air barrier
abaa
association of america

CONFERENCE & TRADE SHOW

MAY 8-9 2018
SALT LAKE CITY

AIR BARRIER EDUCATION TRACKS FOR THE CONSTRUCTION INDUSTRY

We met at the parapet…

and it was transition at first sight

Christine Cronin, Building Science Corporation

Air Barrier Association of America (ABAA) is a Registered Provider with The American Institute of Architects Continuing Education Systems. Credit earned on completion of this program will be reported to CES Records for AIA members. Certificates of Completion for non-AIA members are available on request.

This program is registered with the AIA/CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

air barrier
abaa
association of
america

CONTINUING EDUCATION
AIA

AIA learning objectives

1. Identify the role that roof-to-wall, wall-to-foundation, and wall-to-disparate material transitions play in achieving a tight building envelope and what contributes to failure.
2. Discuss the stages in the design process where transitions should be considered and what should be detailed.
3. Review the states of moisture, their movement and how it impacts the roof-to-wall, wall-to-foundation and wall-to-disparate materials, including the impact of vapor drive on interior spaces.
4. Describe the considerations in material performance with respect to installation techniques, air and water barriers, and vapor permeability and the impact on transition joints.

air barrier
abaa
association of
america

what do we want to do?

- avoid problems
  - usually water related

} water control

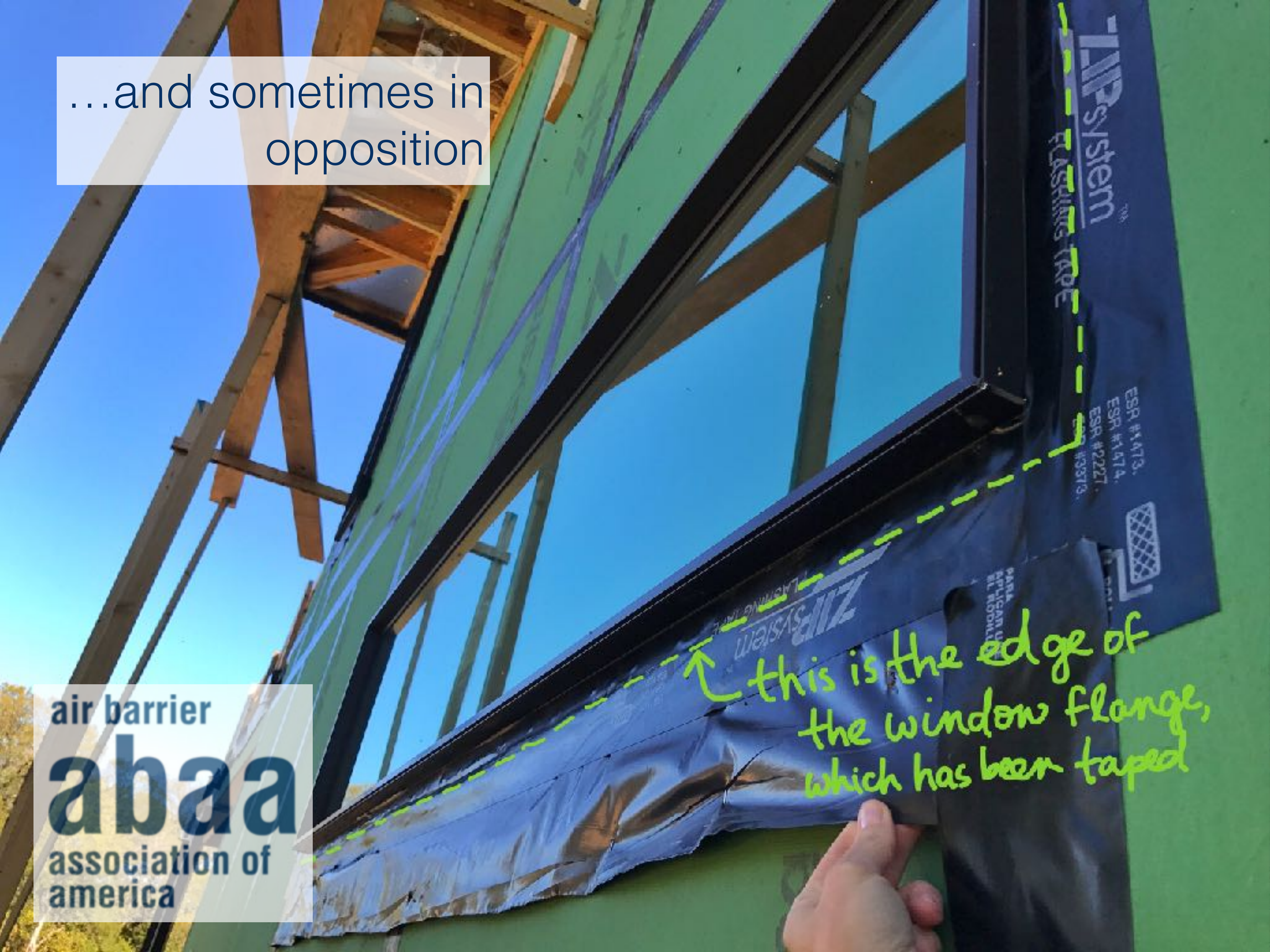
+ make performance improvements
  - IAQ
  - thermal comfort
  - energy efficiency
  - acoustic
  - pest control

} air control

air barrier
abaa
association of america


air control and water control
sometimes work in concert…
EXIT
corrosion @
fasteners
air barrier
abaa
association of
america

…and sometimes in opposition



air barrier
abaa
association of
america

We are often so worried about introducing new failures that we improperly conclude that it's best not to even attempt to make performance improvements.

why is this an improper conclusion?

a. It’s unrealistic

With code changes leaky enclosures will no longer sufficiently compensate for poor water management

b. It’s based on the faulty assumption that enclosure improvements are necessarily at odds with water management

They don’t have to be.

c. It’s an excuse to justify lazy design and lazy construction

Don’t be lazy.

avoiding problems

- drainage, drainage, drainage
- no seriously, drainage:
  - sloped sites
  - sloped roofs with overhangs
  - drained and back-vented claddings

air barrier
abaa
association of america

improving performance

- air control, air control, air control

- no seriously, air control:
  - provide an air barrier in each enclosure assembly (slab, walls, roofs)
  - detail for continuity at transitions: wall-to-slab, wall-to-glazing, wall-to-roof
  - account for odd conditions: soffits, canopies, overhangs, parapets

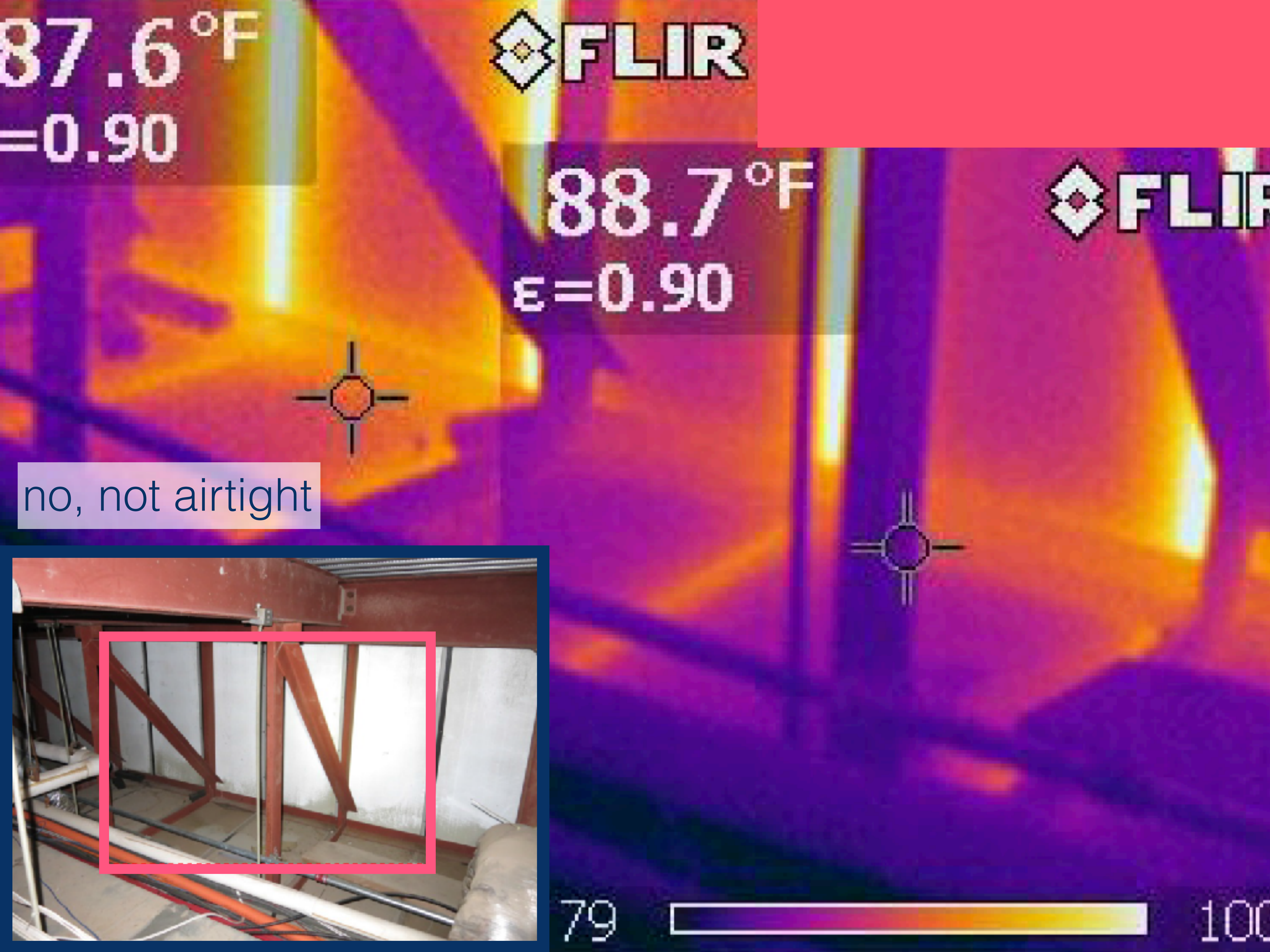
air barrier
abaa
association of america

are panel joints airtight?

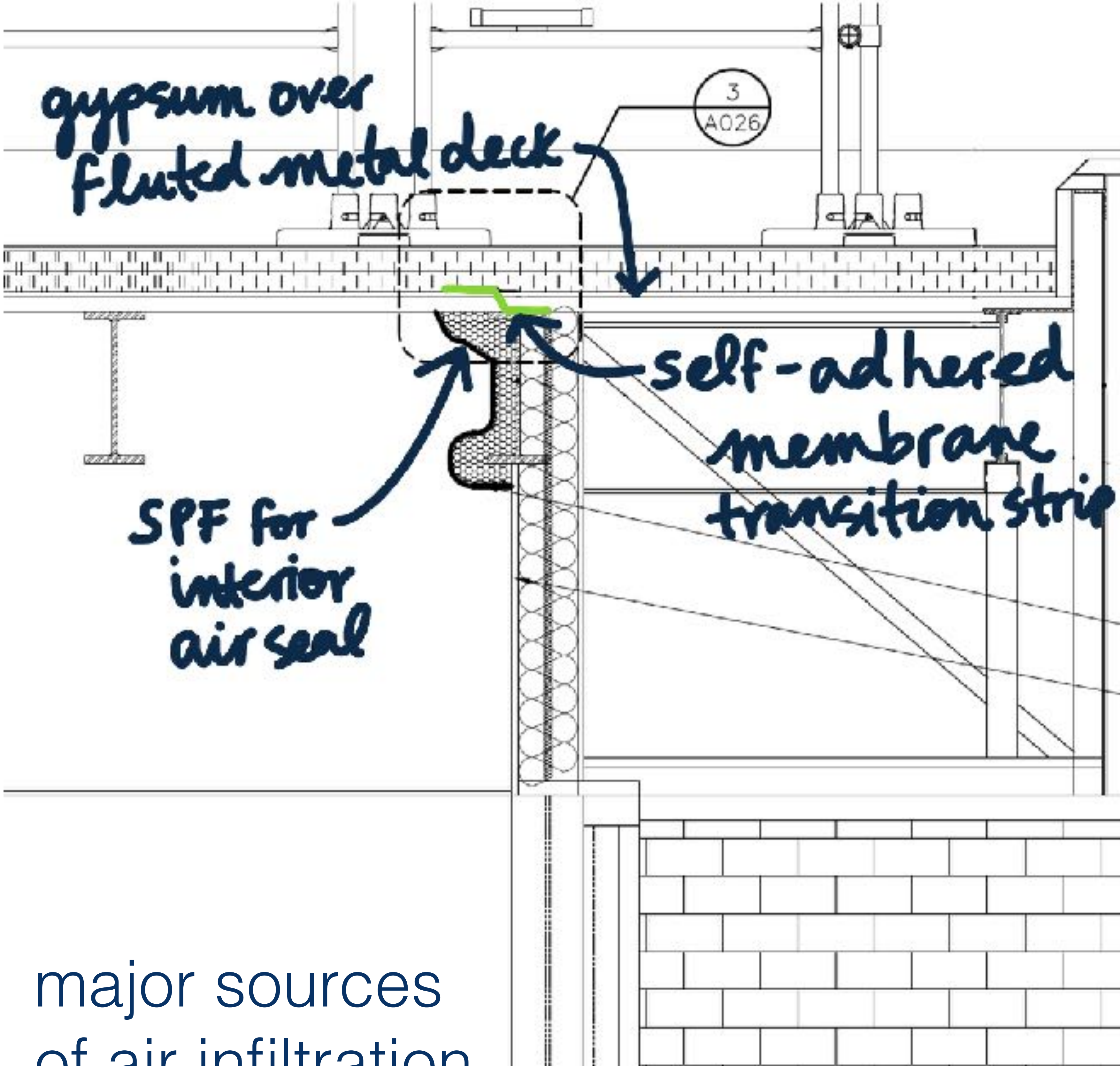
major sources of air infiltration

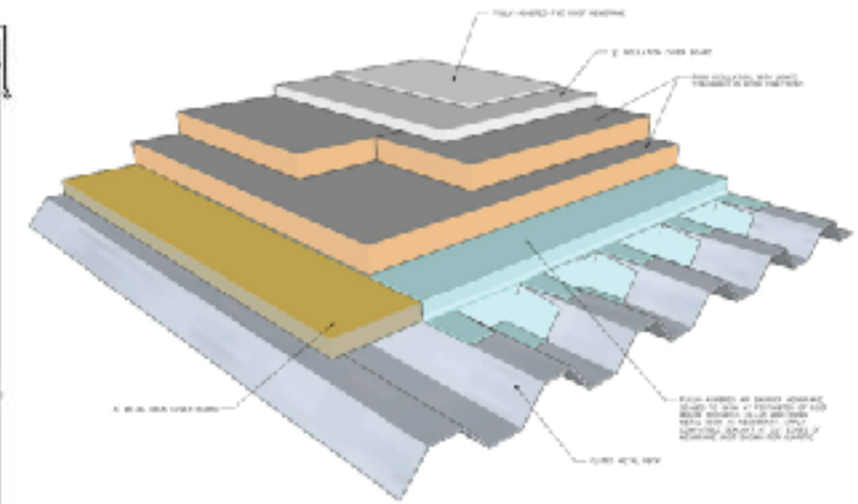
- soffits
- canopies
- slab-to-wall
- wall-to-roof (parapets)
- wall-to-glazing

air barrier abaa association of america



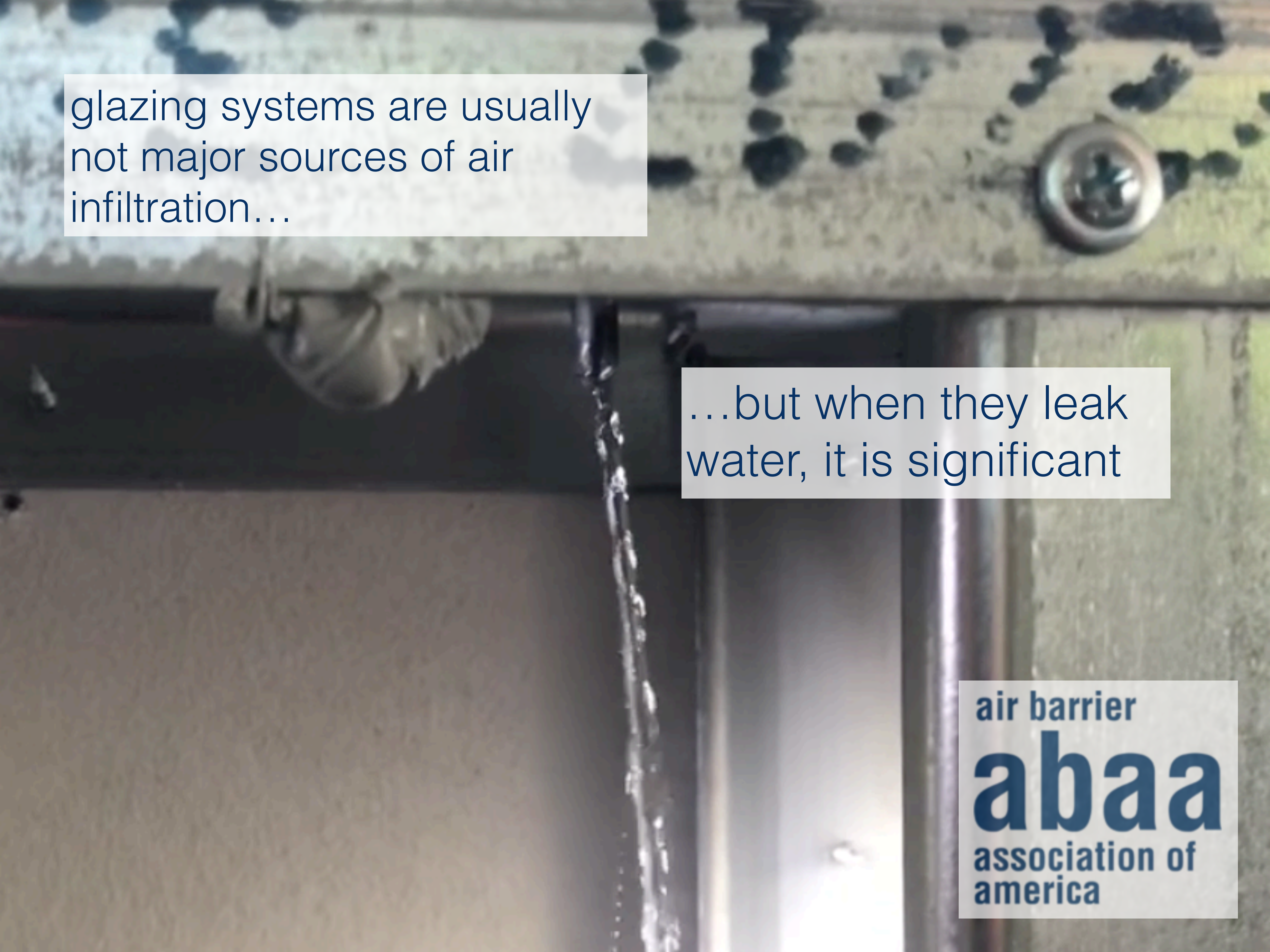
no, not airtight





air barrier
abaa
association of
america

major sources
of air infiltration


glazing systems are usually not major sources of air infiltration…
…but when they leak water, it is significant
air barrier
abaa
association of america

glazing system detailing

- reduce the load
  - head flashings, overhangs, drips, kerfs
  - isolate the window from the wall cavity
- connect the control layers
  - water control at window to water control at wall
  - air control at window to air control at wall
  - thermal control at window to thermal control at wall
- assume imperfection
  - provide redundancy
  - provide drainage

air barrier
abaa
association of america

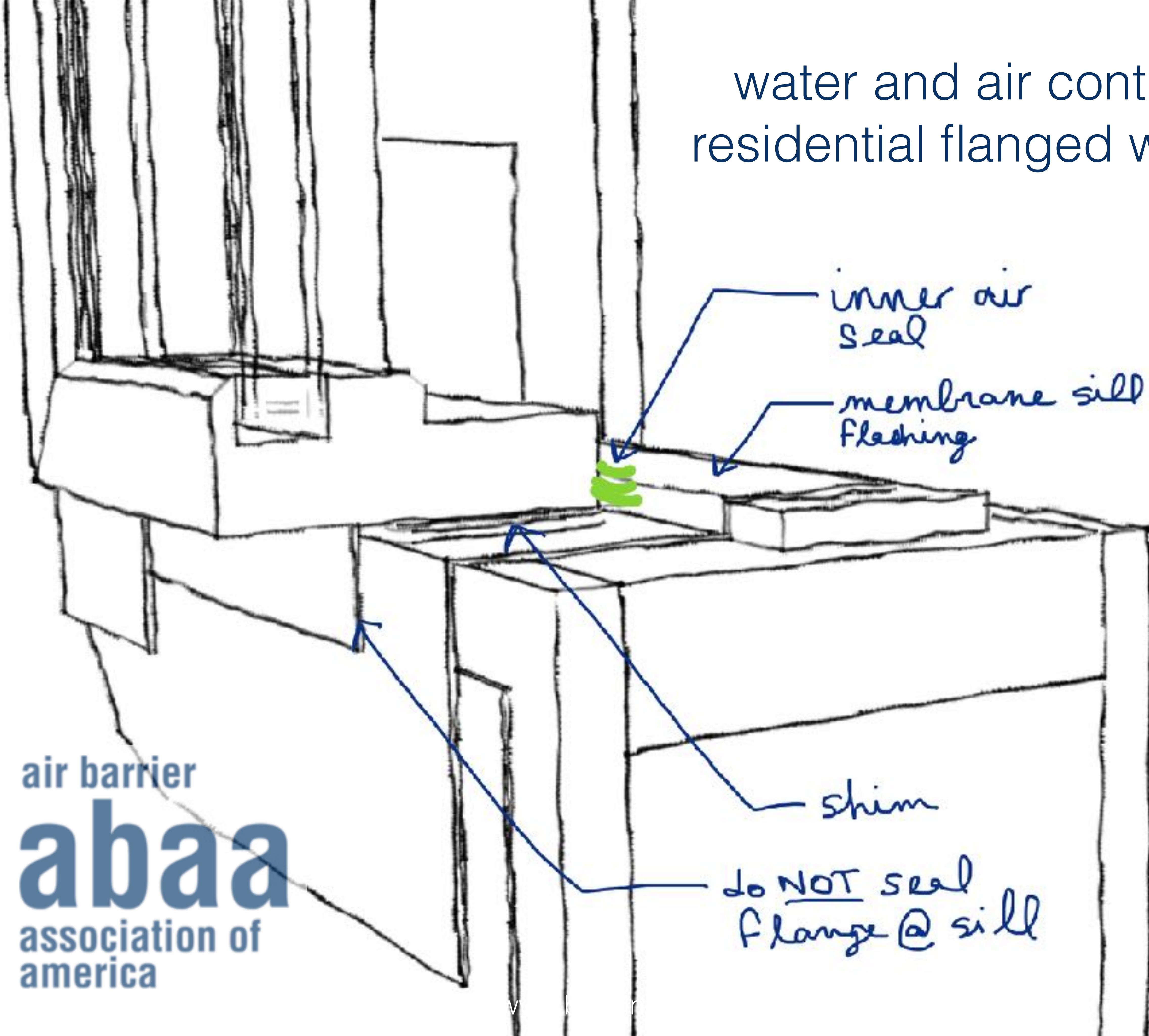
what do you need to know?

- reduce the load
  - head flashings, overhangs, drips, kerfs
  - isolate the window from the wall cavity
- connect the control layers
  - water control at window to water control at wall
  - air control at window to air control at wall
  - thermal control at window to thermal control at wall
- assume imperfection
  - provide redundancy
  - provide drainage

- how is the window supported?
- where do I want it to sit within the rough opening?
- what are the control layers in the adjacent construction?
- how is the glazing system designed to drain?

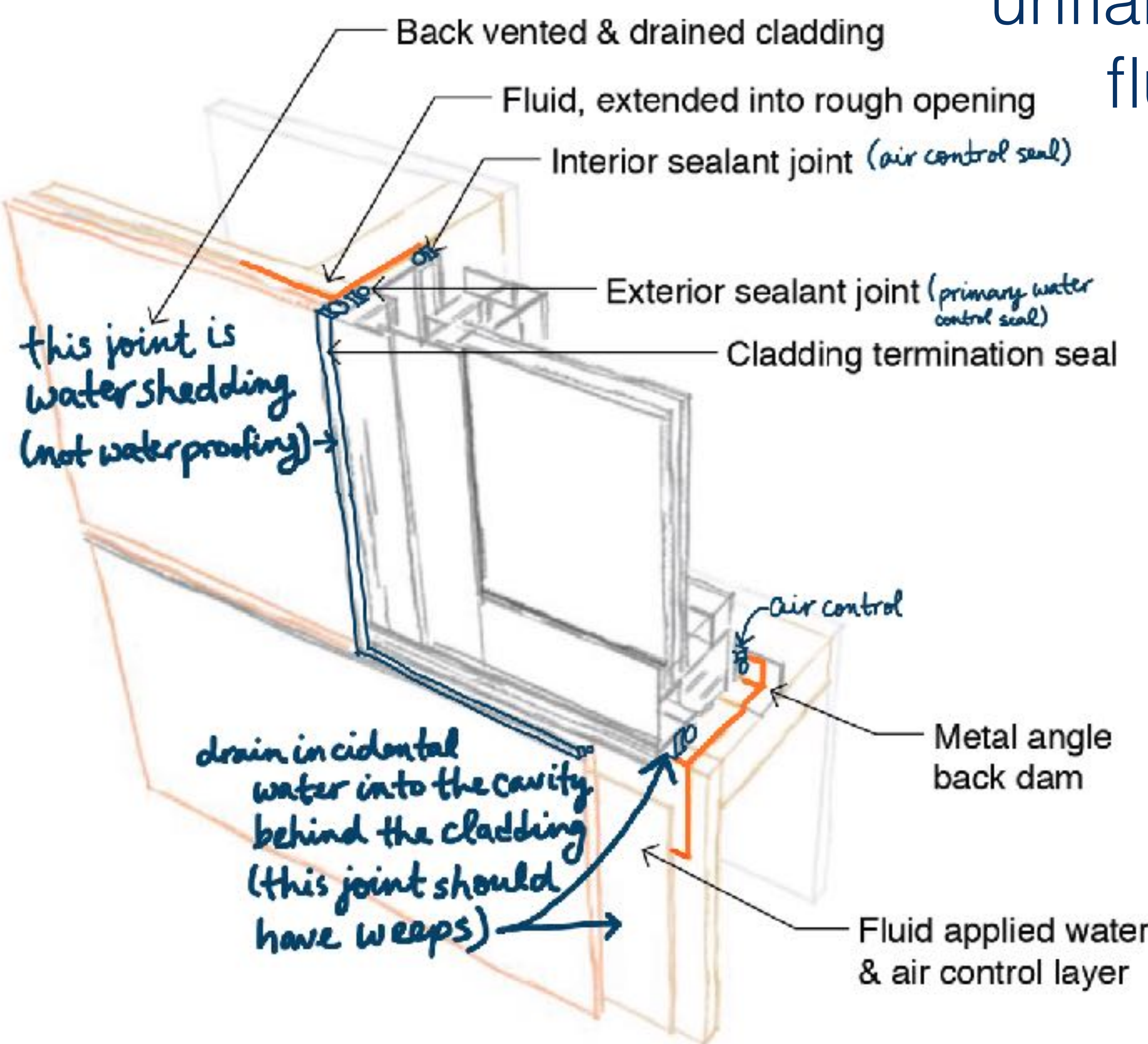
air barrier association of america

water and air control at a residential flanged window



air barrier
abaa
association of america

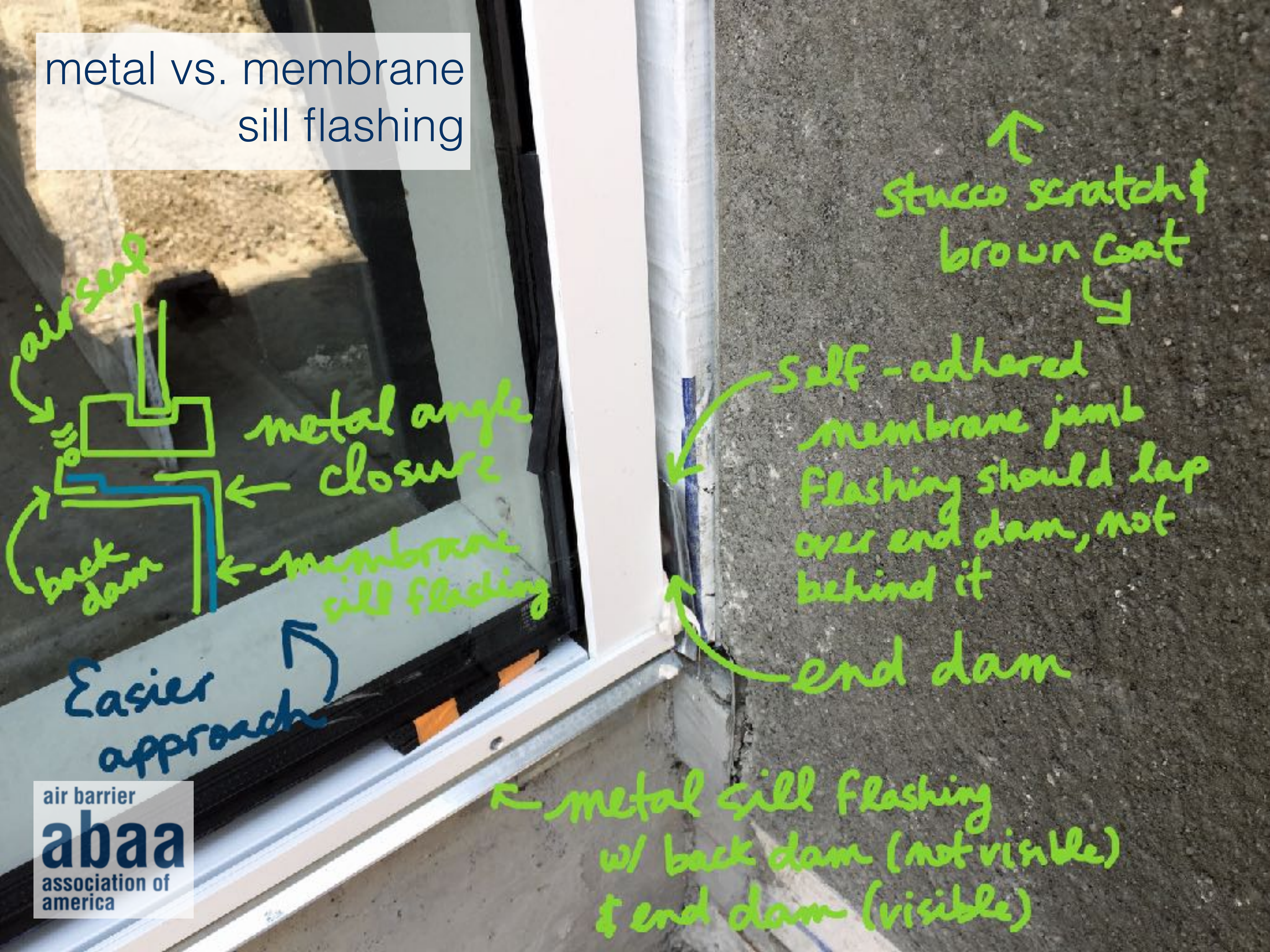
unflanged window - flush installation



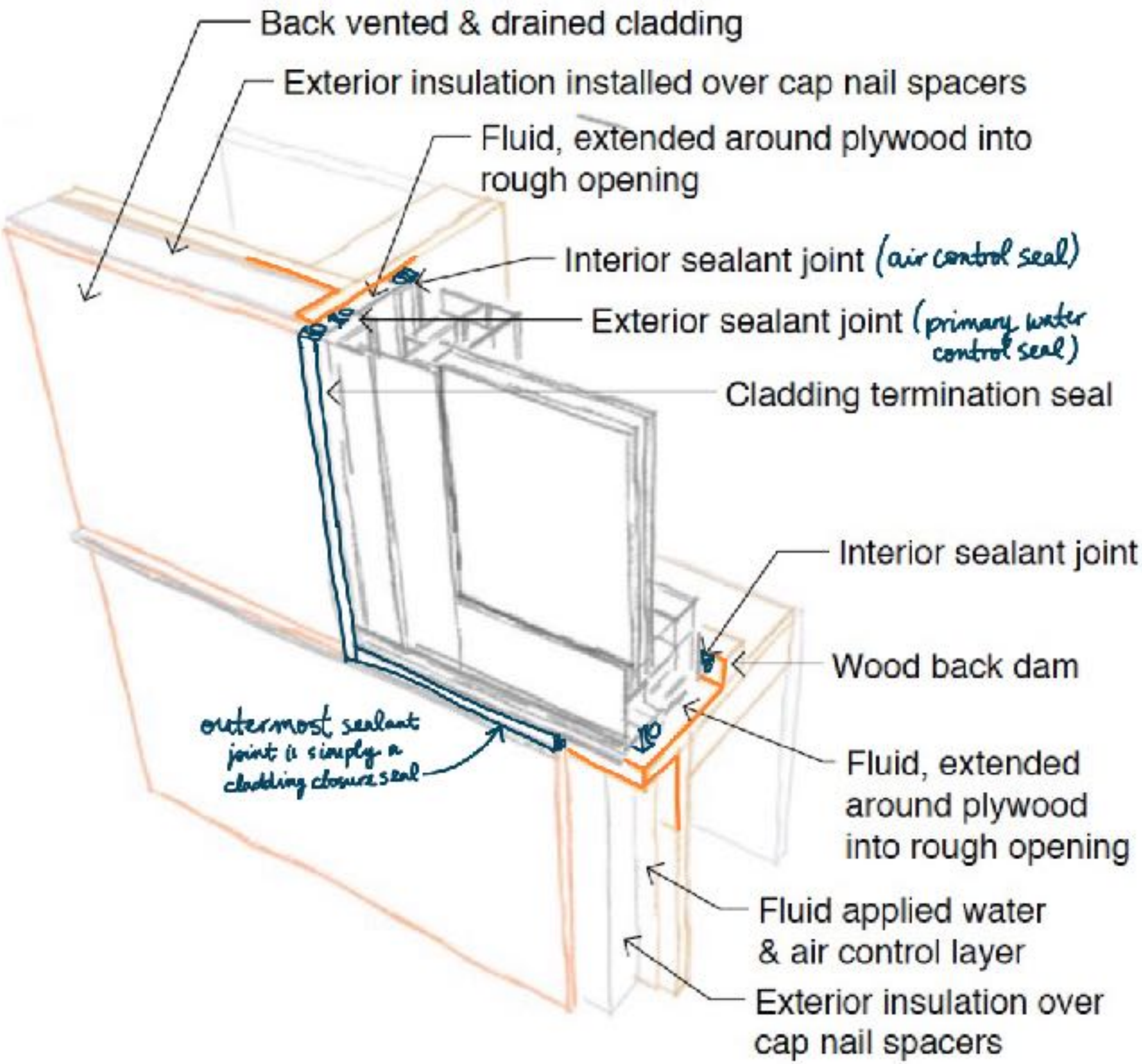
air barrier association of america


unflanged window -
flush installation
Dens Element
GP
Georgia-Pacific
air barrier
abaa
association of
america

metal vs. membrane sill flashing

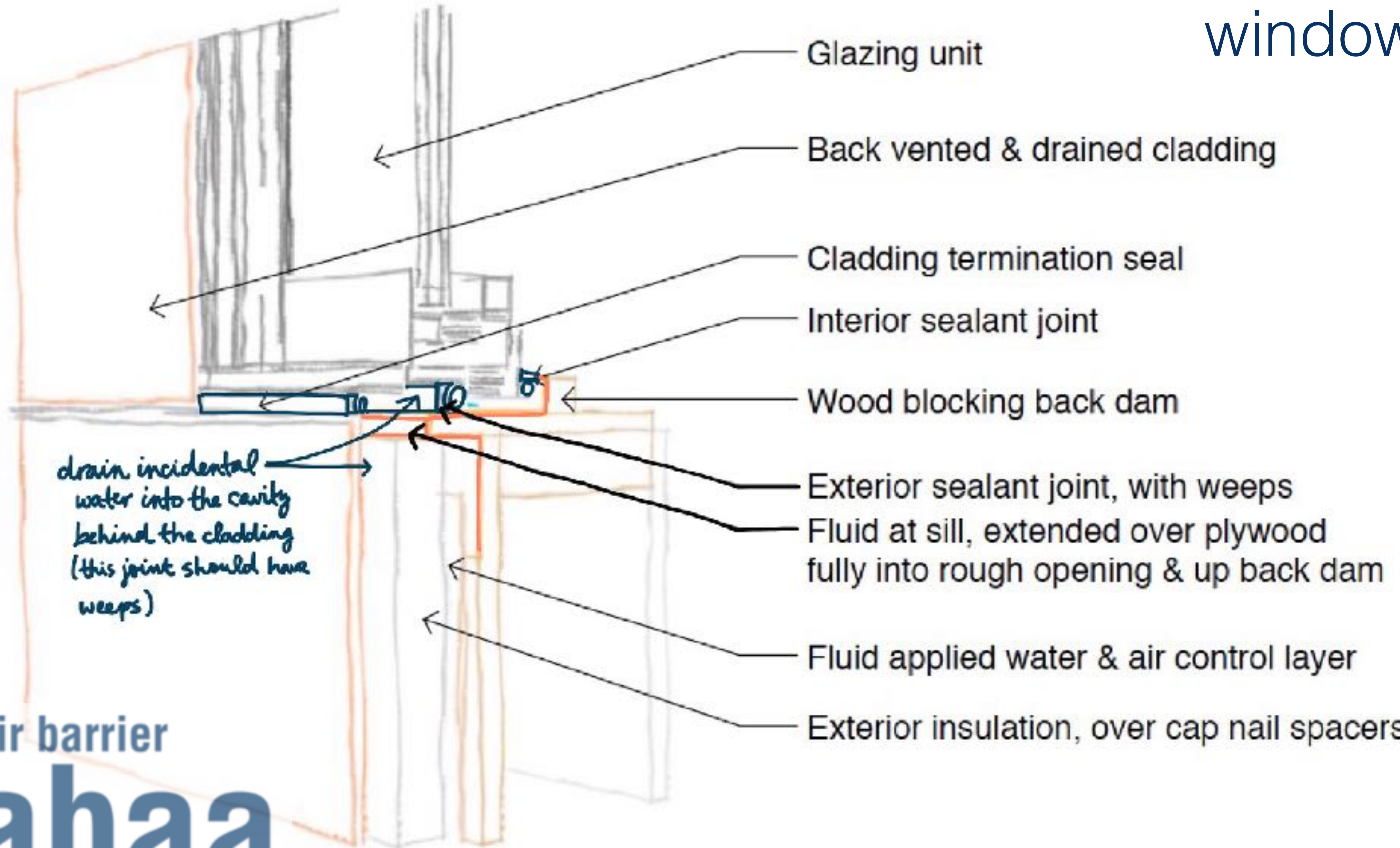


residential unflanged window



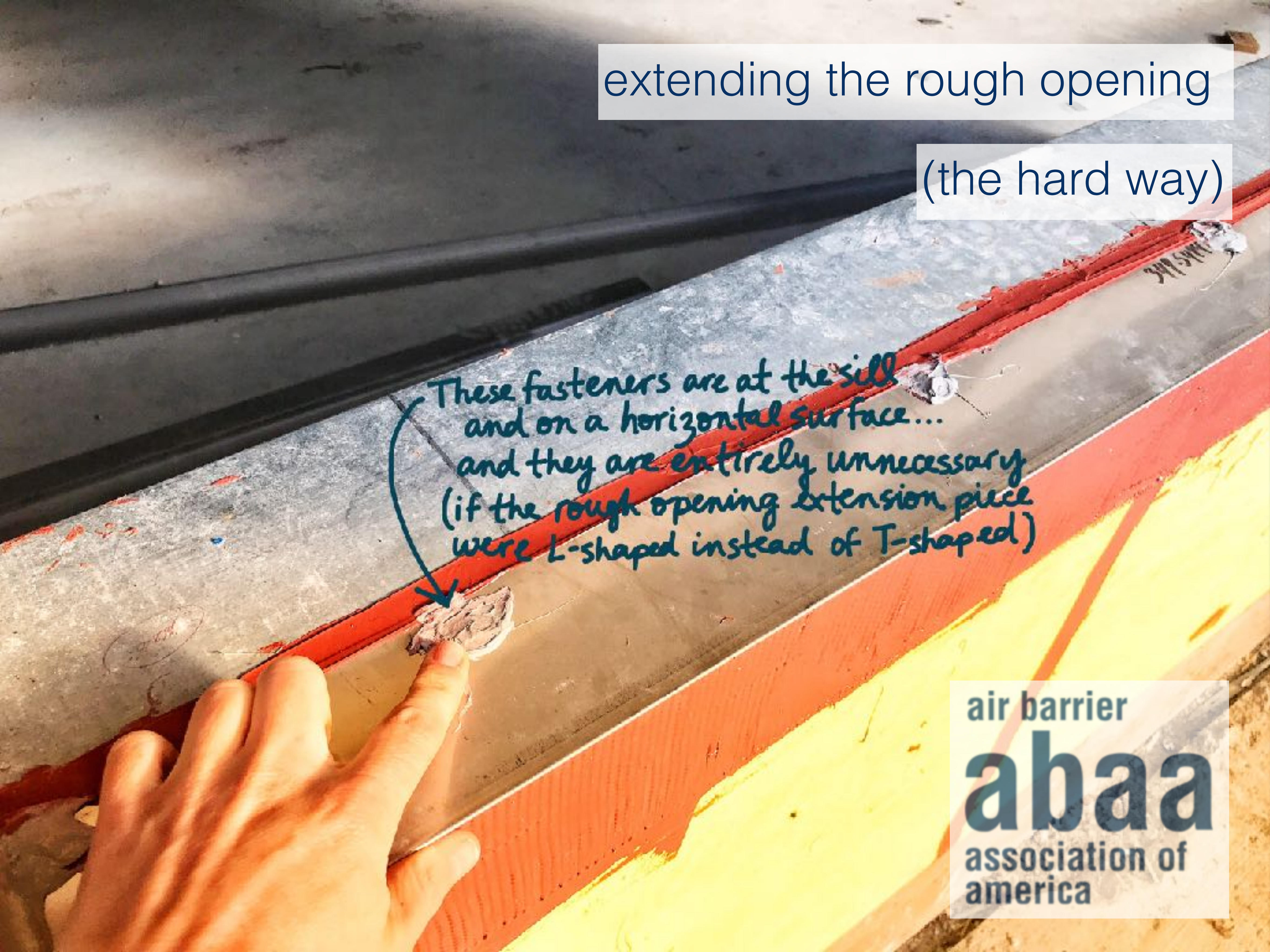
air barrier
abaa
association of america

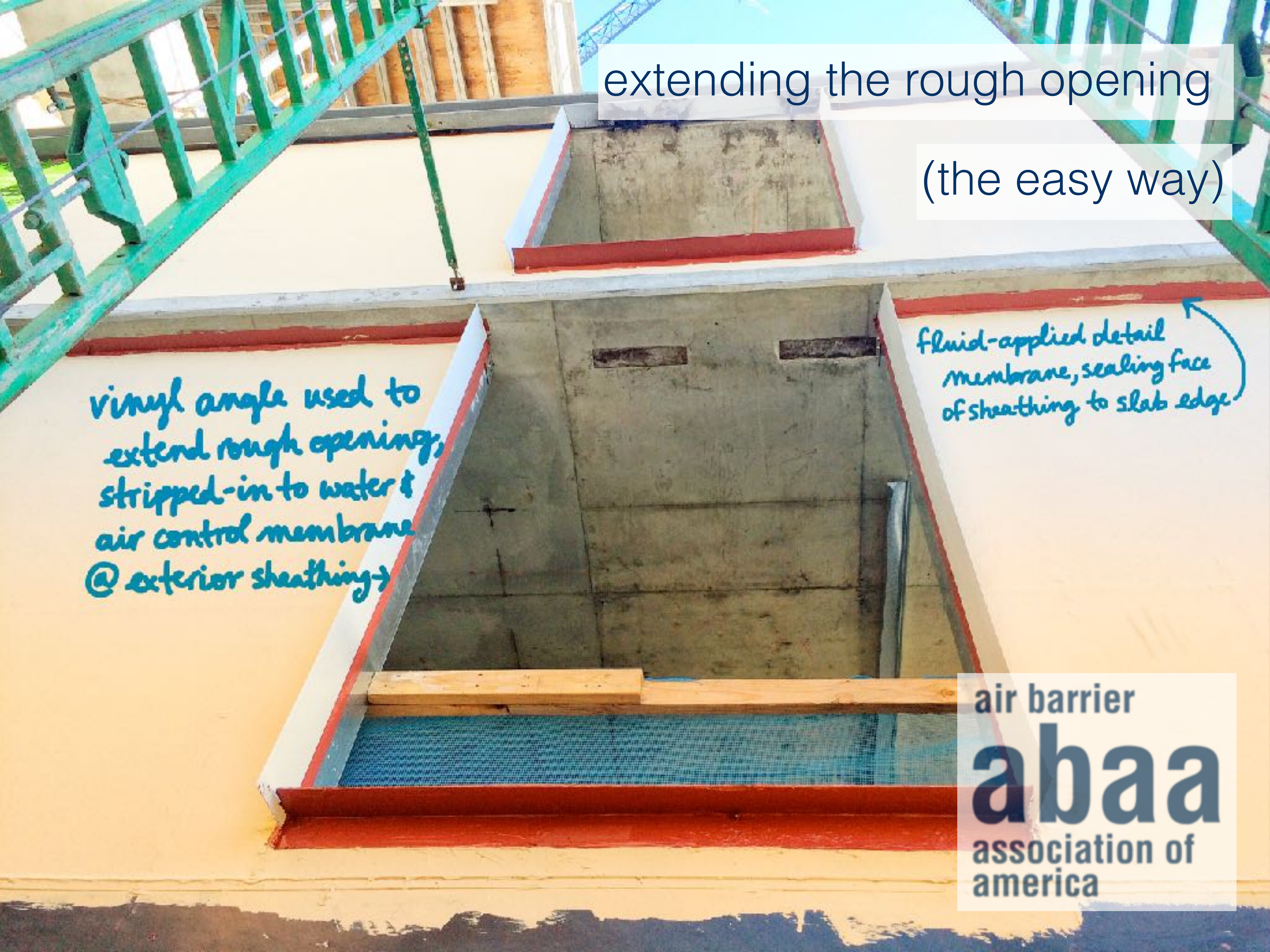
residential unflanged window

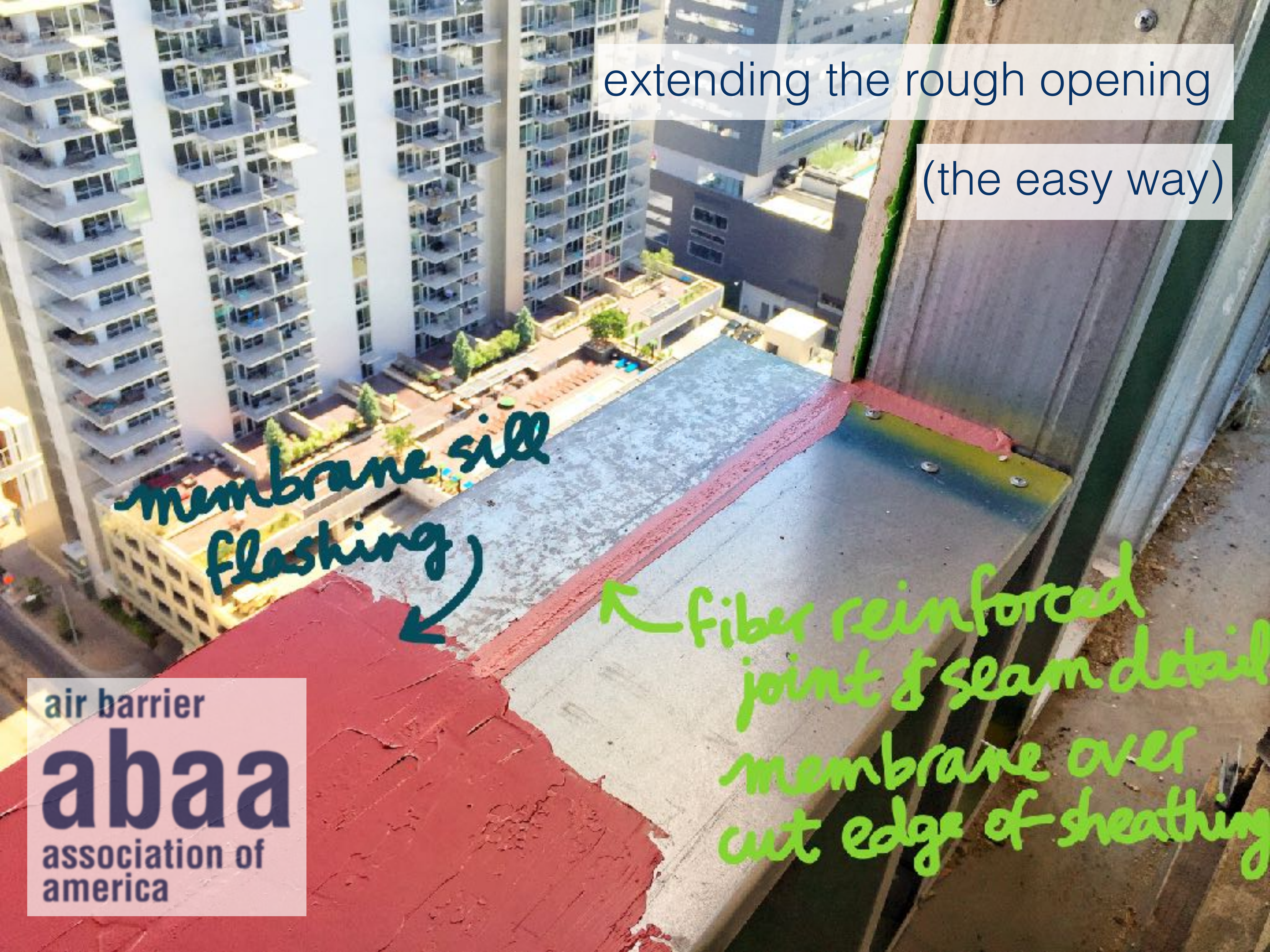


air barrier association of america


extending the rough opening
(the hard way)
Needlessly complicated
T-shaped rough opening
extension piece
metal framing
fastener
T-shape
sheathing
complicated
vs.
framing @ rough opening
L-extension
sheathing
easy
air barrier
abaa
association of
america


extending the rough opening
(the hard way)
These fasteners are at the sill
and on a horizontal surface...
and they are entirely unnecessary
(if the rough opening extension piece
were L-shaped instead of T-shaped)
air barrier
abaa
association of
america

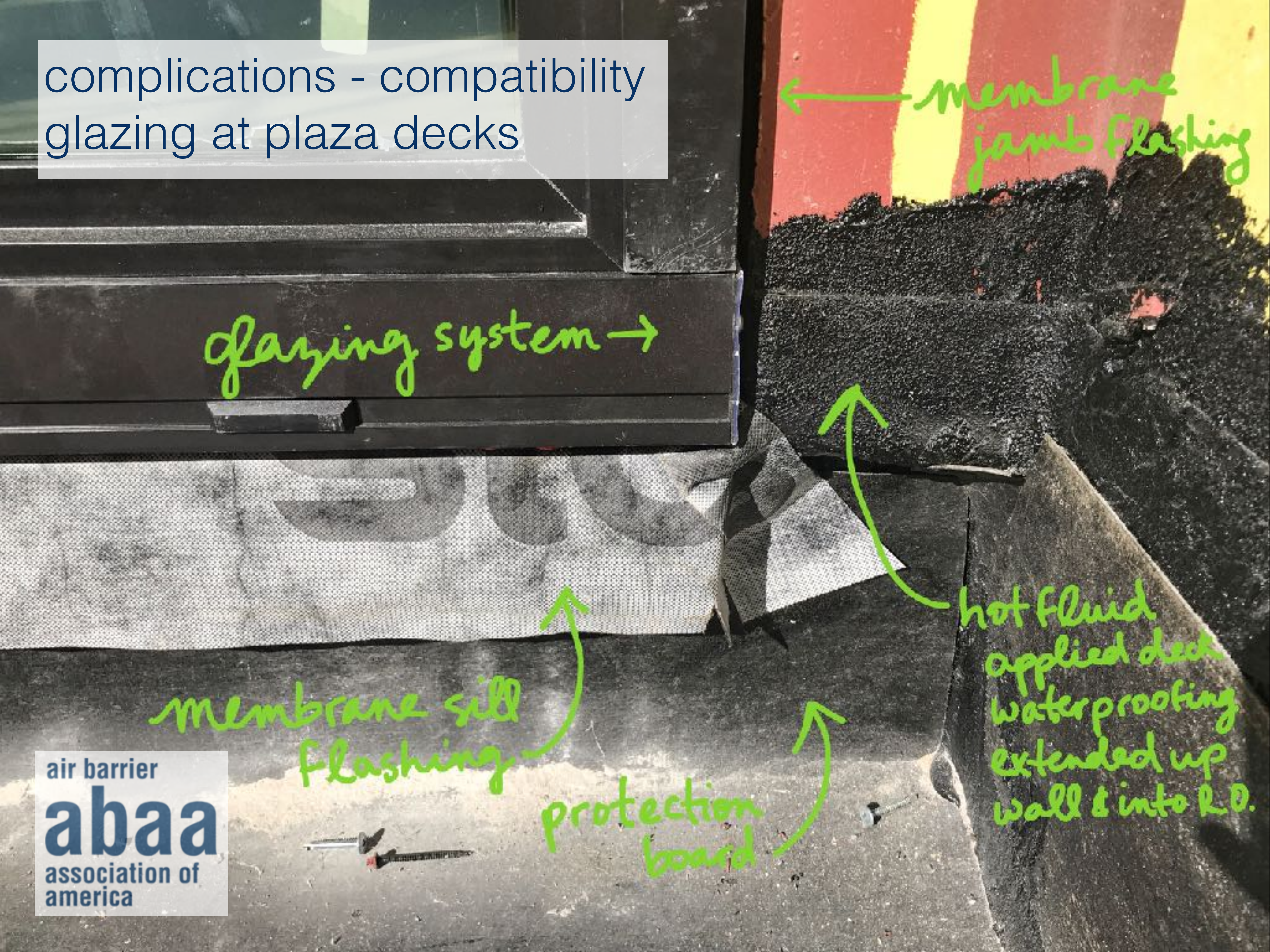

extending the rough opening
(the easy way)
vinyl angle used to extend rough opening, stripped-in to water & air control membrane @ exterior sheathing →
fluid-applied detail membrane, sealing face of sheathing to slab edge
air barrier
abaa
association of america


extending the rough opening
(the easy way)
membrane sill flashing
fiber reinforced joint & seam detail
membrane over cut edge of sheathing
air barrier
abaa
association of america

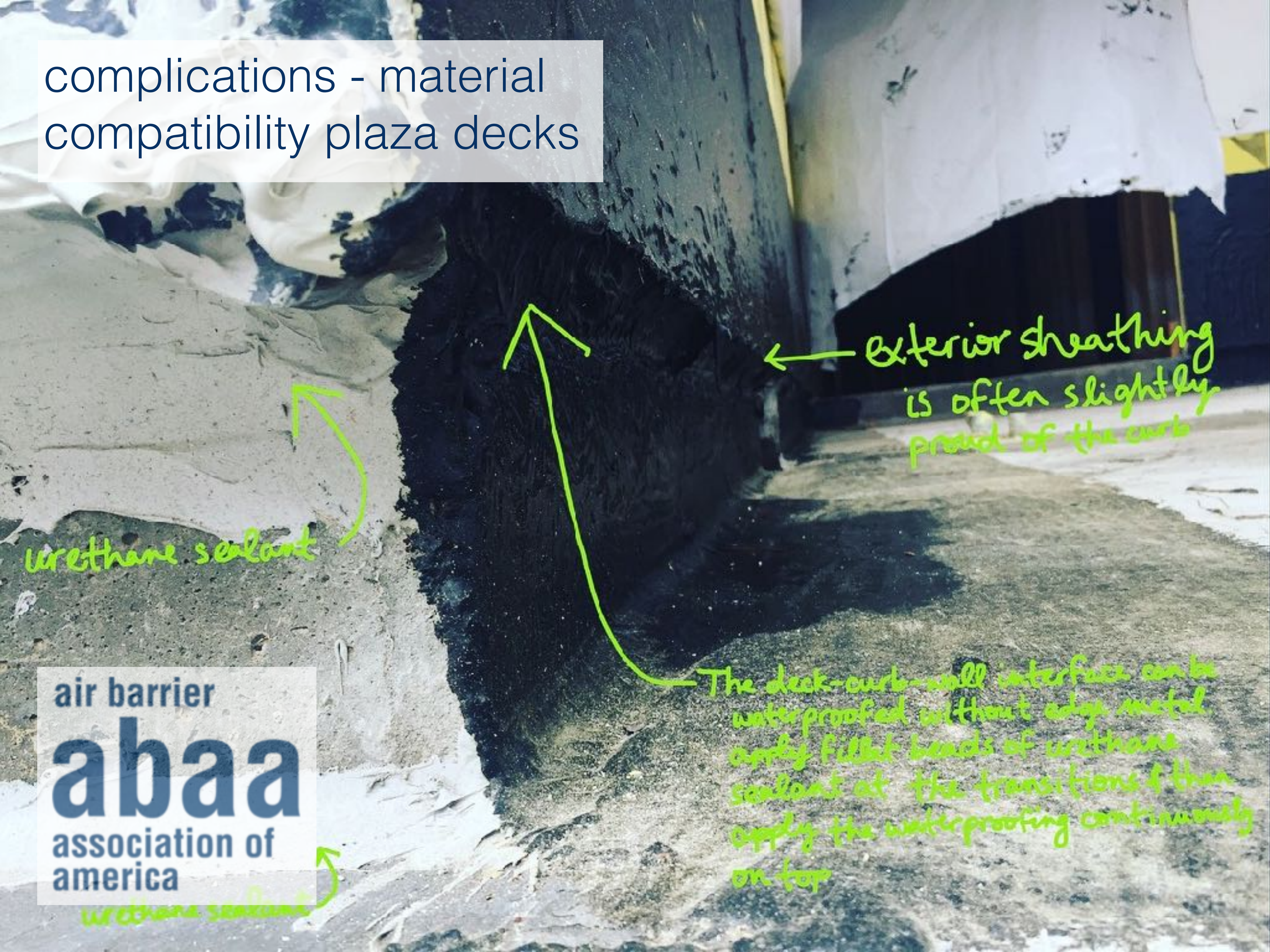
missed opportunities

complications - building setbacks

complications - compatibility
glazing at plaza decks

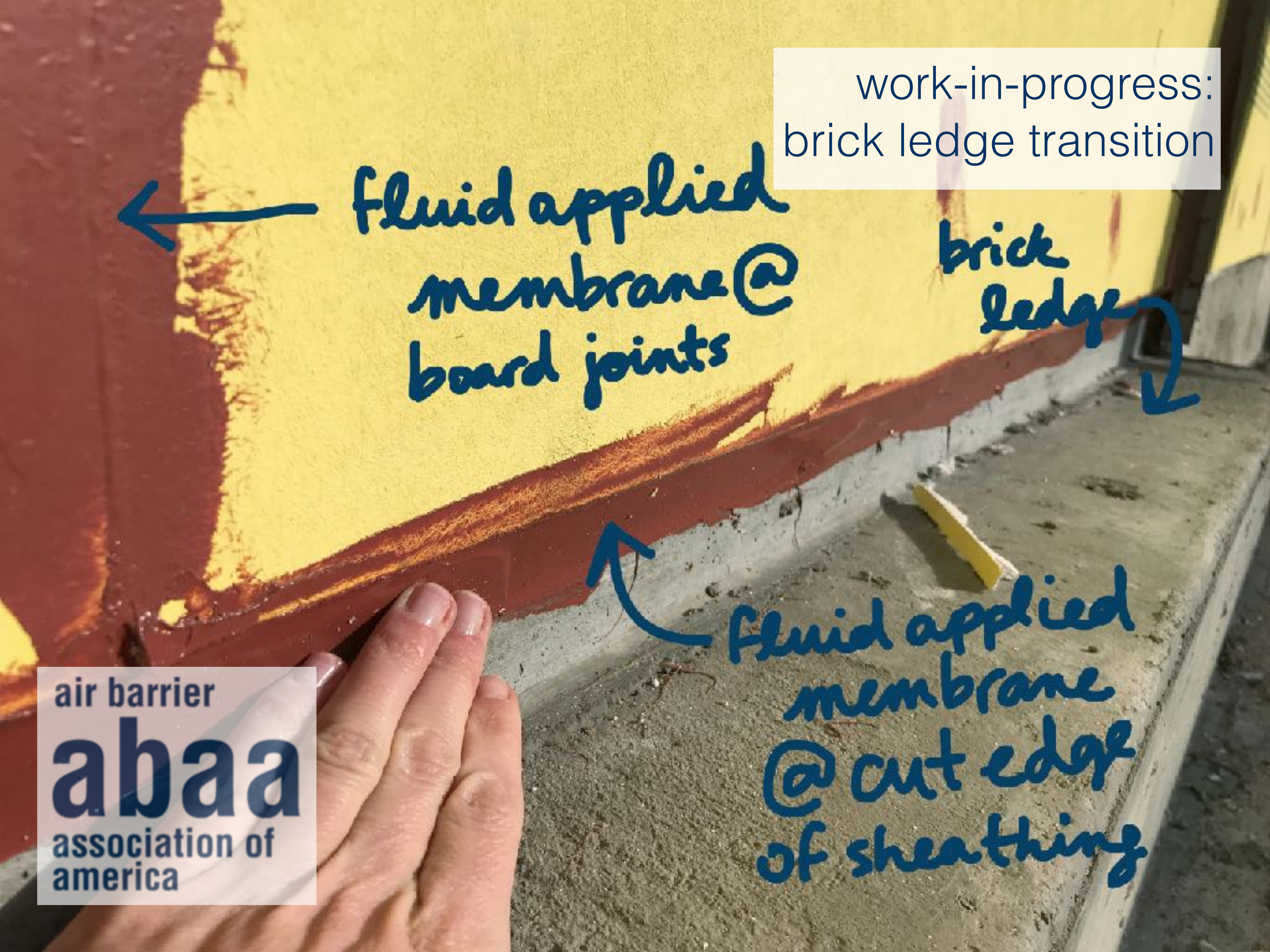


complications - material compatibility plaza decks



air barrier association of america

work-in-progress: brick ledge transition

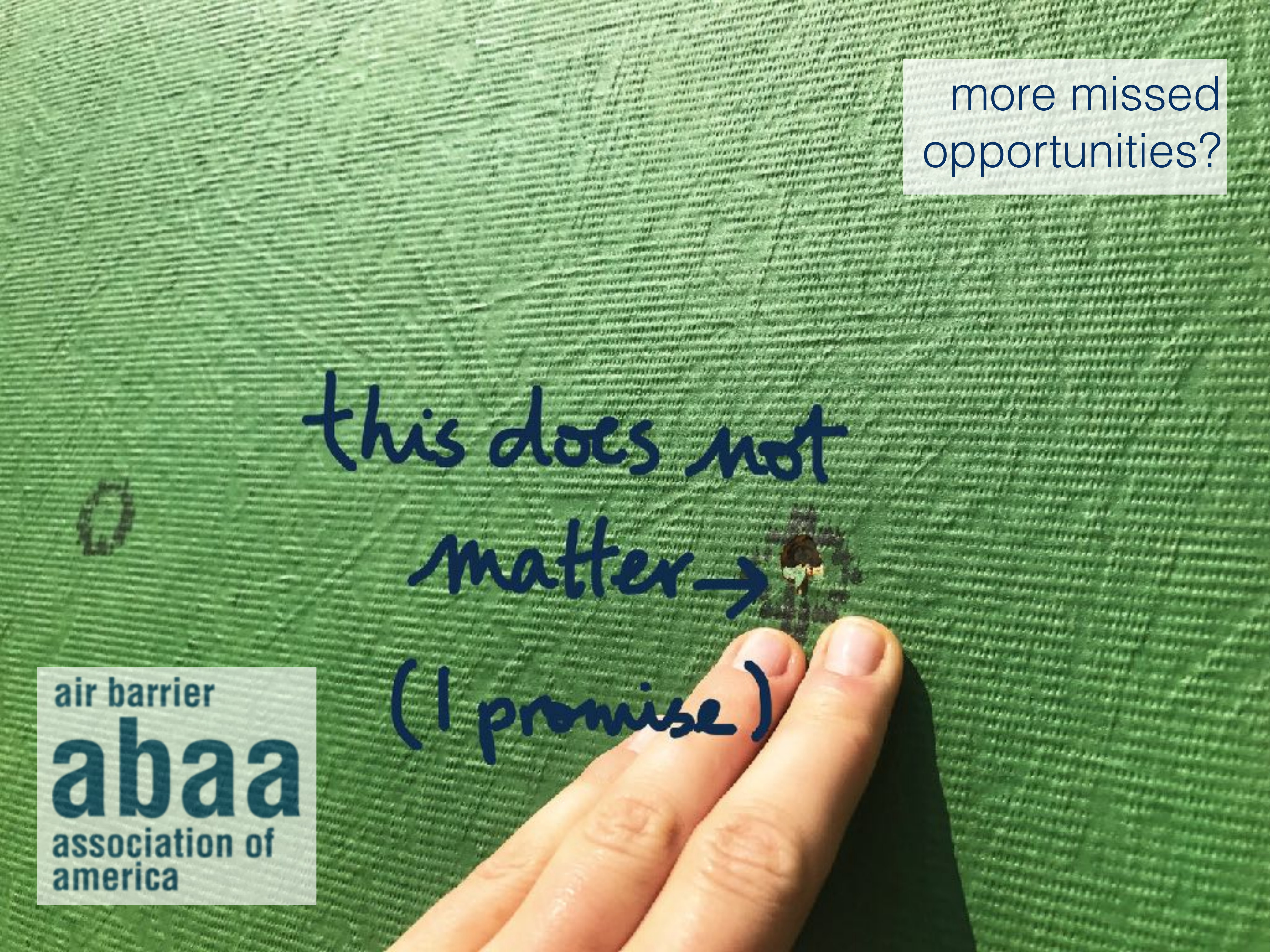


air barrier
abaa
association of america

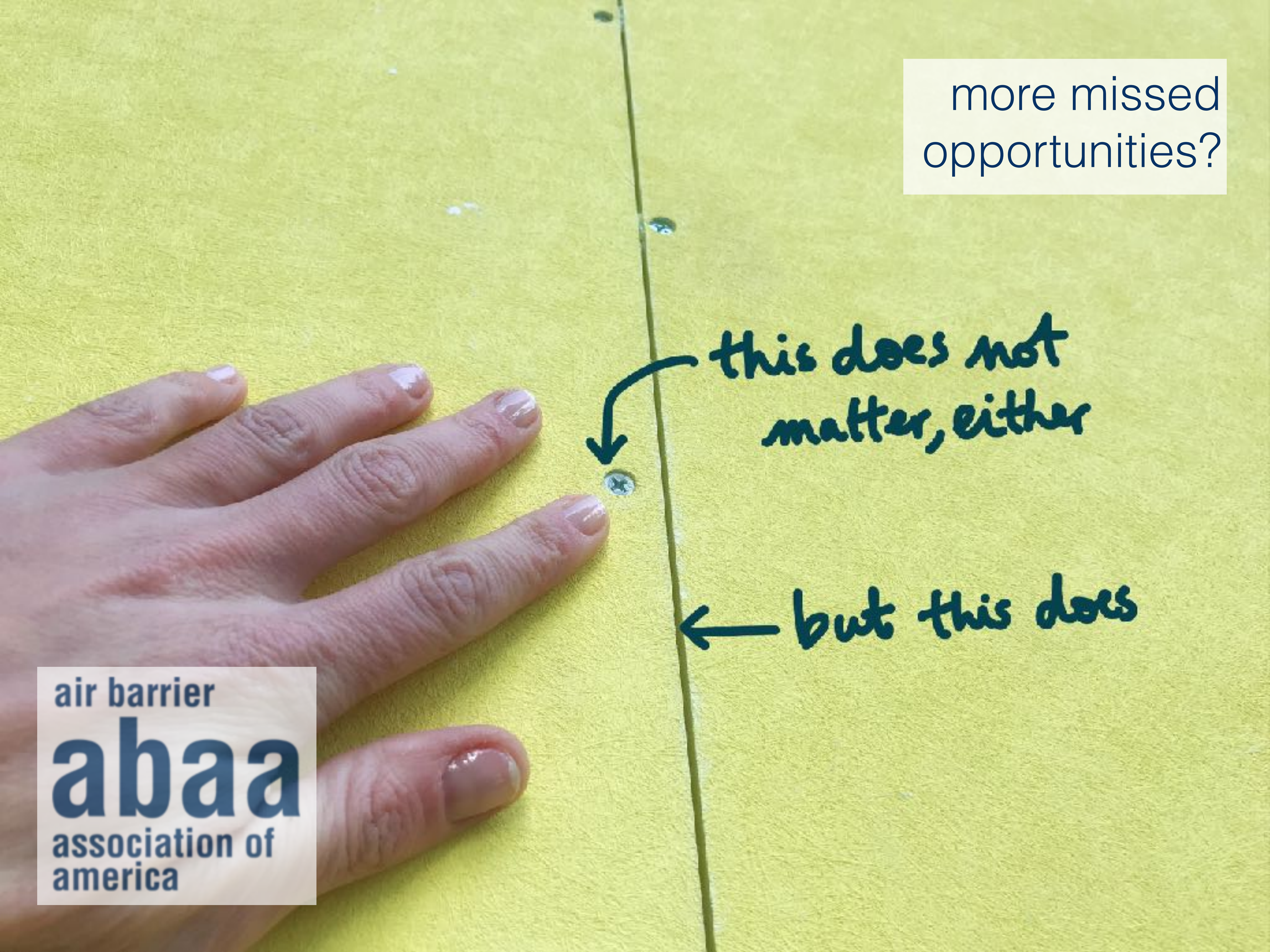
missed opportunities

air barrier association of america

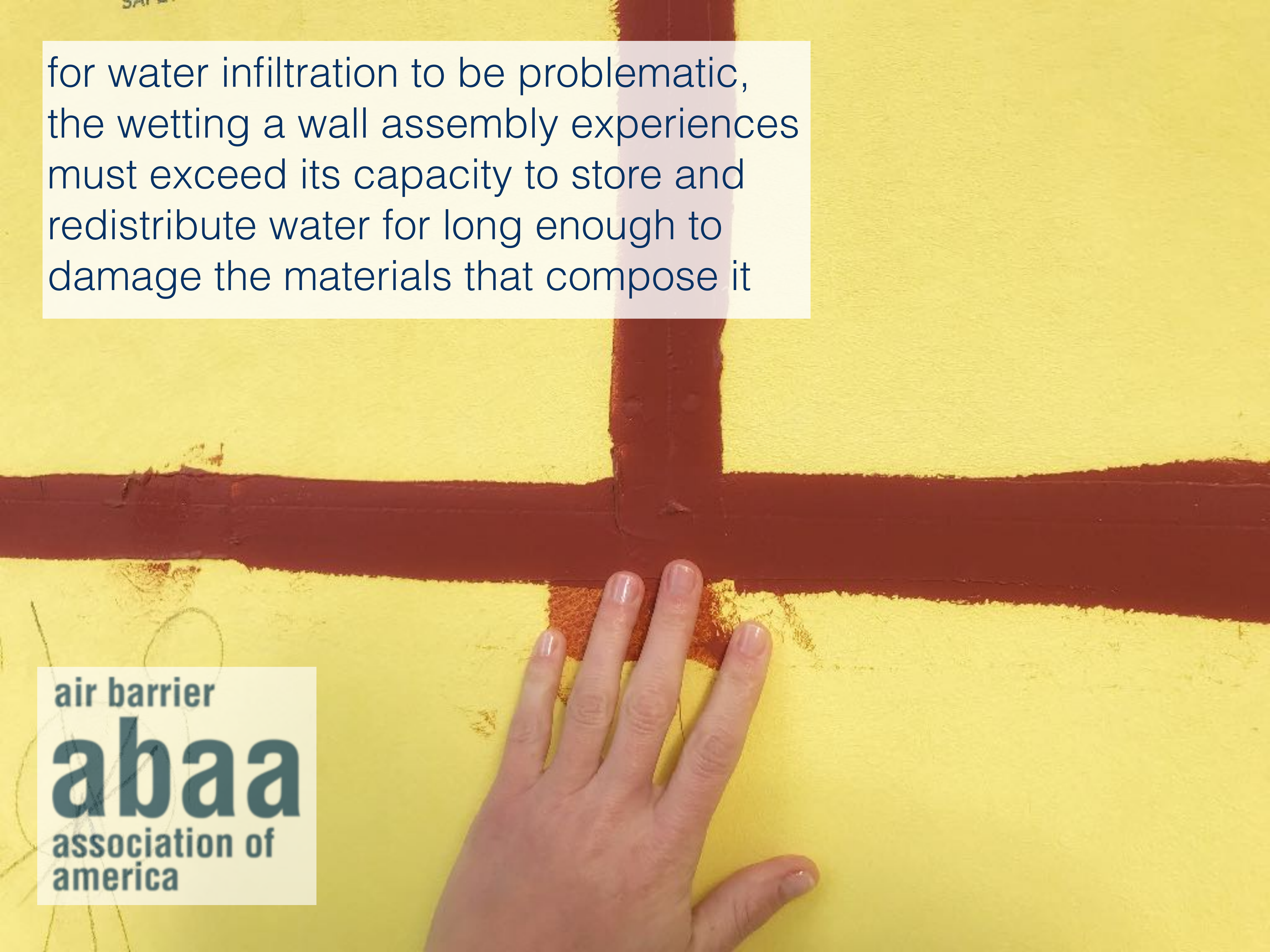
more missed opportunities?



more missed opportunities?



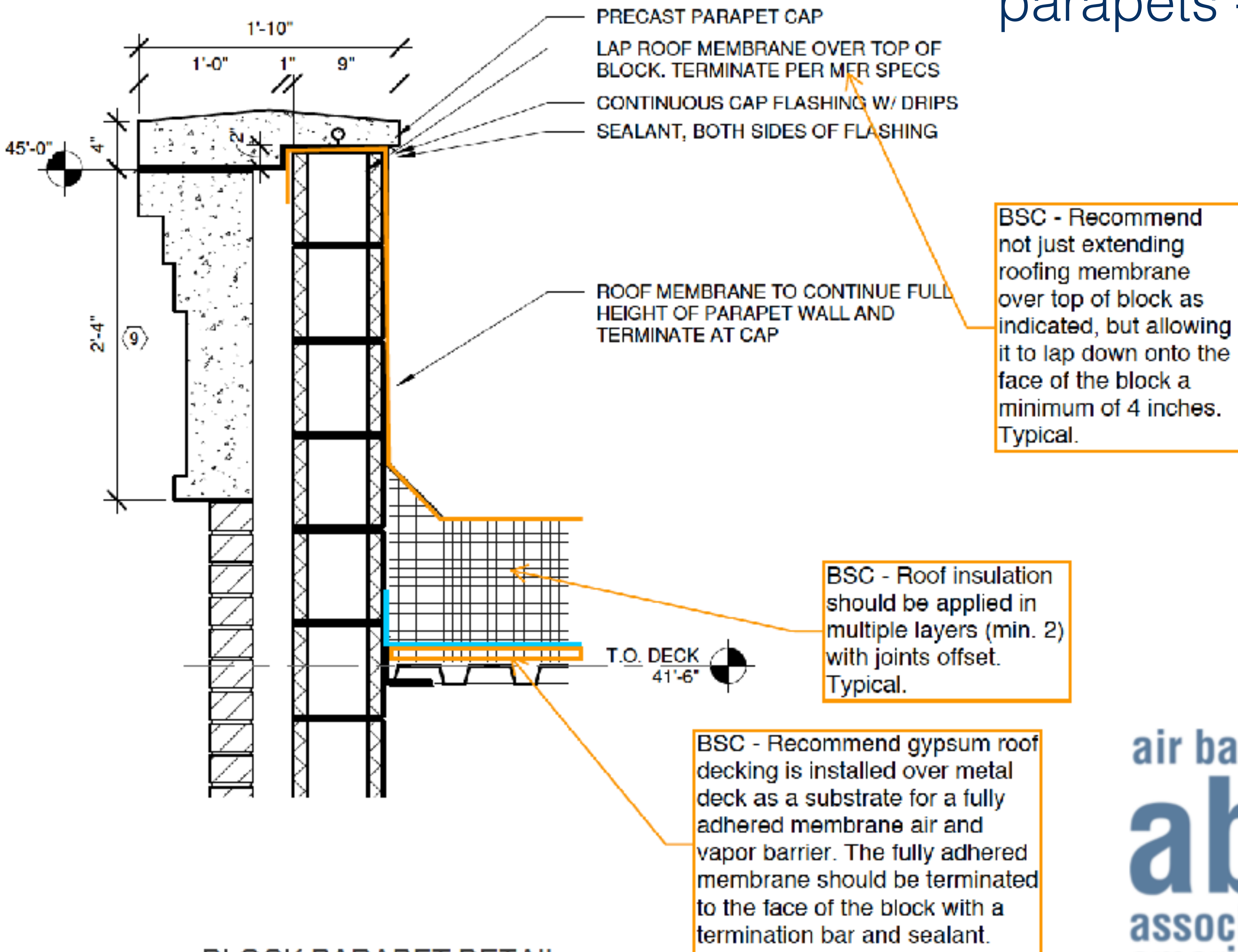
for water infiltration to be problematic, the wetting a wall assembly experiences must exceed its capacity to store and redistribute water for long enough to damage the materials that compose it



air barrier
abaa
association of
america


does this matter?
air barrier
abaa
association of
america

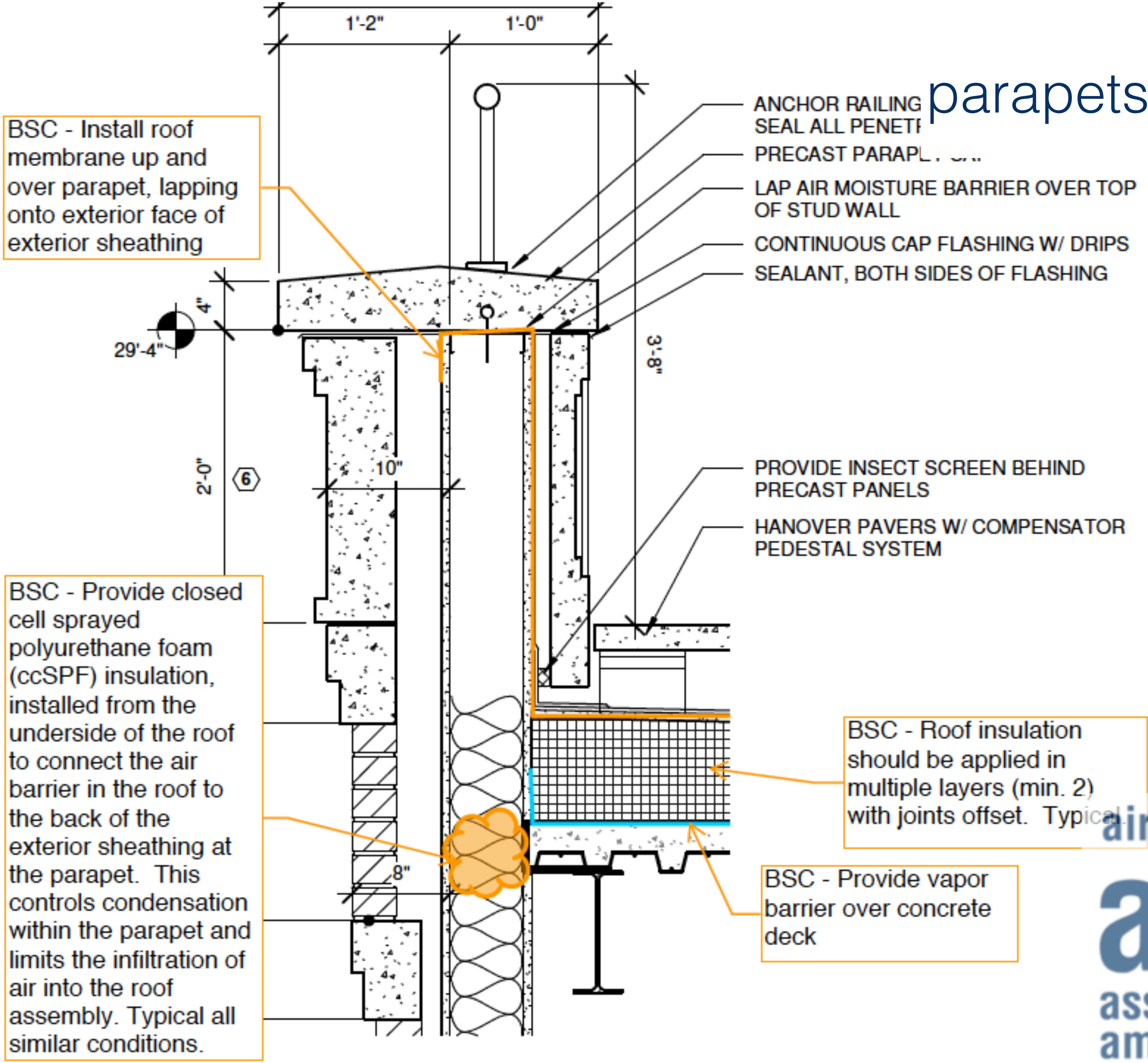
parapets - block



3 BLOCK PARAPET DETAIL
1" = 1'-0"

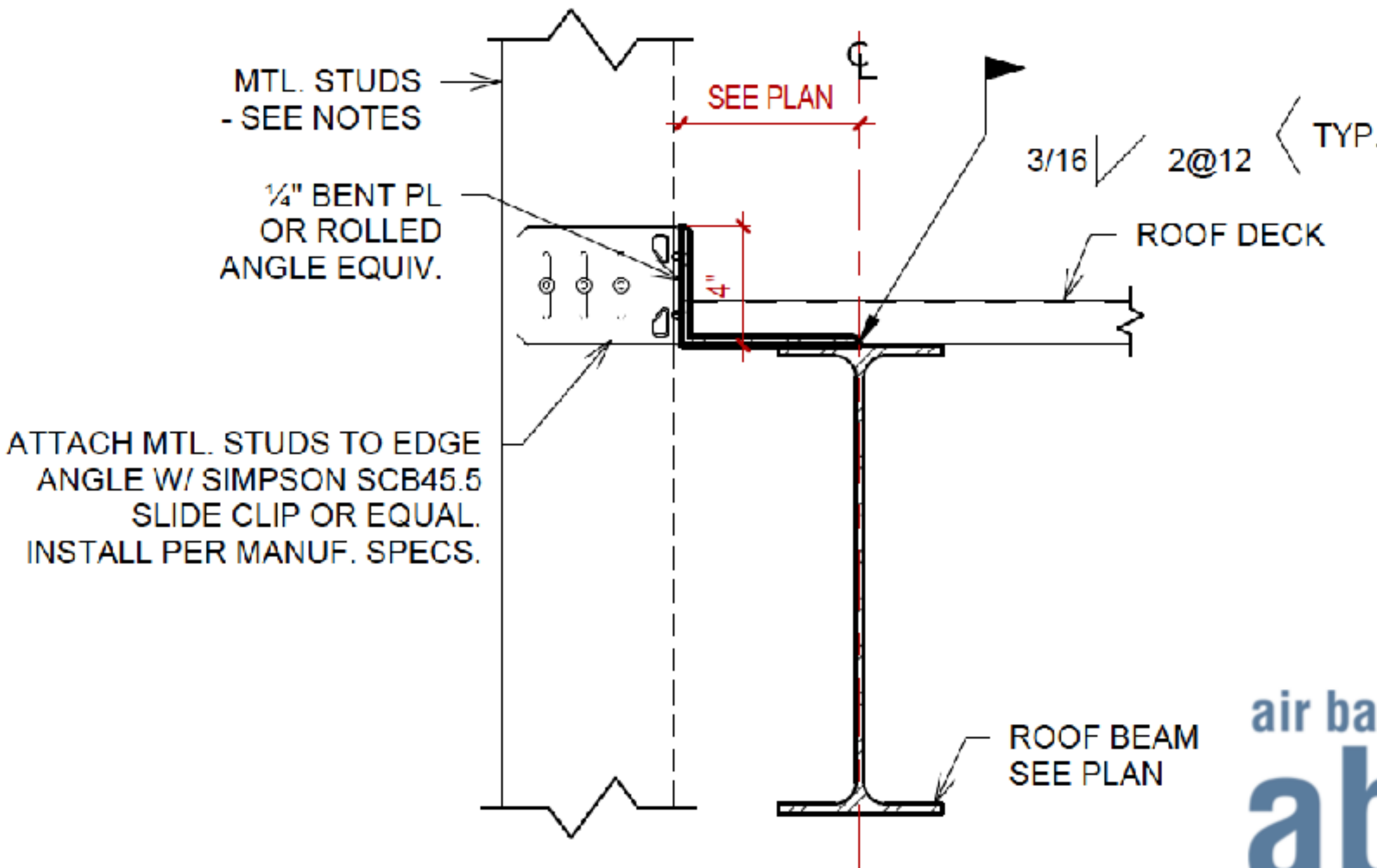
air barrier
abaa
association of america

parapets - framed



air barrier
abaa
association of america

check the structural drawings!




is this a problem?
air barrier
abaa
association of america

in summary…

- reduce the loads
  - head flashings, overhangs, drips, kerfs
  - use drained and back vented claddings
  - slope generously
- connect the control layers
  - slab-to-wall, wall-to-roof, wall-to-glazing & other penetrations
  - pay attention to the big holes
- assume imperfection
  - provide redundancy
  - provide drainage
  - allow drying

** use any of the photos you'd like… but with credit, please*

air barrier
abaa
association of america