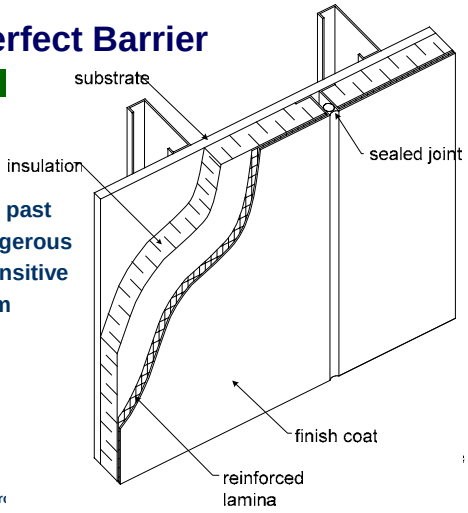
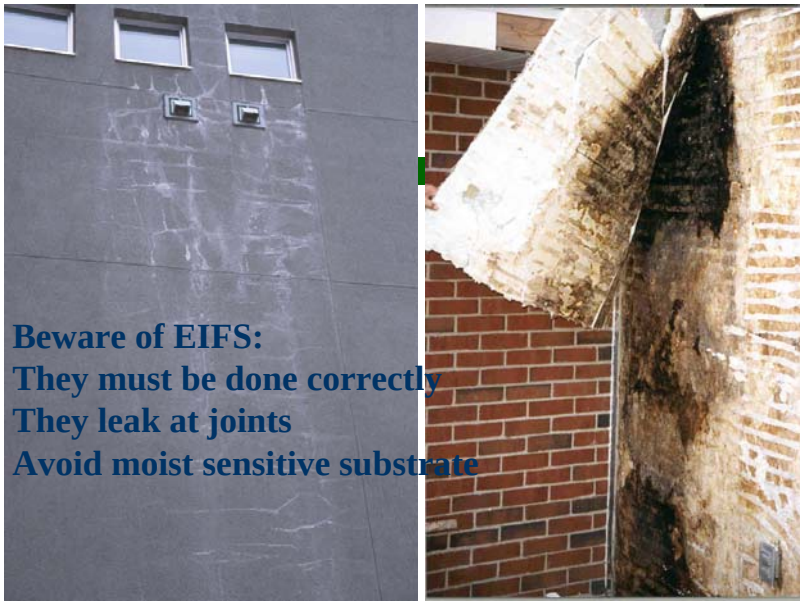
EIFS Rain Control

- Both Drained and Perfect Barrier can be used
- Joints and Element can be designed differently

Face Sealed Perfect Barrier



- The problem wall of the past
- Relies on sealant = dangerous
- Often used moist sensitive OSB and exterior gypsum



Beware of EIFS:
They must be done correctly
They leak at joints
Avoid moist sensitive substrate

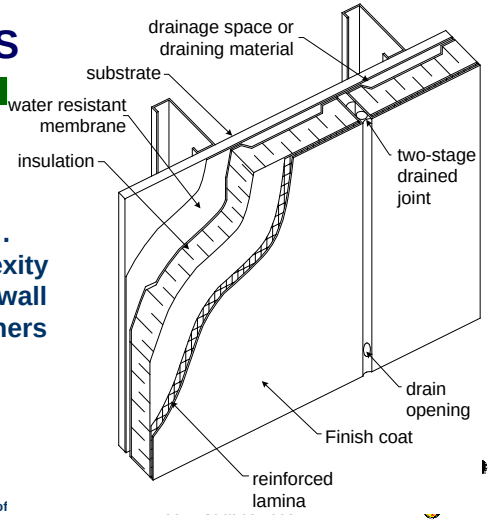
EIFS

Substrate + moisture = problem

- Moisture sensitive substrates are a problem

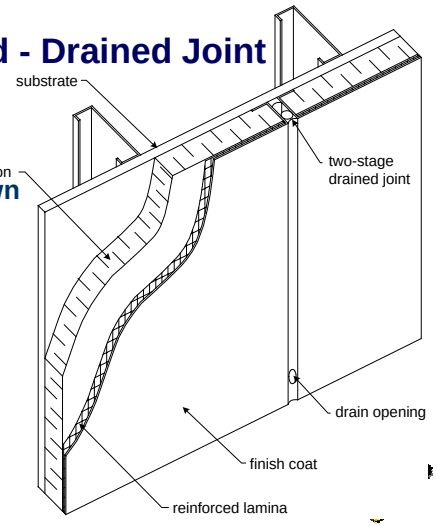
Drained EIFS

Feels good, but ….
Additional complexity
May trap water in wall
May require fasteners



EIFS Face Sealed - Drained Joint

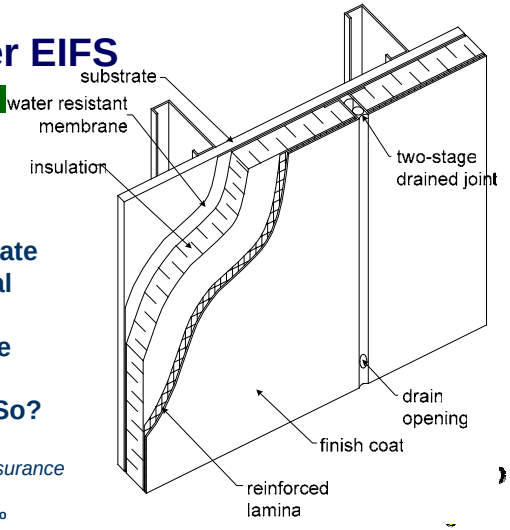
- Sometimes called "Source Drained"
- Implies source is known
- Substrate may be exposed to incidental moisture
- Slow drying



Dual Barrier EIFS

- **Drained Joints!**
- Protects substrate against incidental water
- Allows adhesive attachment
- Slow drying ... So?

Now required for OAA insurance



The rain control strategy selected for EIFS depends on three primary variables:

Exposure - a combination of the climate and the shape, size orientation, and siting of the building

System Quality - a combination of design, materials (including the moisture tolerance of the substrate), workmanship, the confounding effects of weather during installation and the economic situation.

Performance Expectations - a function of the clients' expectations, minimum code requirements, etc.

Minimum Recommended EIFS Wall Rain Control Strategies

	Exposure A	Exposure B	Exposure C
Quality 1	FS†	DB/DJ	DB/DJ
Quality 2	DB/DJ	DB/DJ or D	D
Quality 3	DB/DJ	D	PM

† **Face-sealed EIFS are not recommended for any architecturally-designed applications, and will not be covered by the OAA Indemnity Plan.**

Exposure Classes

A - Two-stories or less, with good overhangs and suburban or urban exposure

B - Low-rise without overhangs, mid-rise suburban or urban exposure. Open or seaside exposure for A

C - high-rise, all exposures. Open or seaside exposure for B

Note: different orientations and heights may have different exposures.

Quality Classes

1 - full time third party inspection, experienced crew, detailed design and documents (e.g., 3-D isometrics for details)

2 - intermittent inspection, average crew, average design and documents

3 - little or no inspection, inexperienced or rushed crew, simple design and limited documents

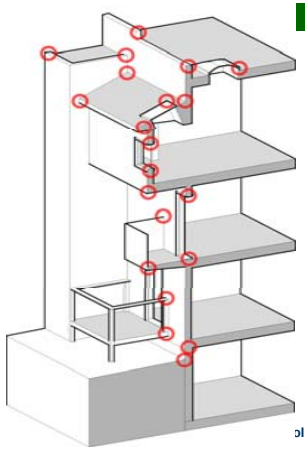
BCC Ruling

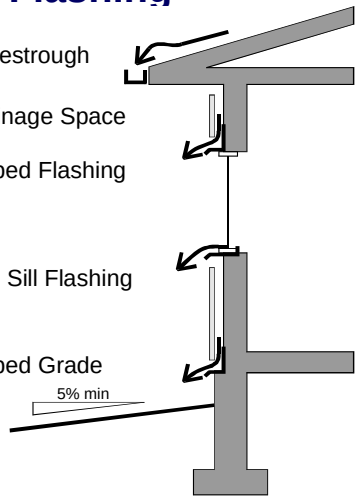
- **Wood frame hotel in GTA**
- **Face-sealed joints**
- **Over Tyvek**
- **Drained?**

- **Meet Code?**
- **Meet OAA?**

Joints / Flashing

"House of Horrors"





Types of Flashing

- Base flashing
- Counter flashing
- Step flashing
- Valley flashing
- Cap Flashing
- Wall Flashing – drainage plane to exit

Physical Principles

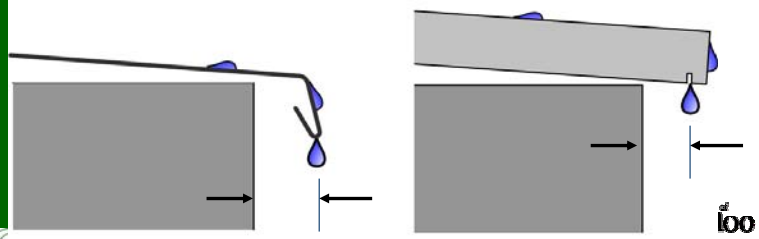
- *Water runs downhill (!)*
- *Flashing is the perfect barrier in drained walls*
- *Nothing is installed flat or butted tight*
- *Everything moves*
- *Exposed caulking eventually fails*
- *If it doesn't get wet, it wont leak (exposure!)*

Requirements

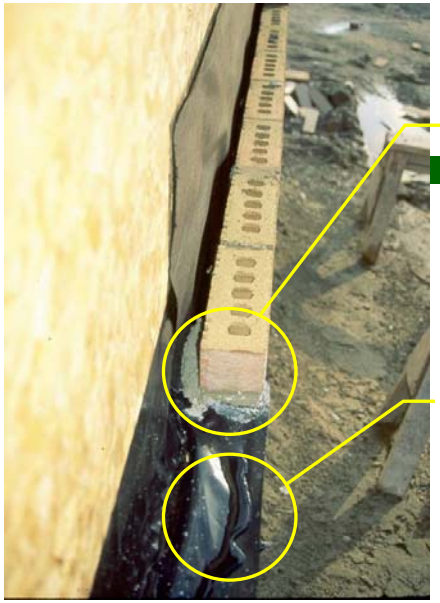
- Slopes
  - drainage
- Continuity (Sealed Joints)
- End Dams, backstops, deflectors
- Drips
  - shedding
- Accommodate Movements
- Material choice Watertight

Drips

- project out from wall
  - Recommend 1" if you wish to drip free of wall
- control "run back" by grooves and edges




•Generous projection
•Clear drip groove
•Large side extensions



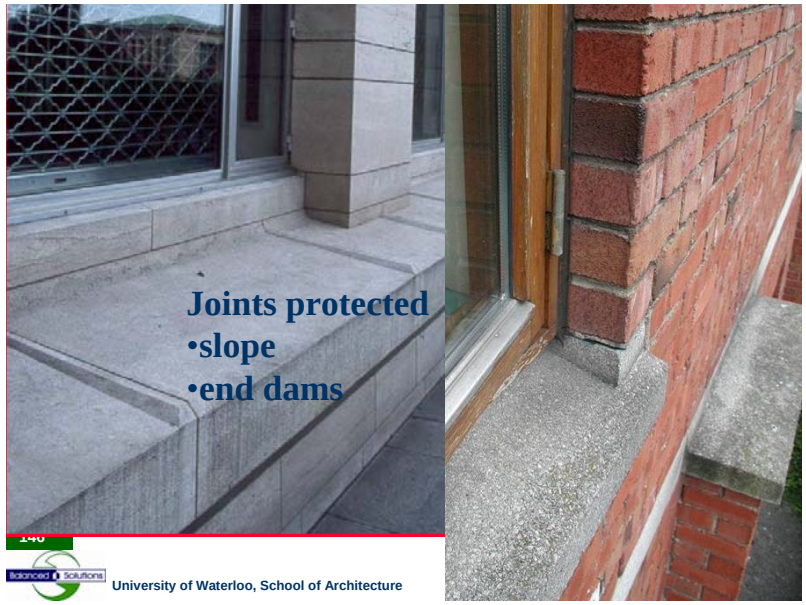
Water can build up here -- we need a waterproof barrier

Note water standing

University of Waterloo

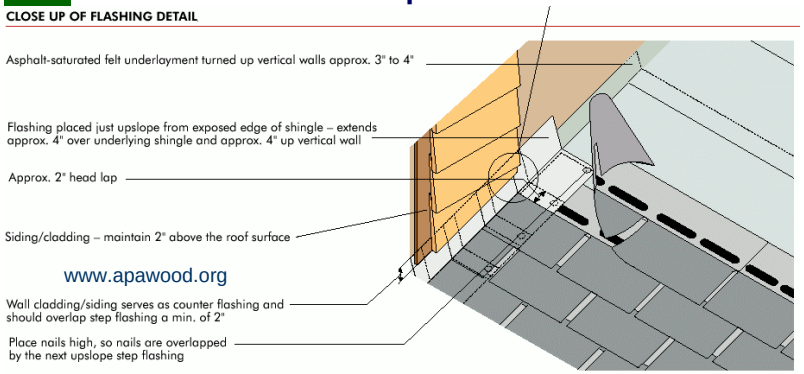
End-Dams & Backstops

- all low-slope flashings need end dams, e.g.
  - window-sills
  - masonry-veneer
- Backstop at rear typically minimum of 4”
- Typically specify 6” for high exposure
- Corners must be made watertight - vulnerable

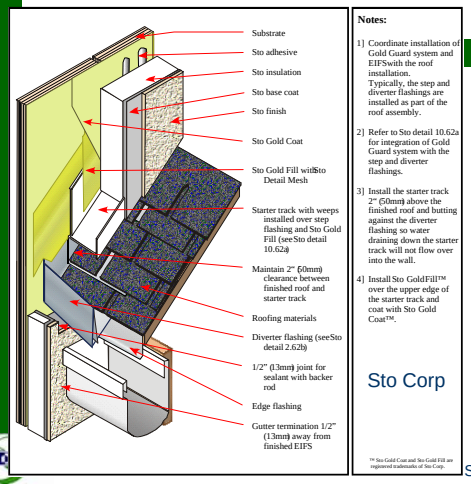


Low Roof to Wall

- Common source of problems



Diverter Flashing



Notes:

1] Coordinate installation of Gold Guard system and EIFS with the roof installation. Typically, the step and diverter flashings are installed as part of the roof assembly.

2] Refer to Sto detail 10.62a for integration of Gold Guard system with the step and diverter flashings.

3] Install the starter track 2" (50mm) above the finished roof and butting against the diverter flashing so water draining down the starter track will not flow over into the wall.

4] Install Sto GoldFill™ over the upper edge of the starter track and coat with Sto Gold Coat™.

Sto Corp

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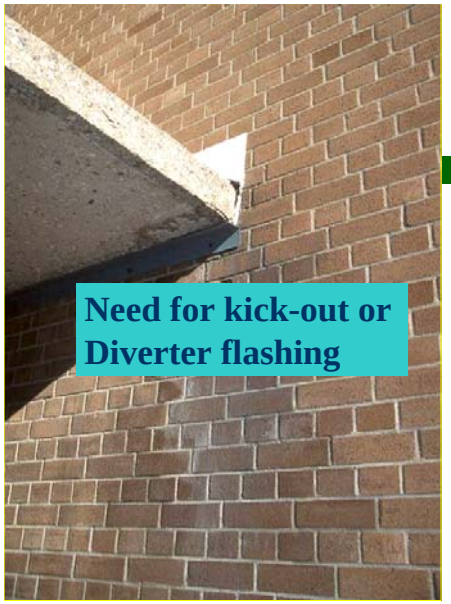
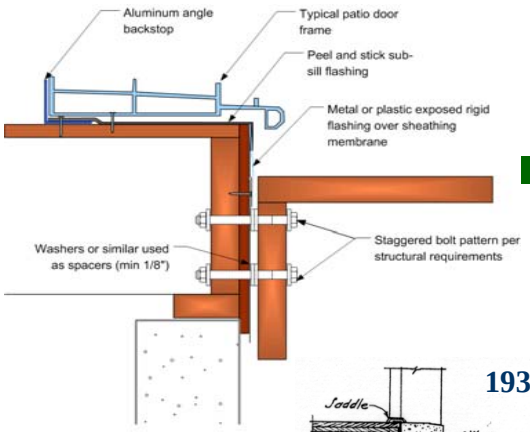
Another simple, but critical, detail



Need for kick-out or Diverter flashing

Door Sills

Door sill



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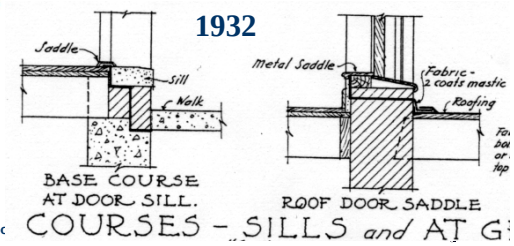
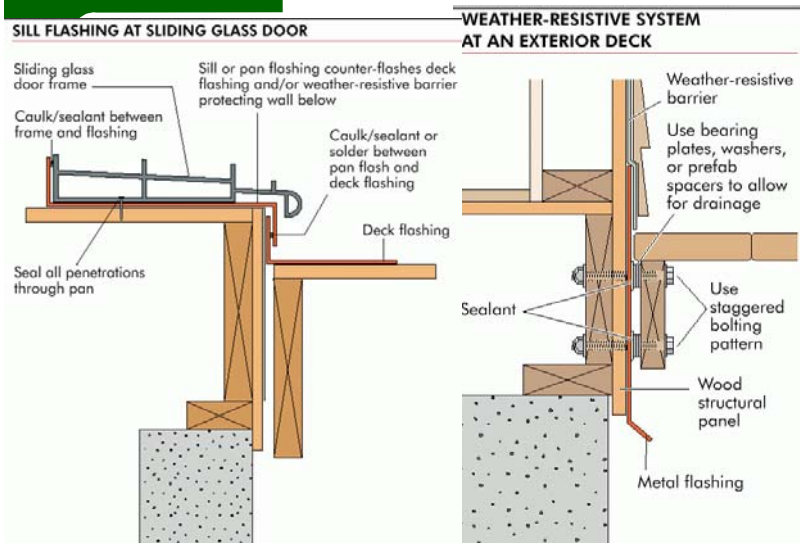


See www.apawood.org

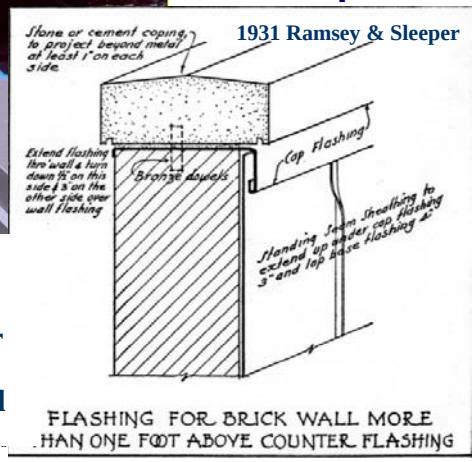


Continuity: Seal joints

- Remember -- Flashing acts as a waterproof layer
- Seal all joints, or overlap <u>and</u> drain
- Masonry, metal, and precast copings are <u>not</u> waterproof!

Balcony
- note backstop curb
- waterproof membrane

Parapets



- Coping leaks at joints
- Provide a sealed waterproof second layer
- Metal acts as finish and protection

Detail at penetrations

John Straube 2005

Proper Materials

- Waterproof
- Durable
- Compatible
  - With adhesives, substrates, and fasteners
- Formable
  - at a range of temperatures
- Mechanical properties
  - Puncture resistance (Self-sealing)
  - tear resistant

Capillary Break

- Flashing may provide a break for capillary flow
- Important at grade
- Important for claddings like wood, stone, masonry

Rain Control Conclusions

- Choose rain control based on
  - exposure
  - climate
- Climate/exposure dictates care, strategy, effort
- Don't expect perfection from materials and trades
- Drainage plane continuity is key!
  - Flashing!

Fire Resistance

System Type	Insulation	Lamina Base Coat	Code Reference	Allowable Uses With Respect to Fire Safety
A	Non-Foam Plastic Insulation	Non-Combustible	3.2.3.7	These systems can be used without restriction in non-combustible construction.
B	Foam Plastic Insulation	Non-Combustible	3.2.3.7	These systems can be used in non-combustible construction on the basis of testing that demonstrates the base coat is non-combustible, and the lamina stays in place when tested according to ULC-S101 for 15 minutes. Use of this system can be restricted if limiting distances are not satisfied.
C	Foam Plastic Insulation	Combustible	3.1.5.5	These systems can be used where non-combustible construction is required on the basis of having passed the ULC-S134 fire test. Use of this system classification is limited to specific heights that vary by region and whether or not fire sprinklers are present.
D	Foam Plastic Insulation	Combustible	Parts 3 or 9	These systems are for use where combustible construction is permitted, in either Parts 3 or 9.

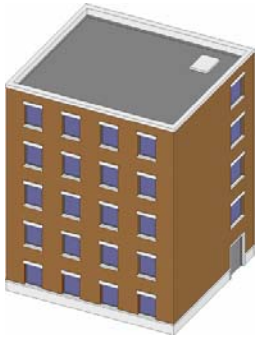
Enclosure Design Principles-1

- Design a complete load transfer path
  - structure, windows, ties, etc
  - All loads go to ground
- Respect the site and climate
  - rain, sun, wind, hill, valley, high rise or low-rise
- Continuous rain control plane
  - control with surface features and detailing
  - Drained, storage, or perfect barrier strategy
- Continuous plane of air barrier tightness
  - fastidious attention to detail 3-D

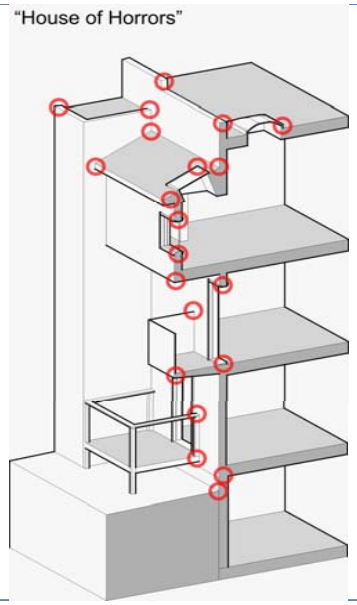
Enclosure Design Principles-2

- Provide a continuous plane of insulation
  - ideally separate structure from enclosure
  - *Avoid thermal bridges*
- Provide a moisture tolerant design
  - balance wetting, drying, and storage (matl's, climate)
- Use appropriate levels of vapour control
  - vapour barriers are not "the" answer
- Accommodate movements and tolerances

The Enclosure: Adding the Layers



- Structure
- Air Barrier
- Insulation
- Rain Control
- Finish



Details demand the same approach as the enclosure.

Scaled drawings required at ○

Conclusions

- **EIFS**
  - **Get the guides**
  - **Sell the comfort and efficiency**
- **Be clear of rain control strategy**
  - **consider exposure**
  - **Surface drainage**
  - **Windows**
  - **joints**
- **Provide a good air barrier system**
  - **don't be confused by vapour barriers!**