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Performance Testing for QA and Commissioning

Professor John Straube, P.Eng.
Faculty of Engineering
University of Waterloo
Principal, Building Science Consulting Inc.

University of Waterloo

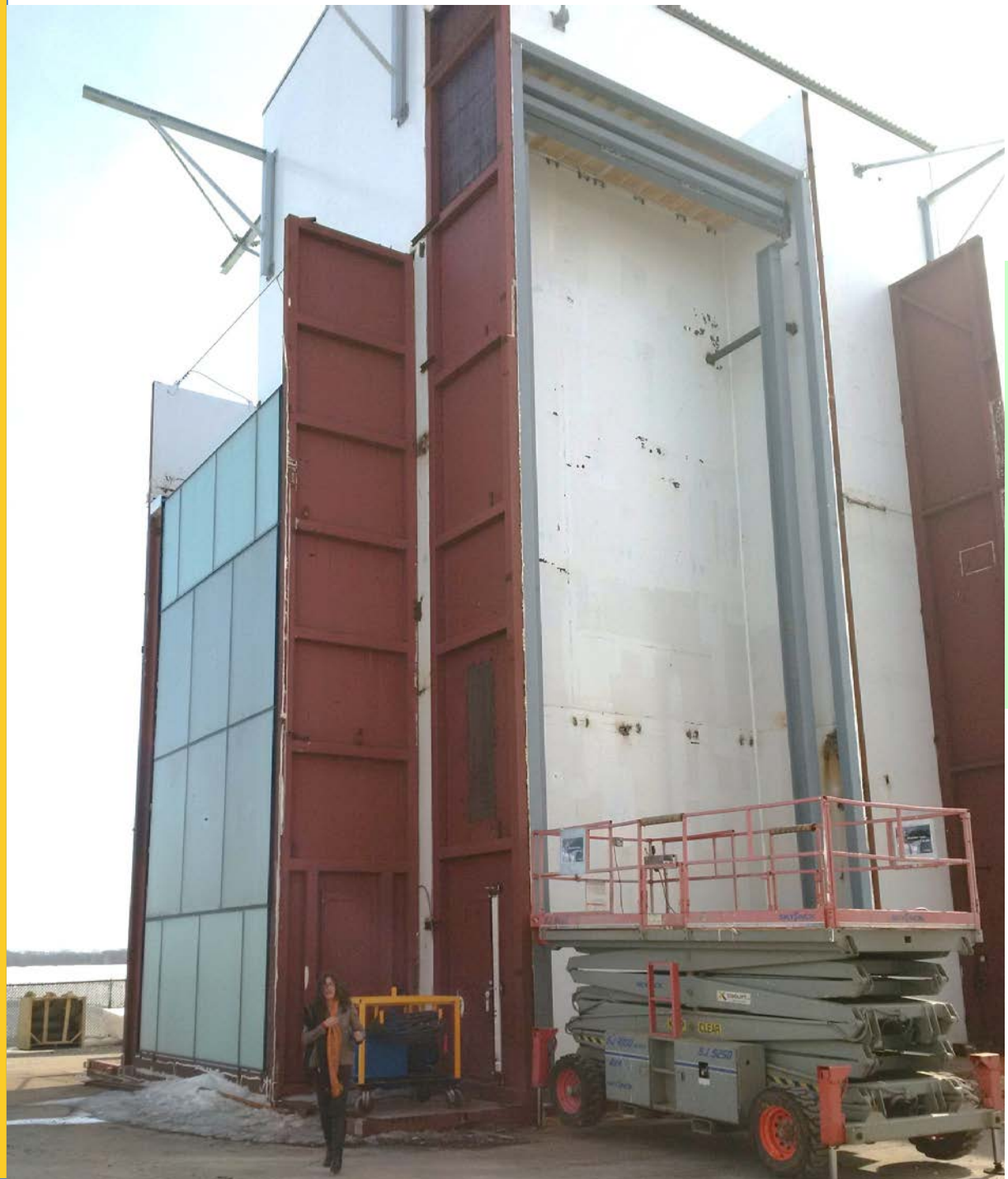
www.buildingsciencelabs.com

Beware Dogma

- Many projects don’t need ASHRAE/NIBS full commissioning approach
- ASTM/AAMA testing are often not the most appropriate or meaningful
- Complex and expensive lab tests do little to ensure success of built product
- Extensive field/construction tests do little to ensure future long-term performance

ASTM Standard Material test

Product Development / Assessment Test



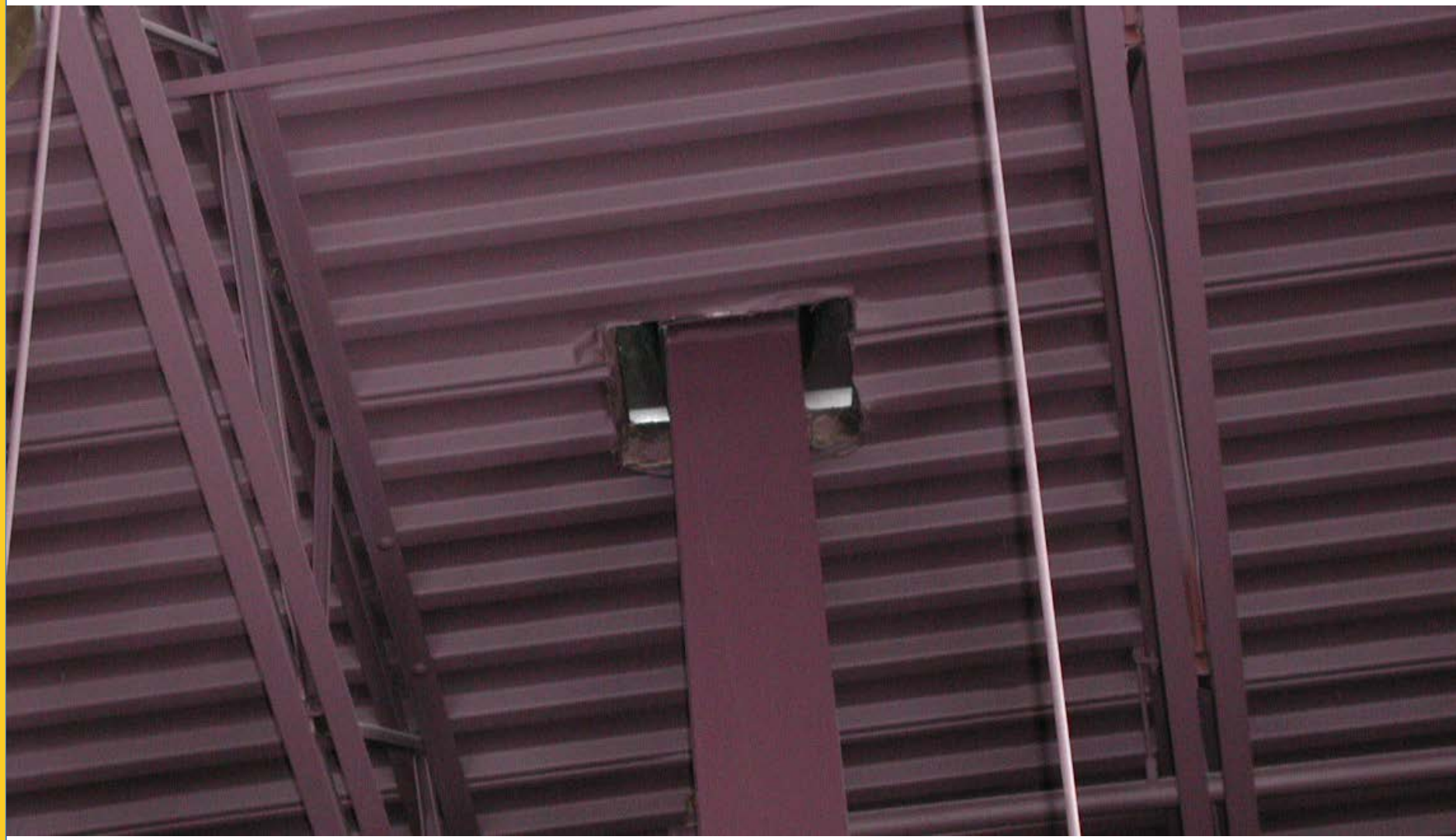
Large, multi-story, full-scale testing, Expensive!

Best for product development

Site conditions and staff can be very different


Aesthetic mockups. Not cheap for just looks. Small increase in cost allows for major constructability, tolerance QA

What test should I do?



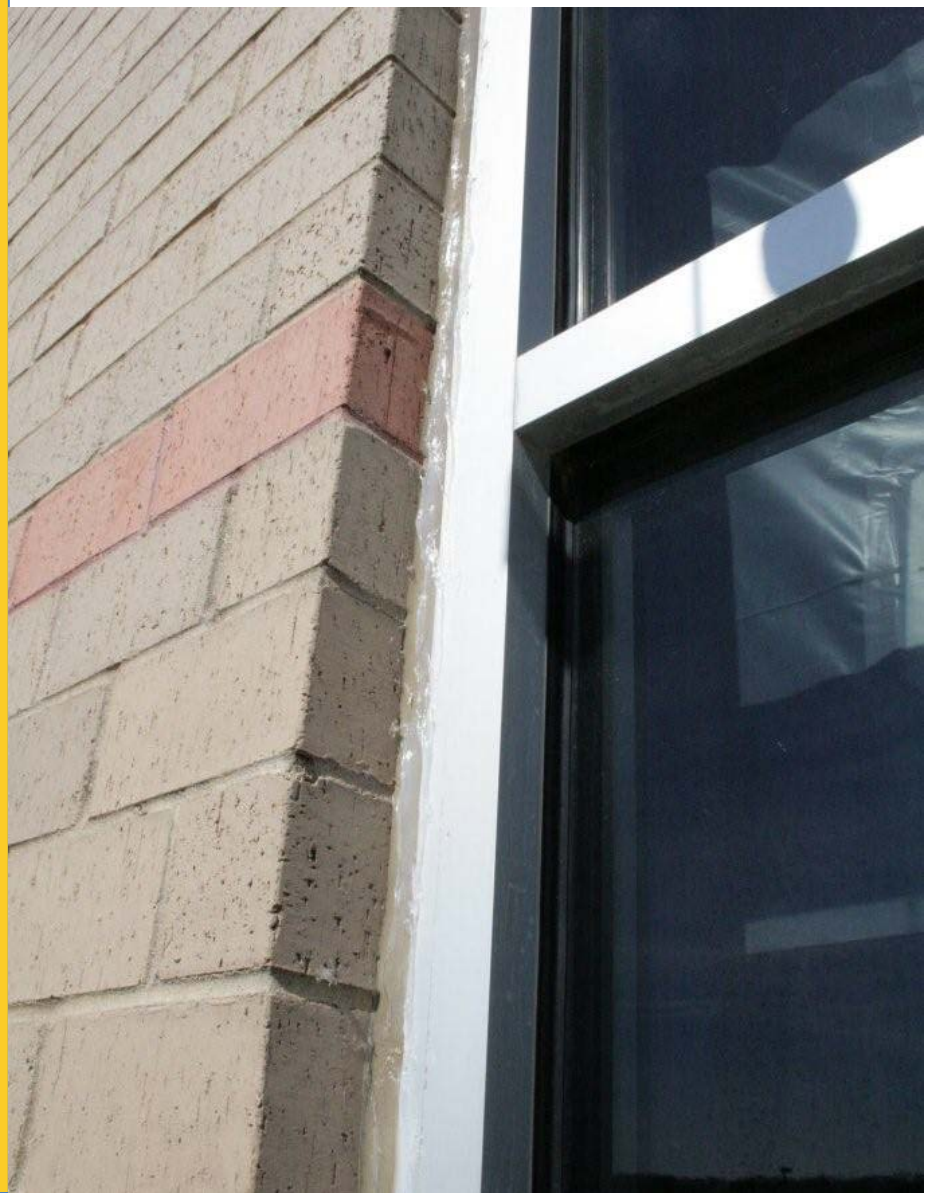

Diagnostic test


Gasp! A non-calibrated nozzle


DELTA-MS


Roof flood test

How to testing Aging?



Design should account for consequences of aging/failing of seals and gaskets

One can always seal to get tight– what happens when the seal fails

How to be sure repeatable

- How many windows can I test
- How many feet or parapet can I test

Rain, Air, Thermal

- Examples were all rain focused
  - Worst practical consequences
- Air and thermal can apply similar philosophy

- Modeling is useful for thermal
- Air testing is most useful on building

- Nothing provides better value than an experienced consultant using their eyes and brain

Back to panel

QA/QC & Commissioning

- Owners Project Requirement
  - Metrics
  - Clarity to team, heads up to builders
- Need to confirm design meets needs
  - Performance beats target?
- Need to confirm design is built
  - Price-performance selection
  - Project-specific testing
- Need to confirm building is operated as intended

Why test?

- Only do a test when the outcome will matter
- E.g. You must have a target
  - Consequences for failure to meet
- Test method must be sufficiently meaningful for the decisions to be made

Where to test?

- Model (perfect control, never real)
- Laboratory (controlled, standardized)
  - Materials
  - Sub-systems
  - Systems / Components
  - Mockups off site
- Jobsite
  - Mockup
  - In-situ (real “ish”)

When to test?

- Before construction
  - On materials in lab as QC
  - On systems in lab during product/system development
  - Ideally before project is conceived or designed
- During construction
  - In field
  - confirm installation quality

Airtightness Testing

- Mockup limited area
- Hard to wait for whole building
  - Keep the air-water barrier exposed till tested