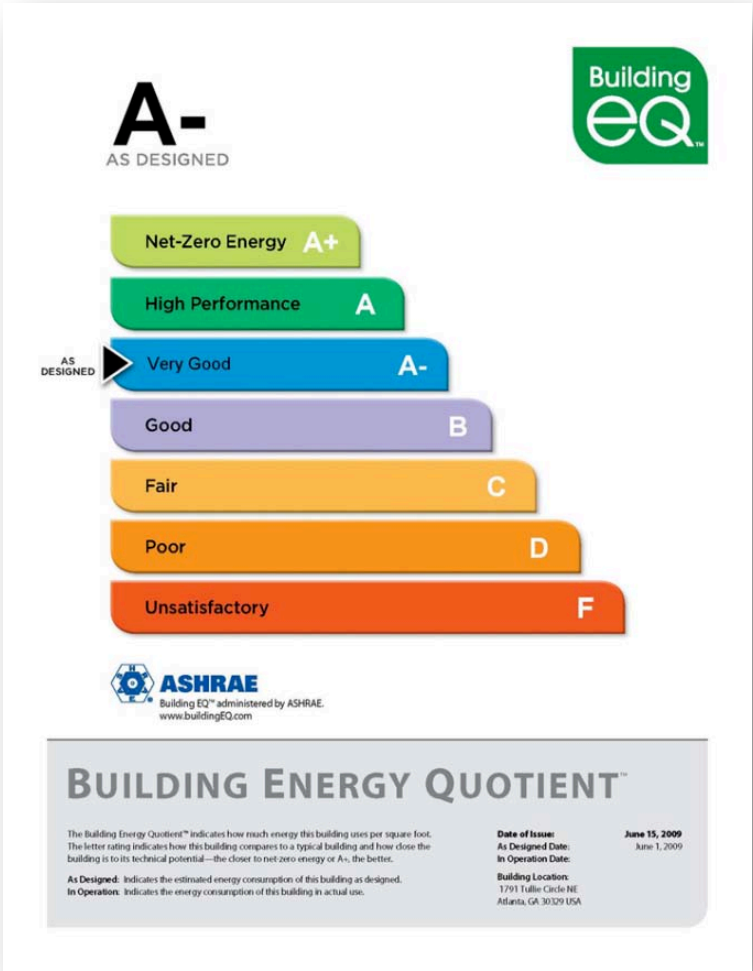


Energy Auditing from Walk-Through to Investment Grade



NJ Clean Energy Conference and Leadership Awards

Atlantic City, NJ

October 21, 2009



Ryan Merkin, LEED AP + Homes

Senior Project Manager
Steven Winter Associates, Inc.

rmerkin@swinter.com

212-564-5800 x116



Steven Winter Associates, Inc.
Building Systems Consultants

Walk-through & Investment Grade: Easy Stuff

- Lighting

- Incandescents?
- Occupancy Sensors/Daylighting/Photocells
- Display Cases
- Exit Signs
- Metal Halide Fixtures

- Water

- Fixtures
- Temperature
- Storage?



Walk-through & Investment Grade: Building Envelope

- Insulation
- Windows
- Airsealing



...But cannot realize energy & comfort benefits of air sealing with properly functioning ventilation...



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Ryan Merkin, October 21, 2009

Retro-Commissioning: Curtain Wall Failure

Vision & Spandrel
Glazing

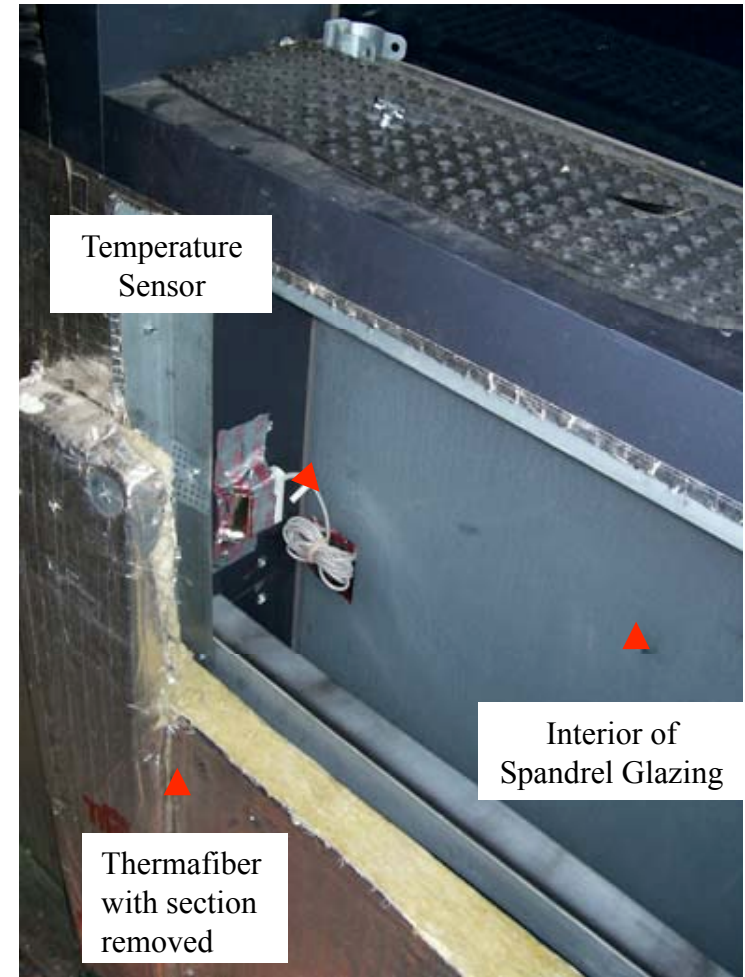


Inc.
ts

Winter Infrared
Image



Installation of Temperature
Sensors



Ryan Merkin, October 21, 2009

Retro-Commissioning: Curtain Wall Failure

Owner Comfort Requirements

for Building Mechanical System Design & Operation

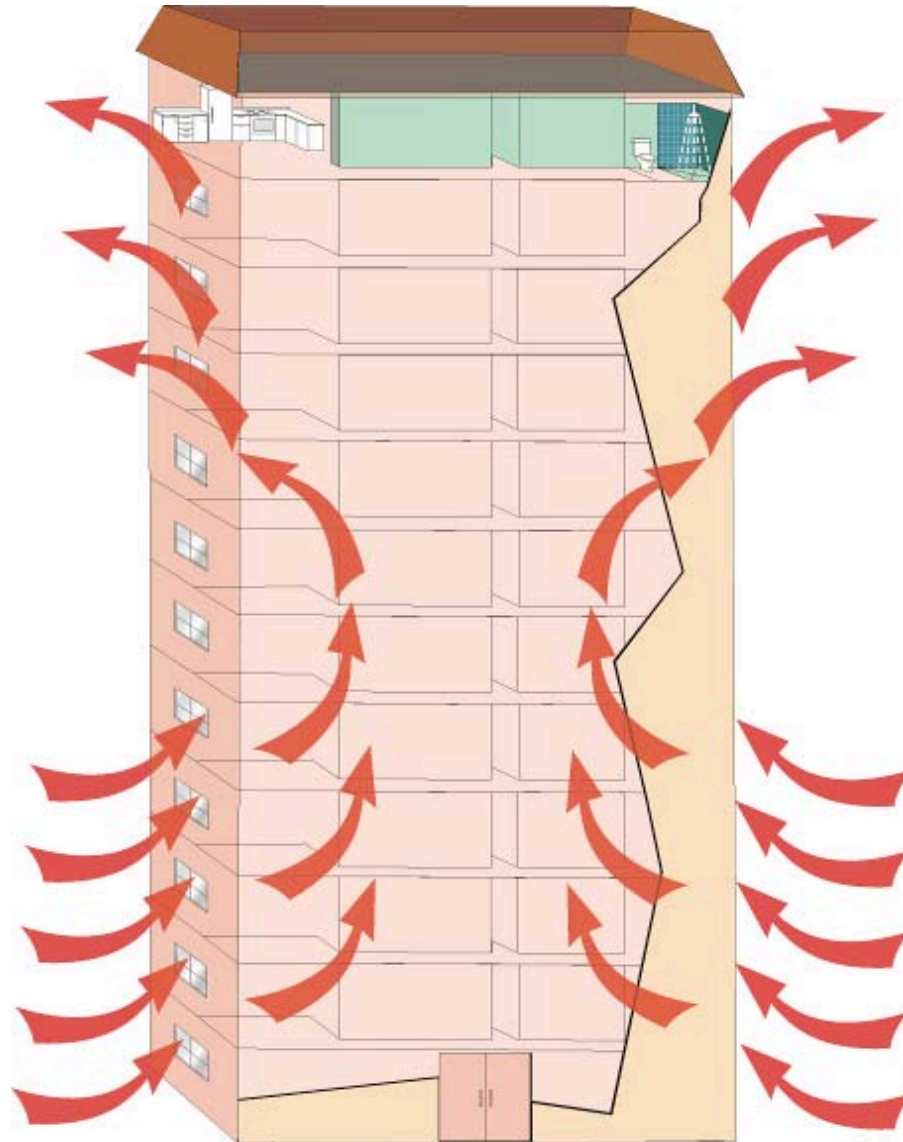
- 75 F in summer (+/- 2 F)
- 72 F in winter (+/- 2 F)
- Summer & Winter: 50% RH +/- 5%

Problem: Envelope Cannot Handle 50% Winter RH

Easy Solution: Don't Humidify Glass Buildings



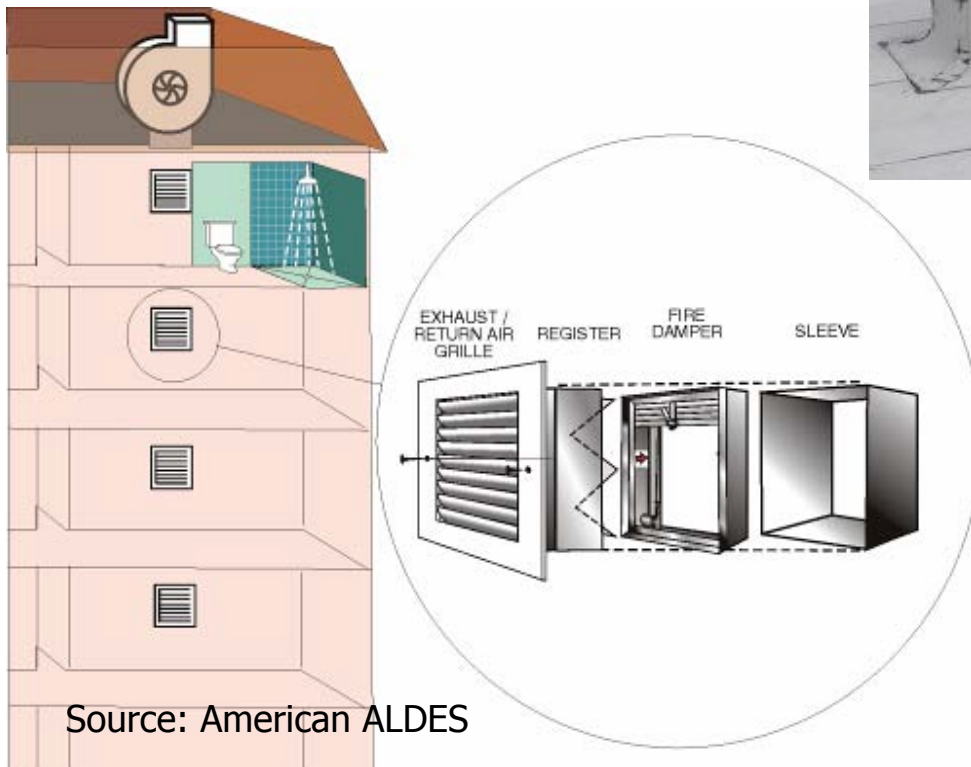
How Bad Envelopes Can Happen to Good Mechanical Systems... And Resulting Comfort Problems



Building Tight and Ventilating Right

Central Exhaust

- Roof fans
- Vertical shaft
- Horizontal take-offs
- Sidewall or ceiling grilles at each floor



Source: American ALDES

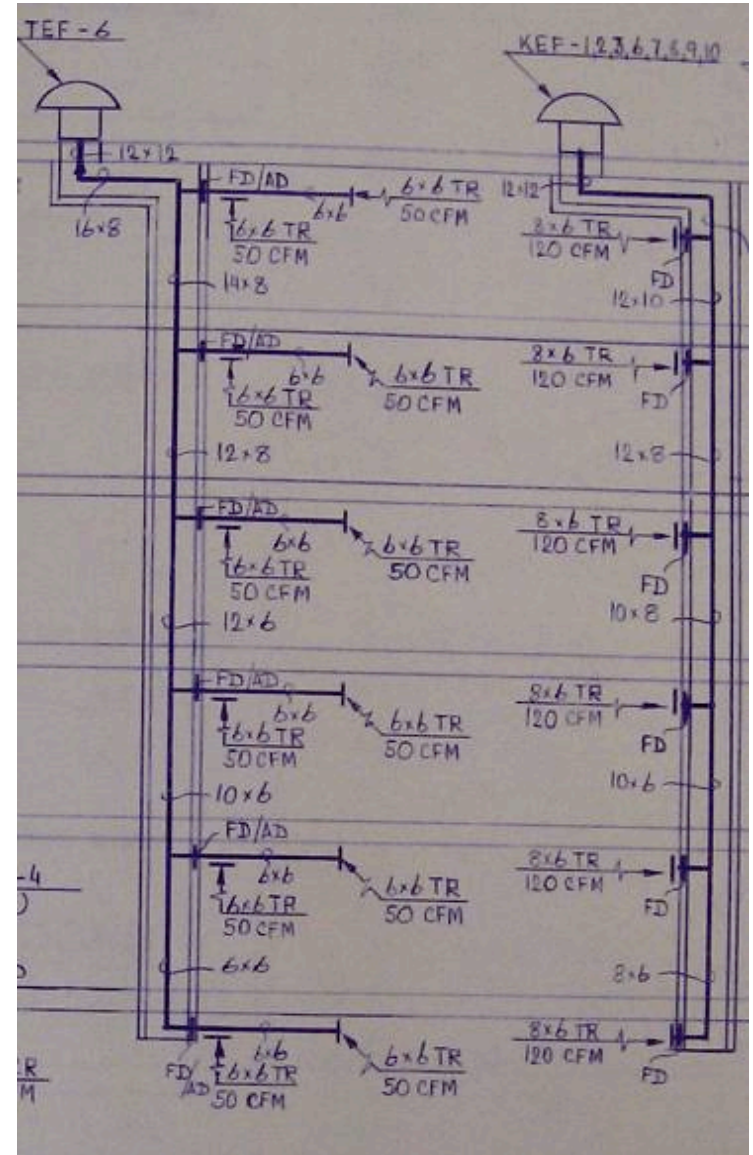
Central Systems: All or Nothing

- Continuous Venting (preferable)
- Intermittent Venting

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The Mechanical Designers World View

- Balancing damper → transferring liability
- Many grilles on different floors + relatively low exhaust CFM targets = difficult to balance.
- Constantly changing wind and stack effect pressures
- Building inspectors are worried about cranes falling down
- Contractors don't have the right gauges



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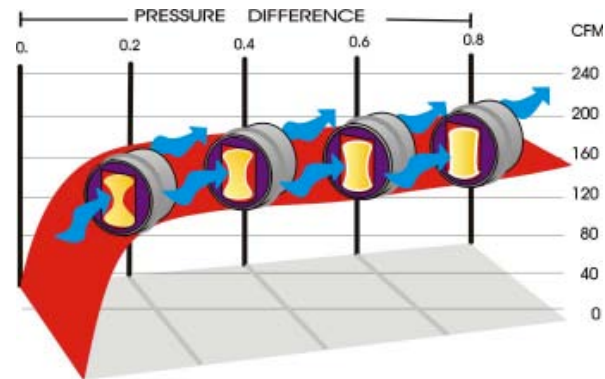


Solutions...

Seal Ducts



CAR Dampers



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Source: American ALDES

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Walk-through & Investment Grade: Building Systems

- Transformers
- Controls
- Direct-drive Fans
- VFD for Pumps and Fan Motors
- DCV & ERV
- Retro-commissioning
- Tariff & Rate Analysis
- Solar Photovoltaics
- Cogeneration



NJ: Local Government Energy Audit (LGEA) Program

- 40 current projects
- Incentives up to 100% of audit cost
- ASHRAE Level II Audit



NJ: Pay for Performance (P4P) Program

- C&I Facilities
- Includes Multifamily (200kW)
- Existing Buildings and New Construction (launching Nov 2009)
- 15% Energy Savings Target
- LG&A Buildings can enroll
- Incentives



Energy Auditing from Walk-Through to Investment Grade

Thank You

Ryan Merkin
Senior Project Manager
rmerkin@swinter.com
212-564-5800 x116

Steven Winter Associates, Inc.
307 7th Avenue, Suite 1701
New York, NY 10001
www.swinter.com

Ryan Merkin, October 21, 2009



Steven Winter Associates, Inc.
Building Systems Consultants