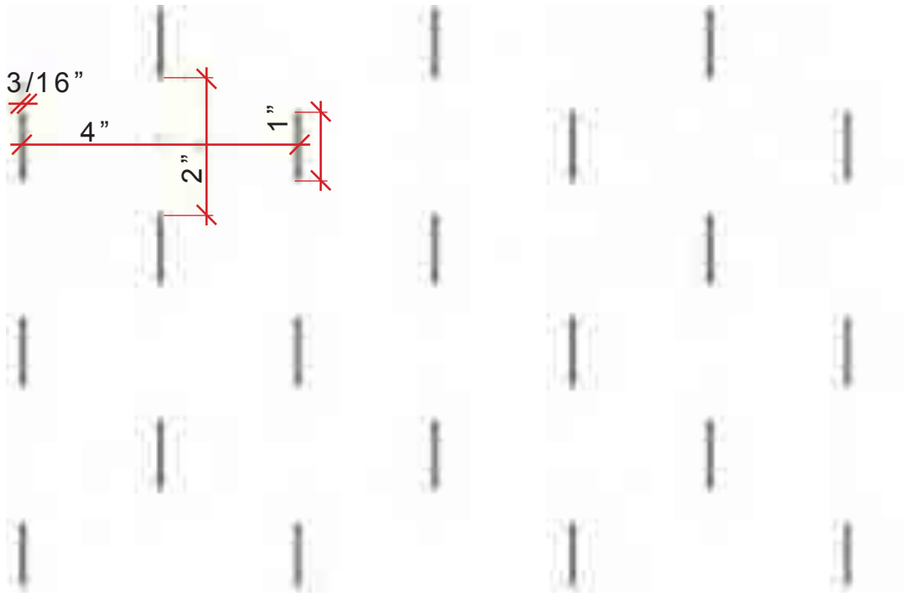
JAVITS CENTER RENOVATION: Green Roof, Urban Habitat

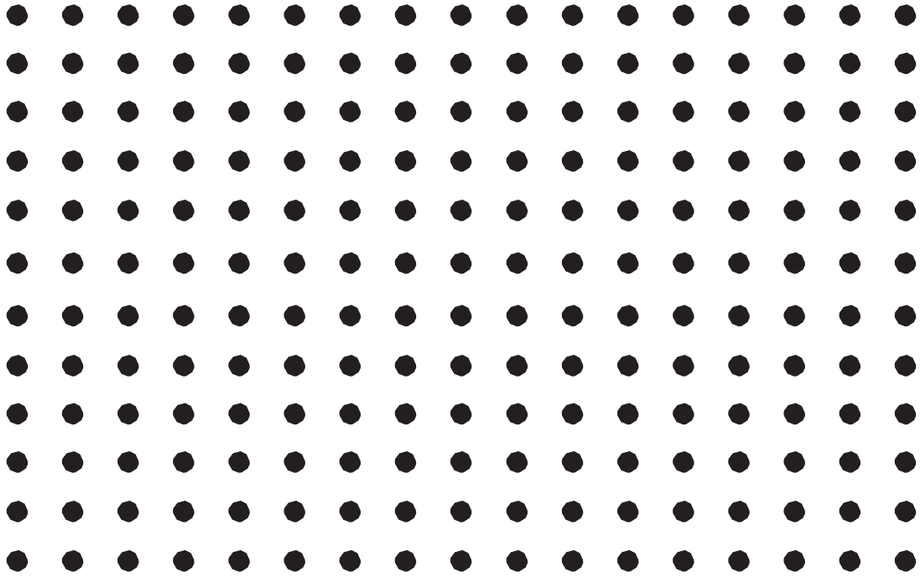
JAVITS CENTER RENOVATION: Replacement of Spandrel Glass with Metal Panel

JAVITS CENTER RENOVATION: Interior View

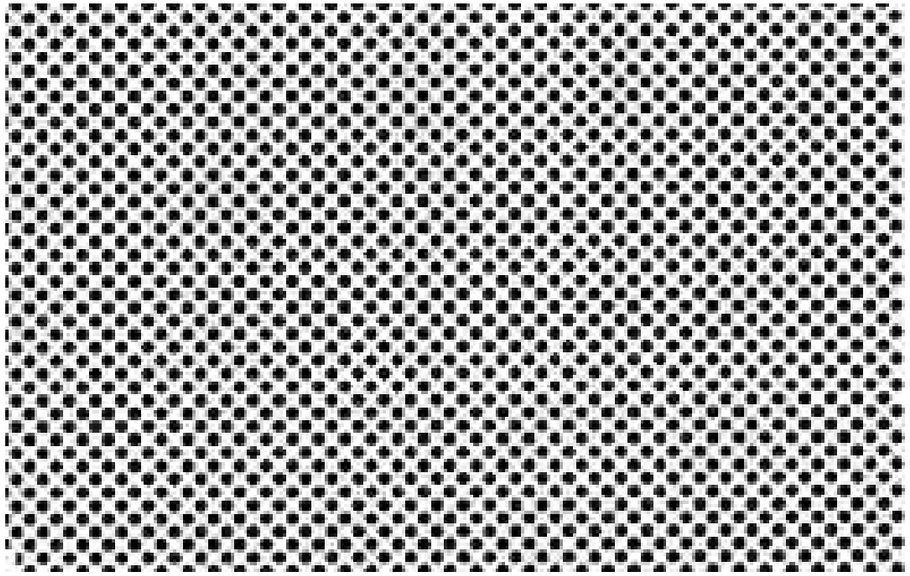
JAVITS CENTER RENOVATION: Frit Pattern Studies







15% Opacity 3/8” Round Dot



30% Opacity 1/8” Round Dot

JAVITS CENTER RENOVATION: Proposed Pattern for Bird Collision Reduction

JAVITS CENTER RENOVATION: Selected Frit Pattern for Reduction of Solar Heat Gain

JAVITS CENTER RENOVATION: Glass Coating & Frit Color Selection Process

JAVITS CENTER RENOVATION: Glass Before & After

JAVITS CENTER RENOVATION: Frit From Exterior

JAVITS CENTER RENOVATION: Frit from Interior

JAVITS CENTER RENOVATION: Results

Results:

- Increased Performance
- Increased Daylight
- Increased Transparency

Spring Migration 2013:

Total of 4 Birds Found **>90% Reduction!**

THE NEW YORK TIMES BUILDING

Design Architect: Renzo Piano Building Workshop
Executive Architect: FXCollaborative

THE NEW YORK TIMES BUILDING: Terra Cotta Screen

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COLUMBIA UNIVERSITY SCHOOL OF NURSING: Side 1 Frit

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COLUMBIA BUSINESS SCHOOL: Frit to Emphasize Shapes

Design Architect: Diller Scofidio + Renfro
Executive Architect: FXCollaborative

Source: https://www8.gsb.columbia.edu/manhattanville/design/slideshow?nid:33=32

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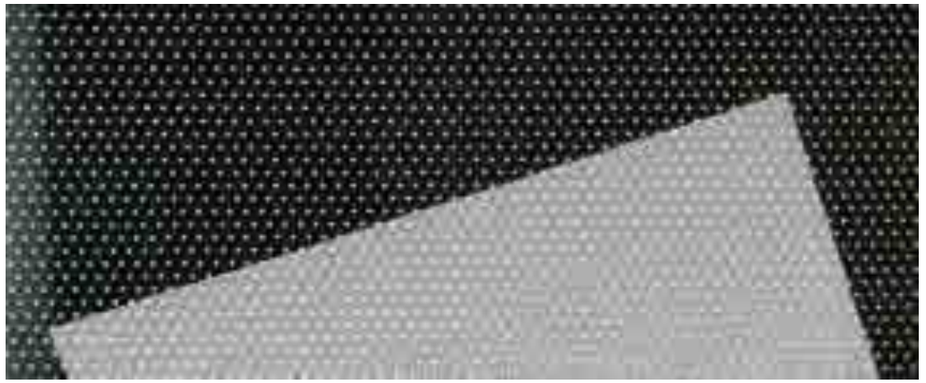
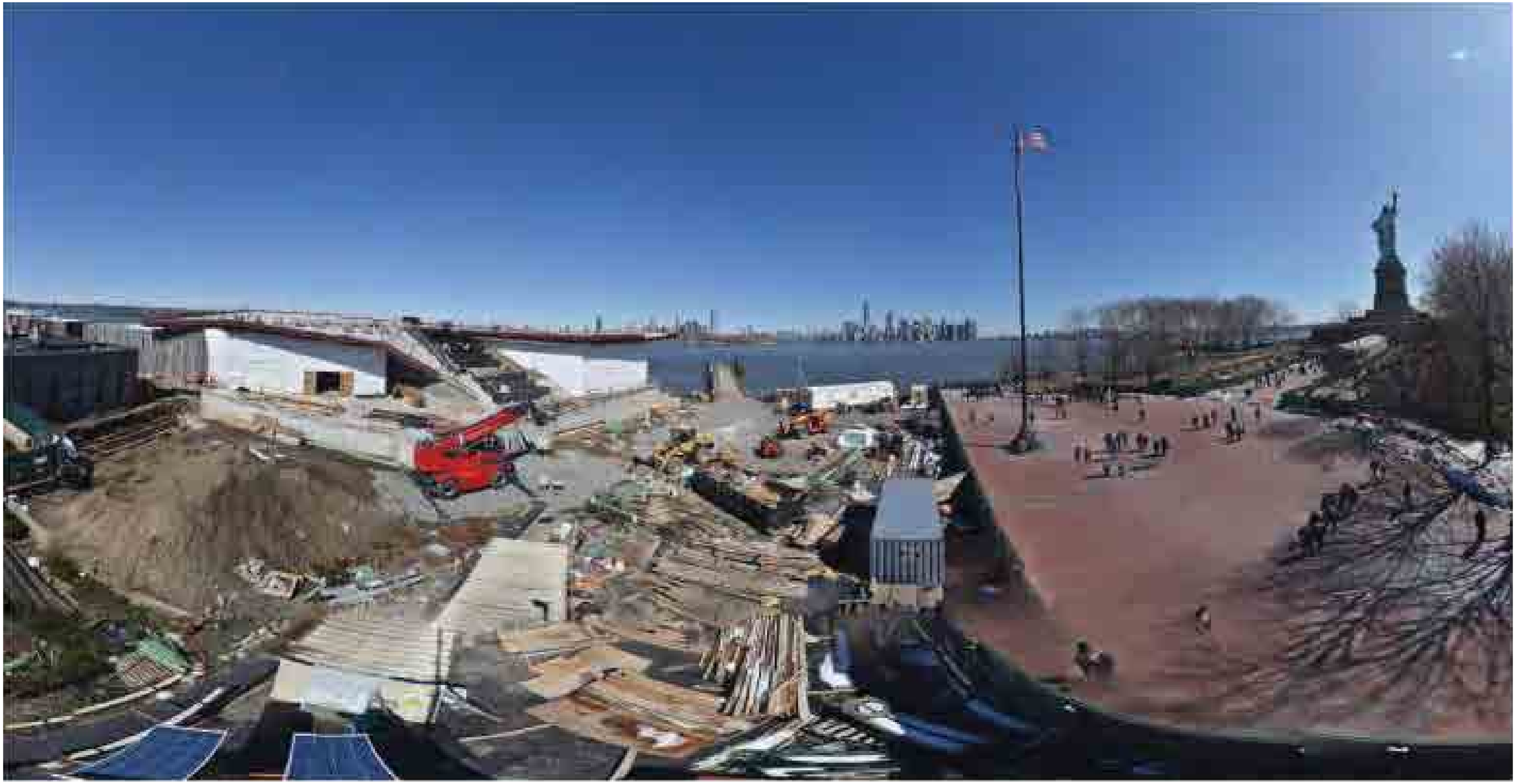


THE STATUE OF LIBERTY MUSEUM

THE STATUE OF LIBERTY MUSEUM: Construction



THE STATUE OF LIBERTY MUSEUM: Architecture Integrated with Landscape

THE STATUE OF LIBERTY MUSEUM: Interior View

THE STATUE OF LIBERTY MUSEUM: Frit Design

THE STATUE OF LIBERTY MUSEUM: LEED Pilot Credit 55

BUILDING DATA	
Number of Stories	1
Building Height	36'
Total Façade Area	20890
Façade Zone 1 Area	20890
Façade Zone 2 Area	NA
Adjusted Building Façade Area [3]	NA

ZONE 1 HIGH RISK FACTOR CALCULATION (HRF)	
Material Type with Threat Factor >75	**HR Material Area (HRA)**
material 1	0
material 2	0
Windows & Revolvers with Clear Glass	480
High Risk Area (HRA) Totals =	480
HRF= (HRA/Z1 Area) <15%	**2.3%**

THE STATUE OF LIBERTY MUSEUM: LEED Pilot Credit 55

Zone 1 ONLY	Zone 1 (Z1) ONLY CALCULATION GRADE TO 36 FT[1] & 12 FT ABOVE GREEN ROOF[2]		
Z1 Material Type	**Threat Factor**	**Material Area (A)**	**Factored Area (FA)**
Precast Concrete & Opaque Materials	0	15270	0
Curtain Wall with Fritted Glass	20	4940	98800
Windows & Revolvers with Clear Glass	100	200	20000
Elevator Fritted Glass at Roof	20	480	9600
	Z1 Area Totals=	20890	128400

Total Zone 1 ONLY Building BCTR =	**6.14648157**

<15 = BIRD-SAFE

DESIGN OPTIONS

Medium Frit

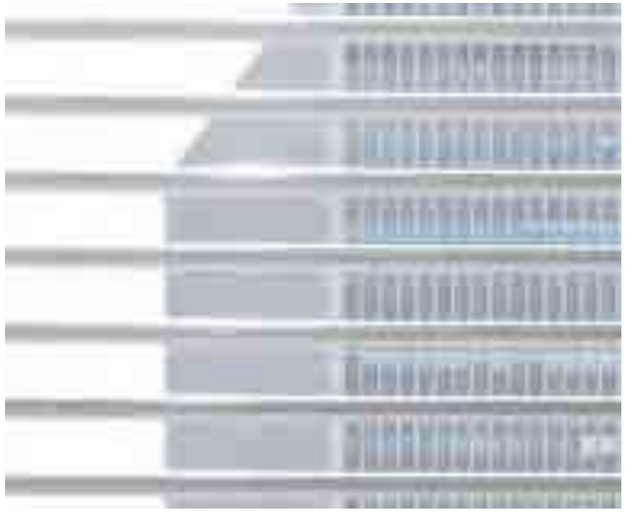
Light Frit

Linear Frit

Side 1 Frit

UV Patterning

Thin Screening



Solar Screening

Solar Shading

Daniel Piselli AIA, LEED, CPHD

Senior Associate

FXCollaborative

dpiselli@fxcollaborative.com

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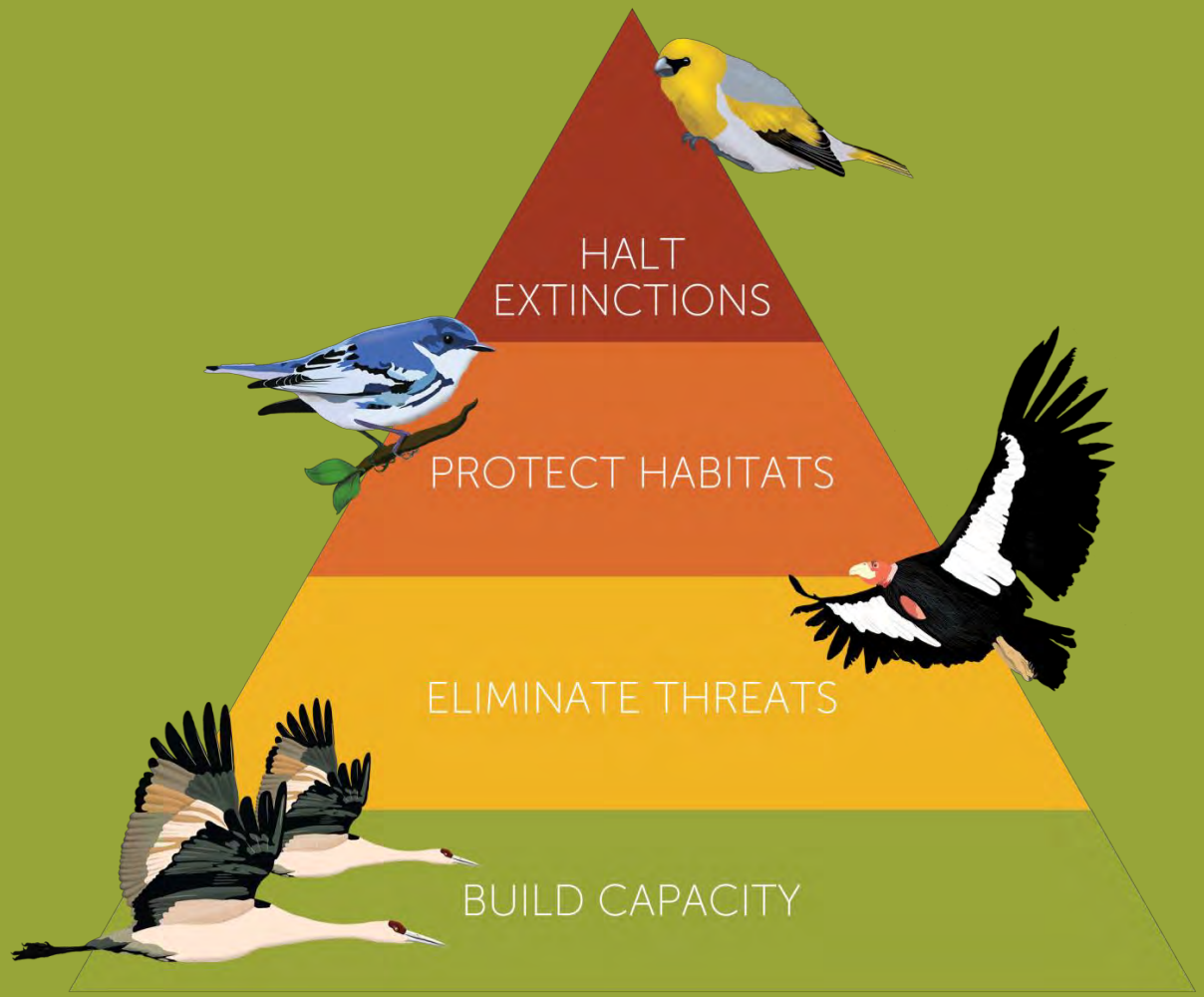

Christine Sheppard, Ph.D.
Director, Glass Collisions Program
American Bird Conservancy

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Comparative Mortality

Collisions with:	Date of reference	Mortality estimate
Wind turbines	2012	573,000
Cell towers	2012	6,800,000
Power lines	2005	175,000,000
Buildings/glass	2013	1 billion
Cats	2013	1.5—3 billion

Links to sources at: http://www.abcbirds.org/abcprograms/policy/collisions/index.html

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Most, but not all, victims are songbirds,

...especially warblers

Migrating at night,

Colliding by day,

Why don't we see more of them?

Photo: Lynne Parks

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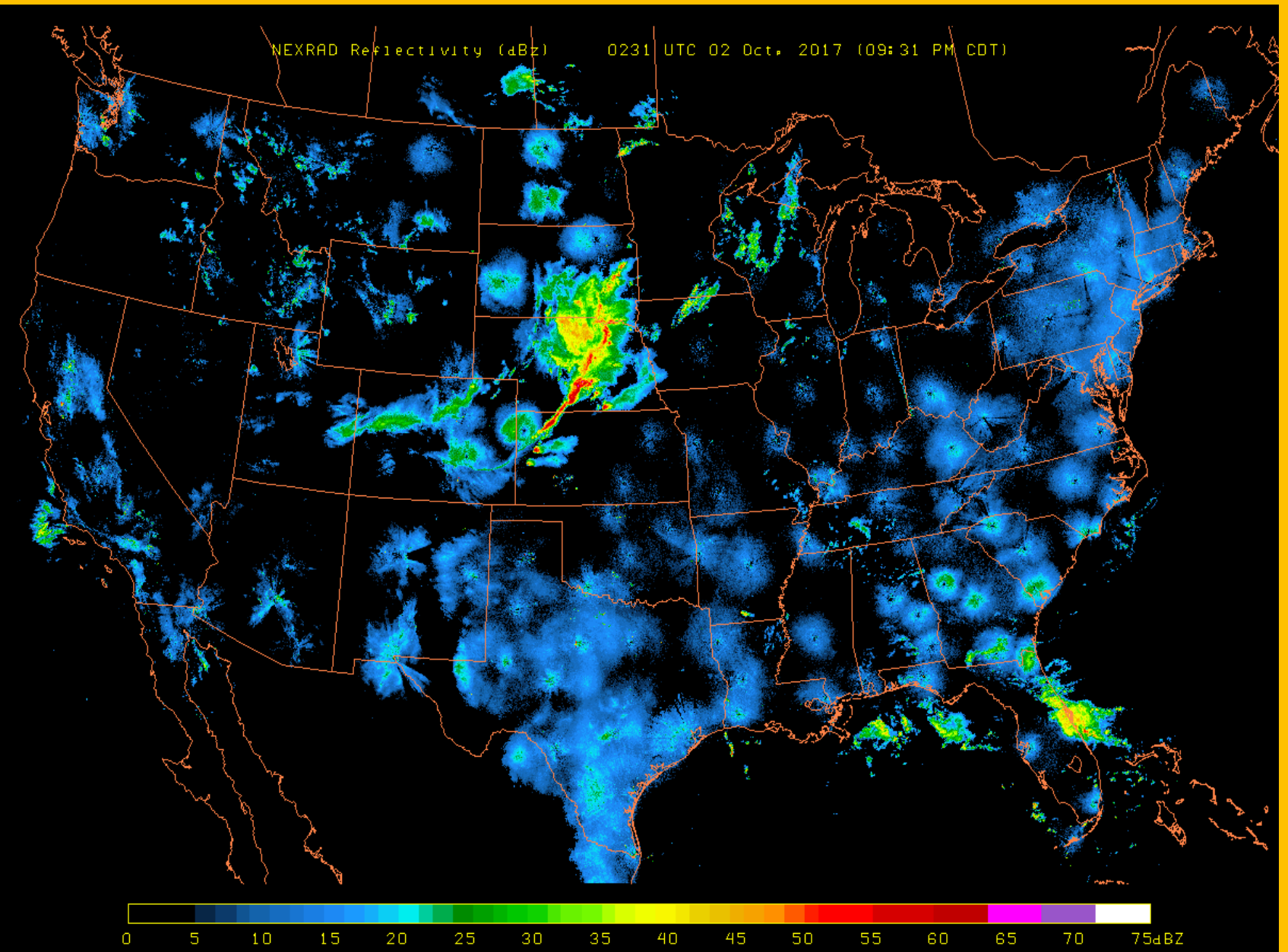

Radar can be used to follow birds migrating at night.

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Bright Light, Dark Background = Circling

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Urban lighting increase: birds attracted everywhere into built environment

Houston 1873:
twenty streets

Houston Metropolitan Area
10,000 Square Miles
Larger than State of New Jersey

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People think they can see glass...

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Birds don’t speak architecture

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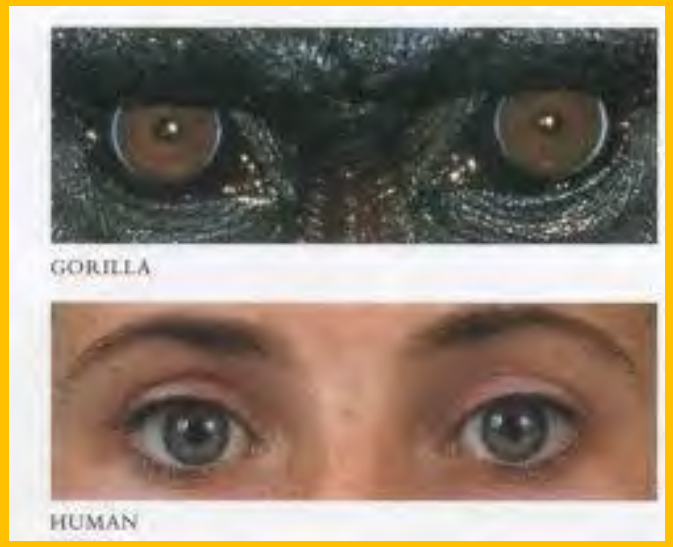
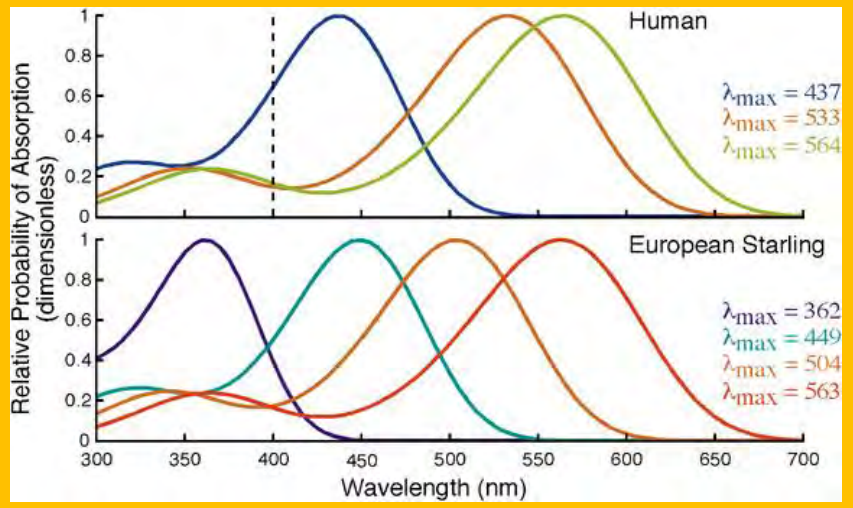
Bird's Eye viewing

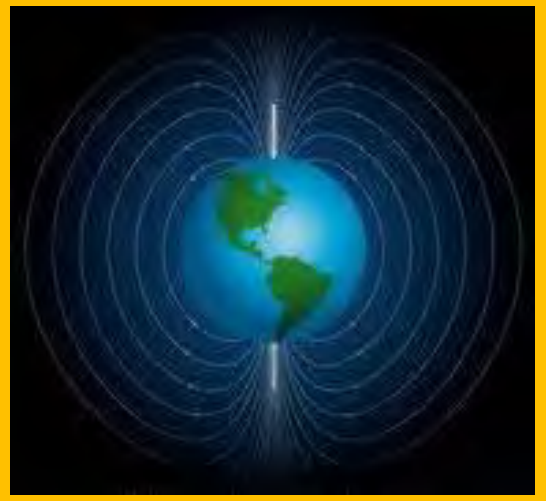


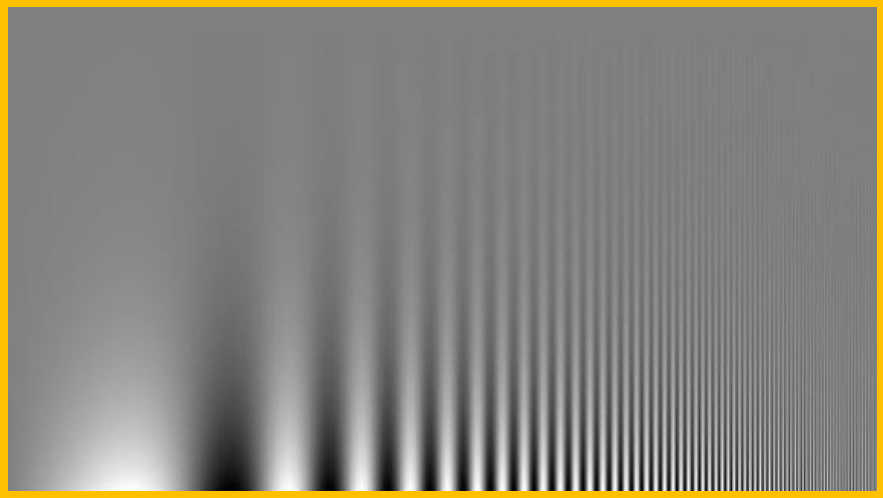
Birds have little depth perception, extensive peripheral vision, other senses to determine speed

Birds see more colors, magnetic field, many don't see UV

Birds' resolution < human







Birds often don’t expect a barrier ahead…

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not looking where you're going .....

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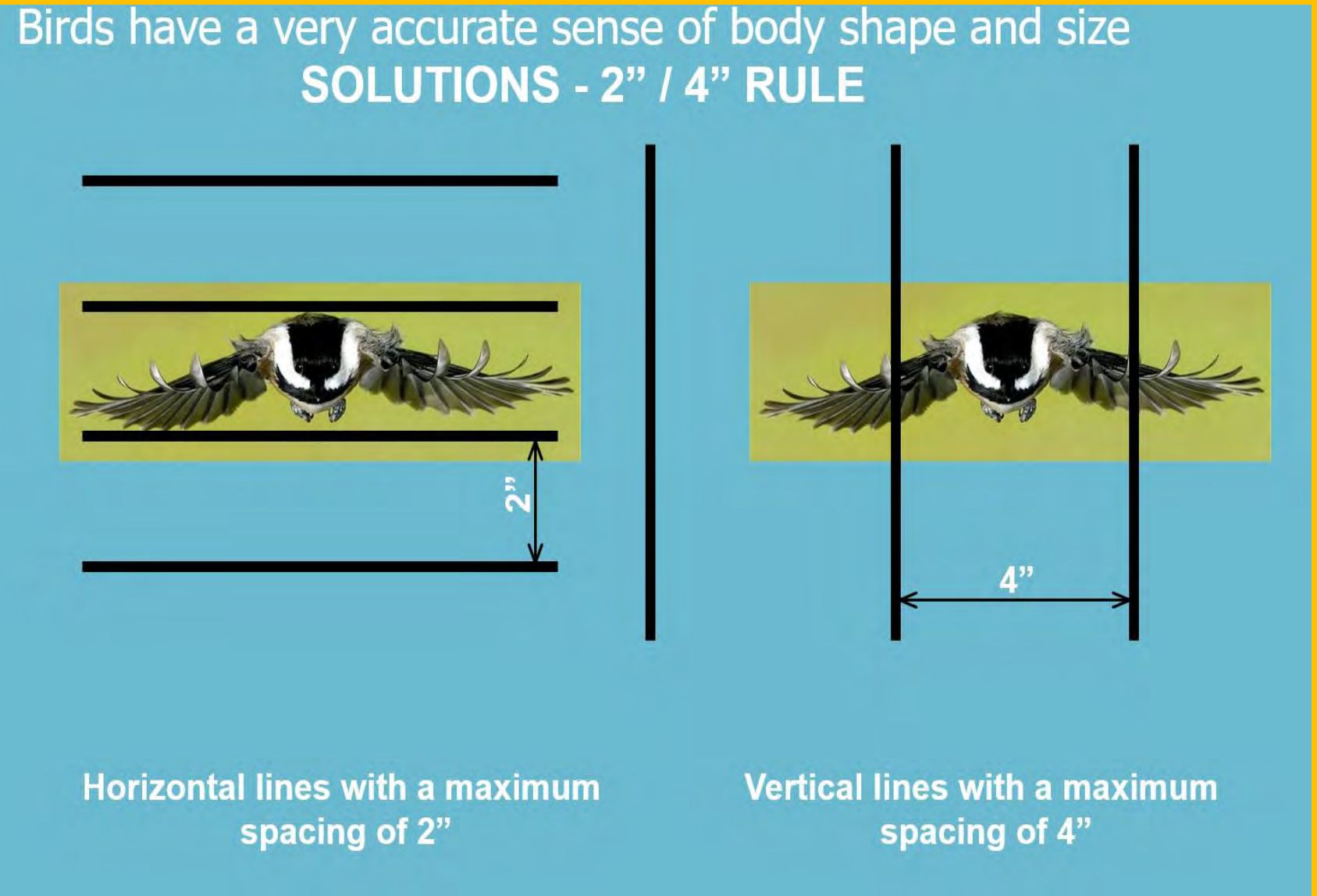
What stops collisions?

Patterns that act as visual barriers



Dots:
at least 3/8” diameter

Lines: at least 1/8” wide

Irregular shapes and spacing fine!

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Legislation, Ordinances and Guidelines

MANDATORY

- Minnesota: Buildings, Benchmarks and Beyond
- San Francisco, CA: Standards for Bird-safe Buildings
- Oakland, CA: Bird Safety Measures
- Highland Park, IL new public buildings
- Cook County, IL (unincorporated)
- Toronto, Canada: Bird-friendly Development Standards
- Ontario, Canada: Environmental Protection Act, Species at Risk Act

VOLUNTARY

- Sunnyvale, CA: Standards for Bird-safe Buildings
- Palo Alto , CA
- California: CALGreen
- Calgary, Canada
- Barrington

IN PROGRESS

- Federal Bird-safe Buildings Act
- Portland, OR
- San Jose, CA
- Washington, DC
- Maryland

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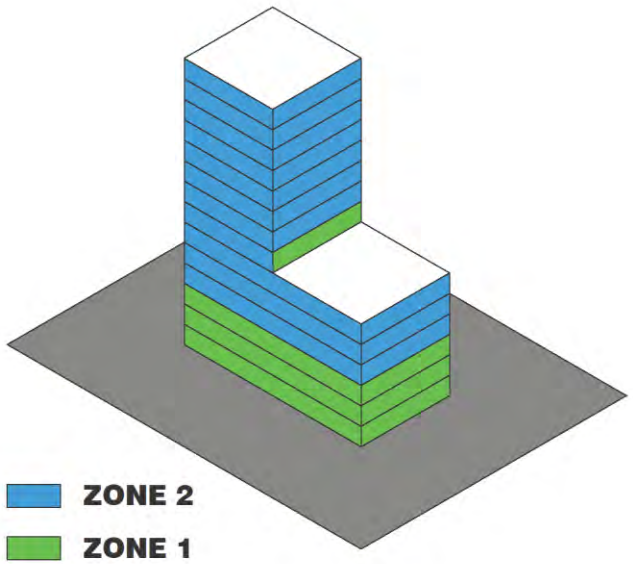
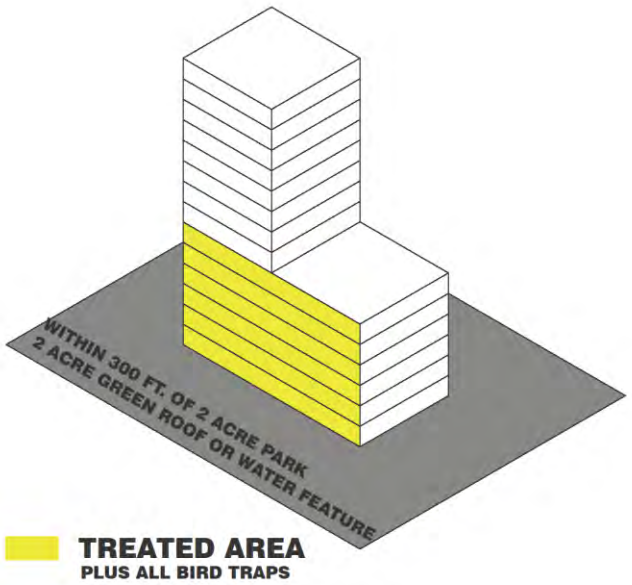
LEED Pilot Credit #55



LEED PILOT CREDIT # 55



SAN FRANCISCO BIRD-SAFE BUILDING STANDARD

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What is a bird-friendly building?

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More glass = more collisions

Low rise buildings kill more birds than high rise – more of them, often in suburban habitat

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Cardinal directions vs reflected vegetation

Prioritize lower floors!

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How to design a bird-friendly building:

Incorporate solutions from the beginning to eliminate added extra costs.

Strategies:

- Reduce exposure of glass
- Incorporate signals in / on glass
- Minimize use of glass

Bird friendly design overlaps with solar shading, glare control, security, thermal control, energy efficiency, and can be part of a distinctive design aesthetic.

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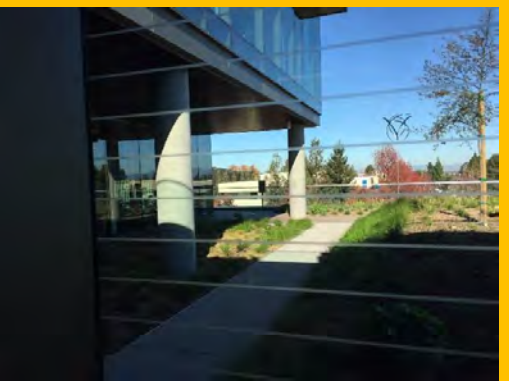
Fritted glass



Intuit HQ, WRNS Studio

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Fritted glass

Anchorage Museum,
David Chipperfield

AMERICAN BIRD CONSERVANCY

Reduced exposure of glass

Cooper Union, NYC Morphosis

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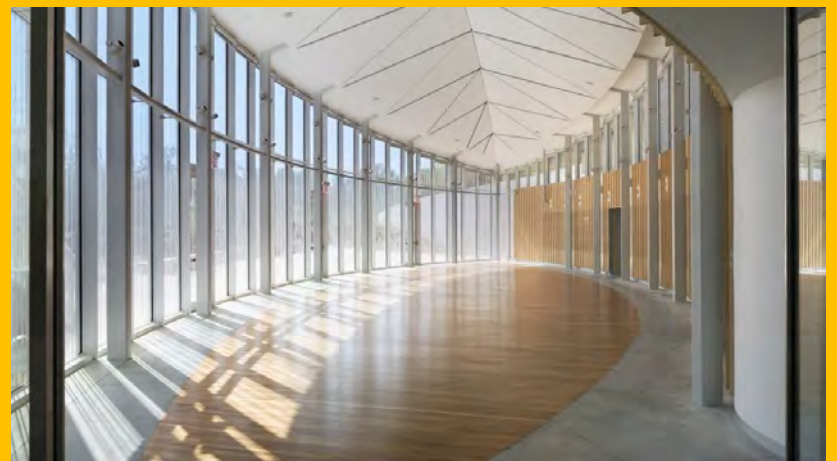
Bird-friendly glass



Brooklyn Botanical Garden,
Weiss Manfredi

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Reduced glass

Bronx Emergency Call Center,
SOM

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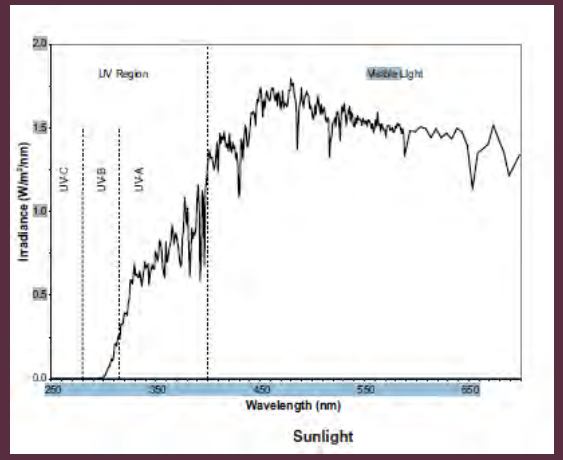
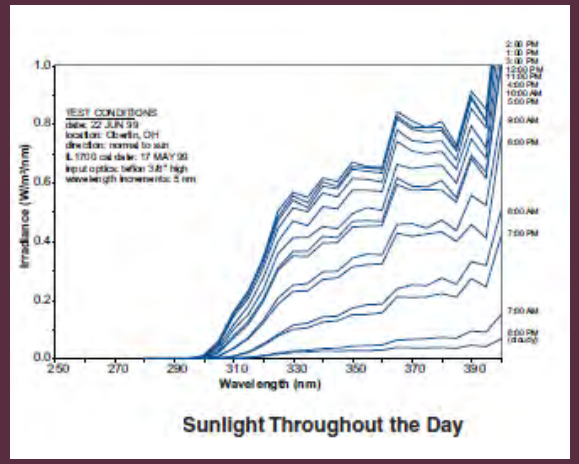
What About UV Patterns?



Arnold Glas
Ornilux Mikado

Glas-pro
Bird Safe Glass



Glastroesch
Silverstar Birdprotect Glass

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Retrofit: film

Northwestern University
Solyx Bird Safety Film

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Retrofit: Solyx Bird-safety Film

Left: Key West Airport
Above: Bronx Zoo

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Retrofit: Feather Friendly

U of Pennsylvania Vet School

U of Guelph Arboretum

Pan American Sports Centre

AMERICAN BIRD CONSERVANCY

Retrofit: Collidescape

National Renewable Energy Lab

Cape May Community College

AMERICAN BIRD CONSERVANCY

Retrofit: Acopian BirdSavers

University of Florida

Private Home, Michigan

AMERICAN BIRD CONSERVANCY

Retrofit: Home solutions

AMERICAN BIRD CONSERVANCY

Resources

CSheppard@abcbirds.org

Download at ABCBirds.org

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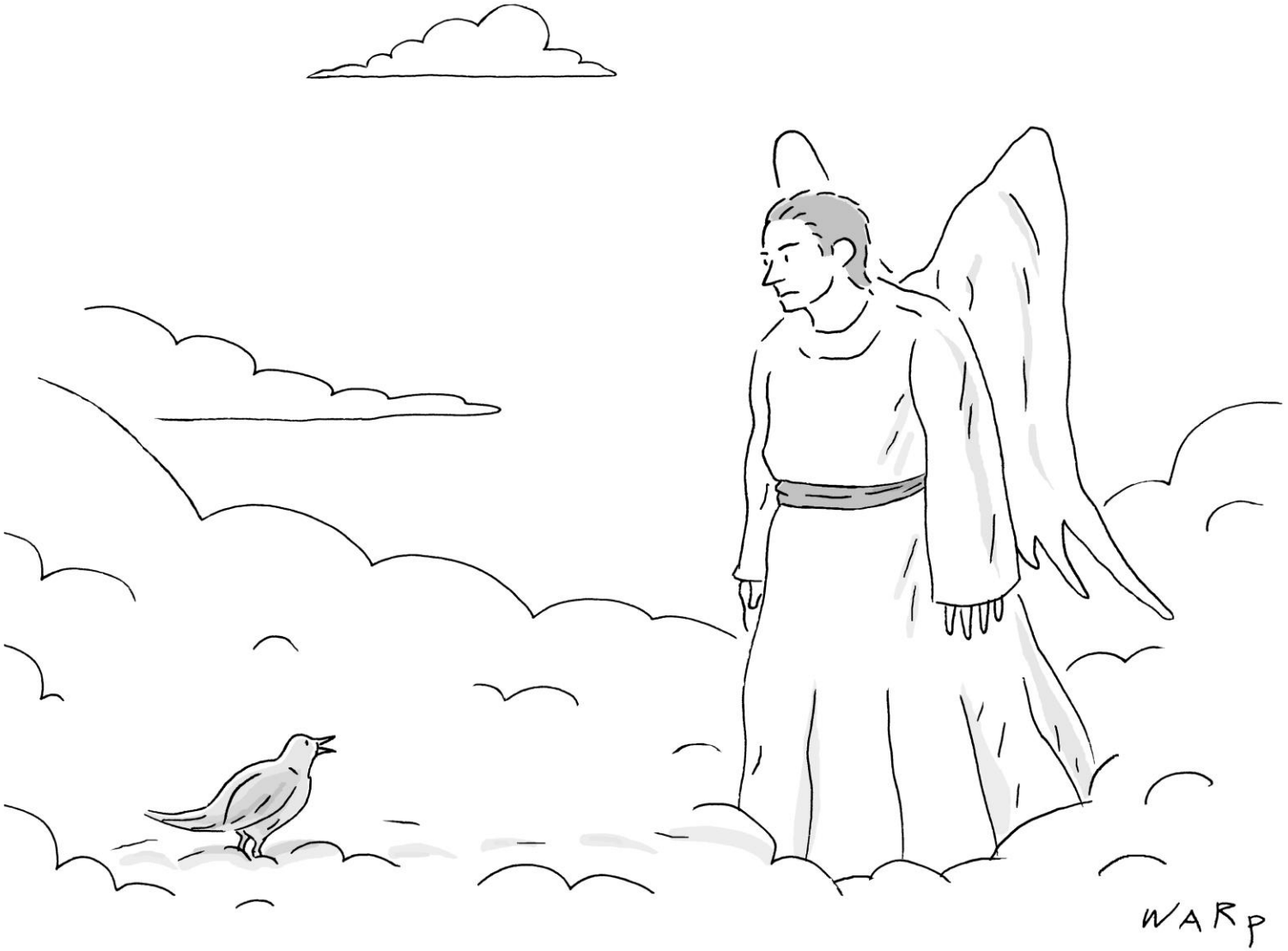
Learning Objectives

1. Identify factors leading to bird-glass collisions
2. Specify building design and lighting techniques to reduce these collisions
3. Assess success of current case studies relating to bird/glass safety
4. Follow up on recent code and advocacy developments relating to bird-friendly design

Bird-friendly Buildings in an Urban Setting

District Department of Energy and Environment (DOEE) Presentation
March 13, 2018

Anne Lewis, FAIA,
President
City Wildlife, Inc.

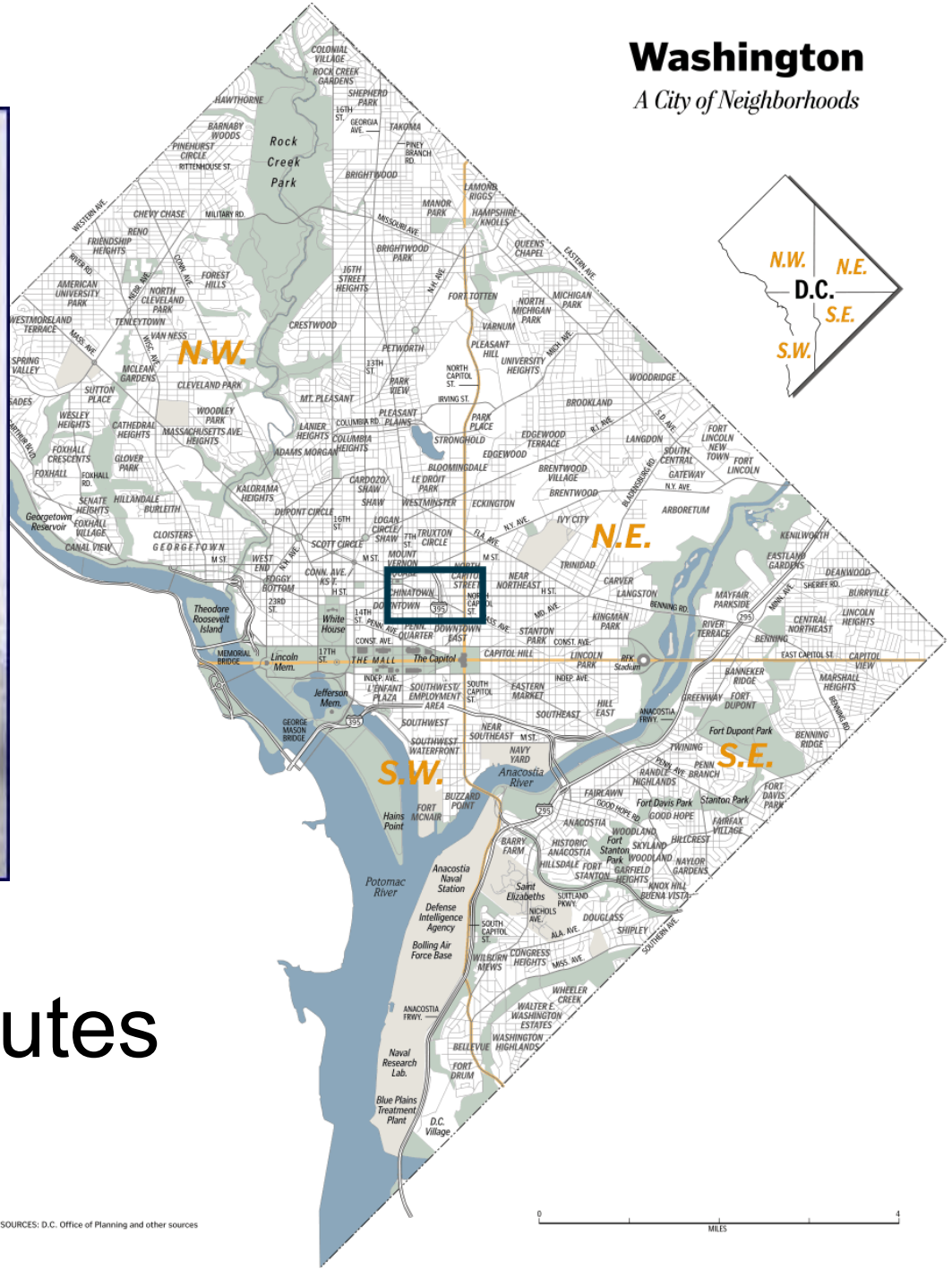


"You run into a window, too?"

New Yorker, October 10, 2011

Yellowthroats – a mated pair

Photo: NYC Audubon Project Safe Flight



Walking the Routes

Sorting the birds

Some *Lights Out DC* birds

2010 Lights Out DC Birds, City Wildlife, Inc.

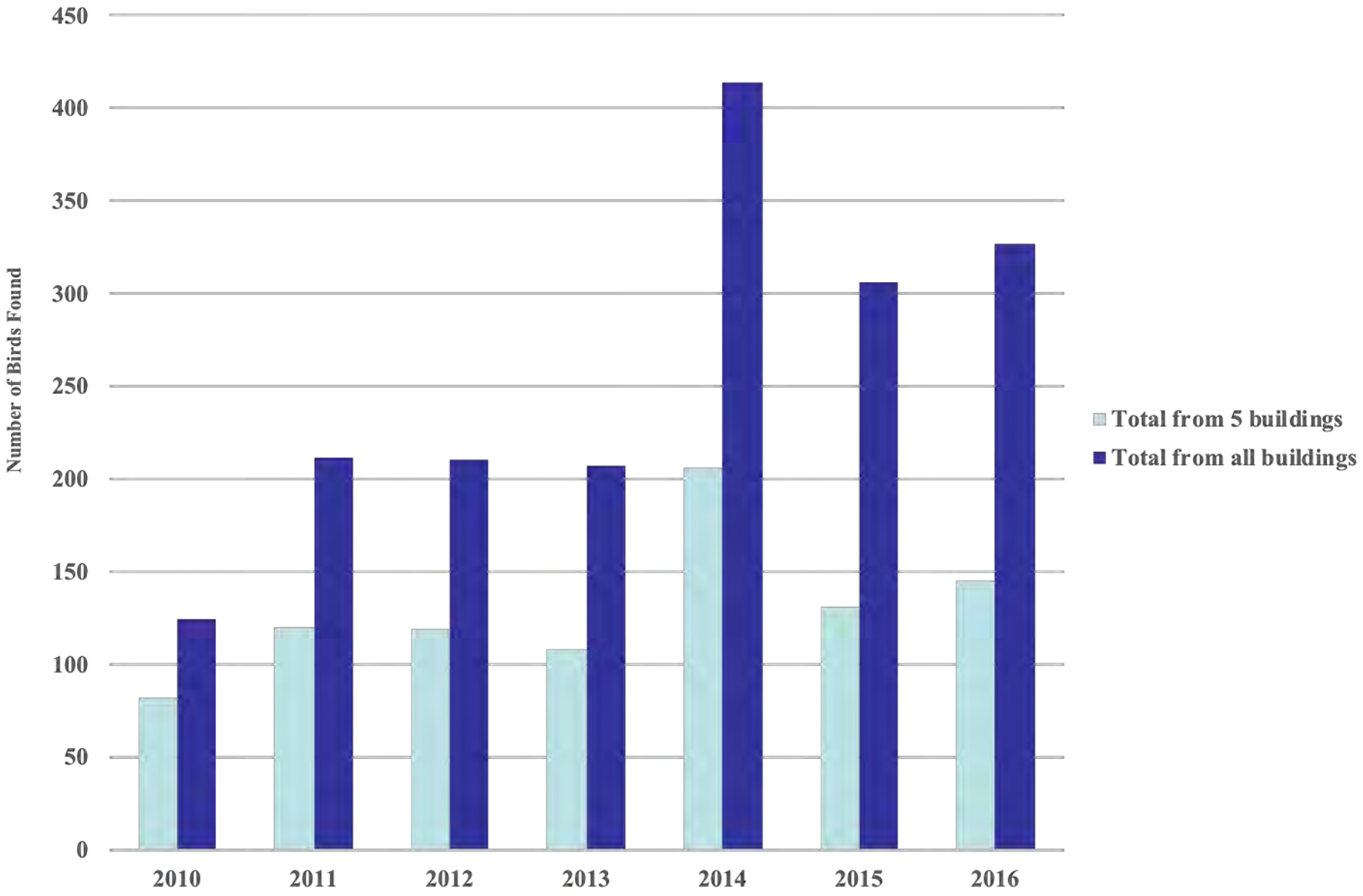
More every year…

2016 Lights Out DC birds

1 billion birds a year

Source: FLAP, Toronto, 2009

Lights Out DC Bird Strikes



A dangerous situation…

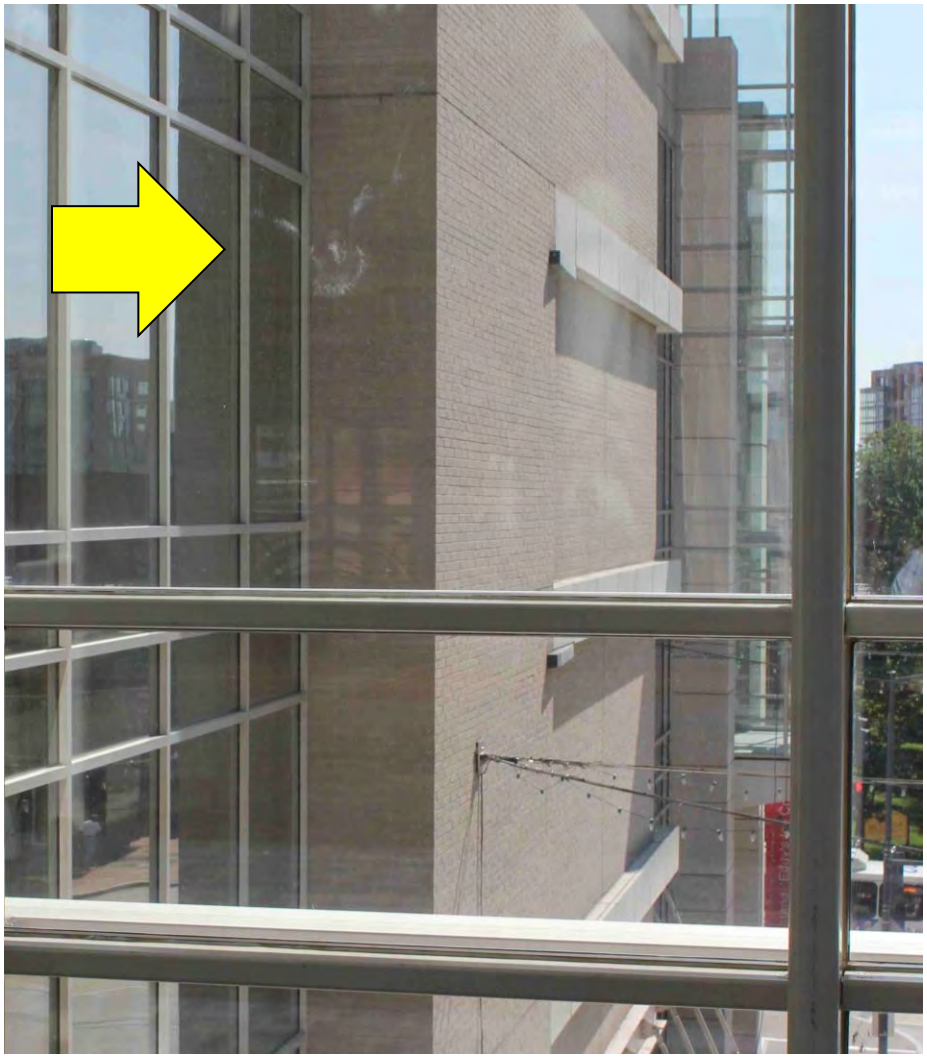
Reflections in the morning

Transparency at night

Transparency

Reflectivity

Transparent overpass



Imprint of a collision

Bird-safe film, exterior application

What we see.

What they see.

A fly-through situation


A runner - up

Nice on the inside…

a hazard outside

Anacostia Library
Architects: The Freelon Group

Bird Friendly Design

Shaw Library
Architect: Davis Brody Bond Aedas

Bird Friendly Design

Consolidated Forensic Laboratory Project
District of Columbia Department of General Services

Bird Friendly Design

What Can Architects Do to Help?

Wood Thrush
Official Bird of DC

- Reduce Lighting
- Follow Bird-Safe Design Guidelines
- Use and Test Bird Safe Products
- Document and Report
- Spread the word

Lack of public awareness is the greatest threat.

Reduced Lighting Saves Energy:

Thurgood Marshall Building Atrium

- Atrium lighting reduced from 11pm-6am year-round
- Savings: 28%

DC Court of Appeals Pavilion

- Pavilion lighting reduced from 11pm-6am during migration
- Savings: 15%

LEED Pilot Credit 55:
Bird Collision Deterrence

- Bird Collision Threat Rating: less than 15
- Building separated into Zones 1 and 2
- All materials assigned a Threat Factor
- Interior and Exterior Lighting Requirements
- Post construction monitoring and plan for corrective action

Green Buildings Shouldn't Kill Birds

Photo: Matt Reinbold

A proposal for DC's Green Construction Code

- An elective under Appendix A
- Incorporates LEED Pilot Credit 55
- Provides one extra credit for buildings that remediate more glass (> 40% glass overall, or > 75% glass on any two facades)
- Lighting reduced until 7 am

Green Buildings Shouldn't Kill Birds

Photo: Matt Reinbold

Contact us for help.

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