MASONRY

Part I: Masonry in Architecture

- Structural Morphology

  i. Load Bearing

  ii. Non-load Bearing

Images:

Institute of Chemistry, IIT
Mies van der Rohe, 1945

Library and Administrative Building, IIT
Mies van der Rohe, 1944

House
Mies van der Rohe,
Wall Section, 1934

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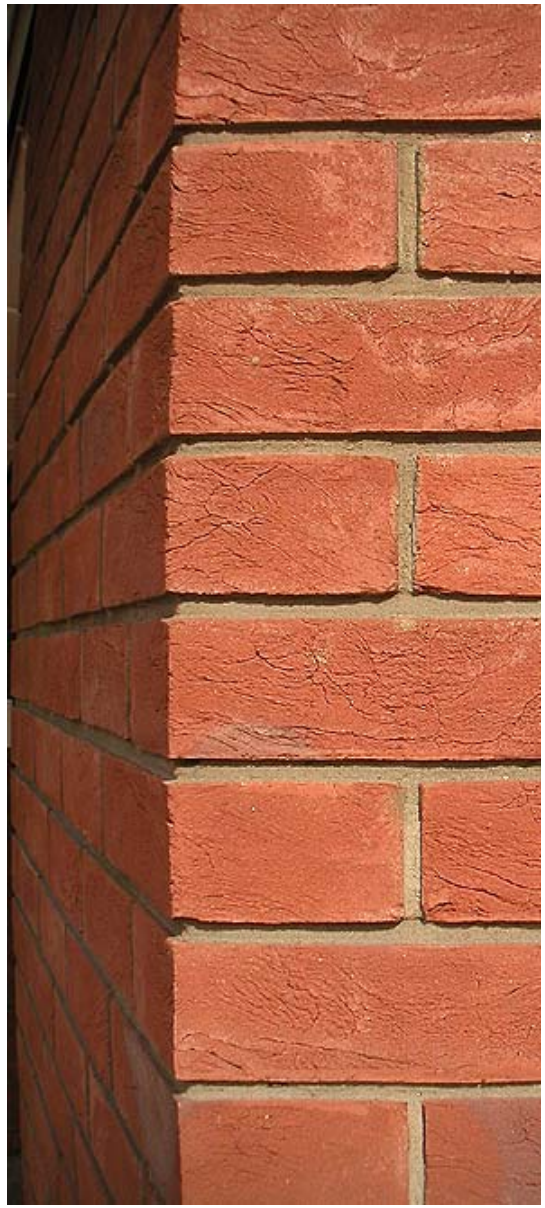

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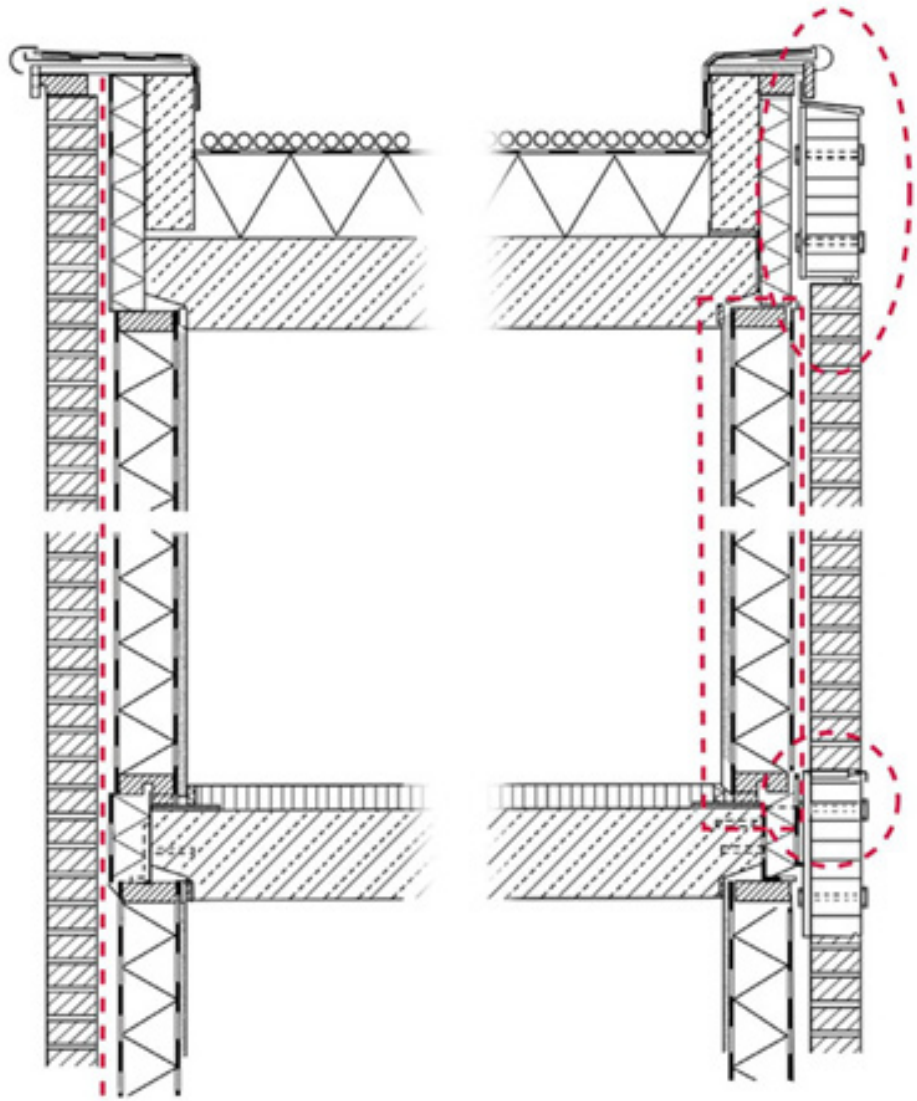
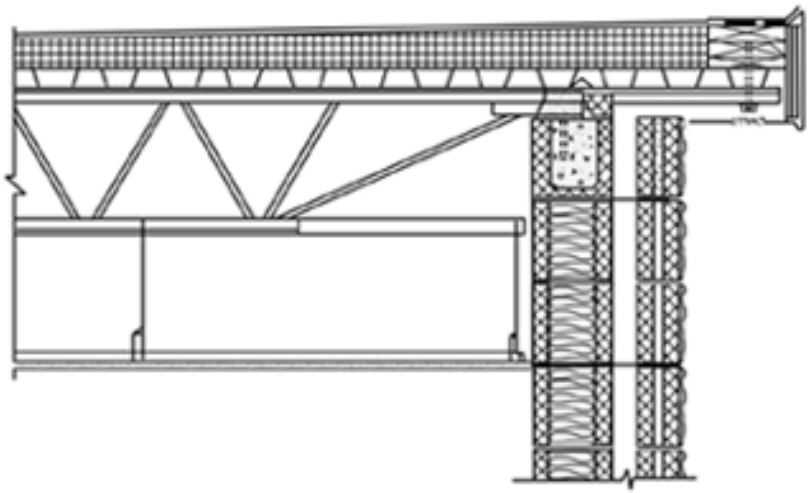


Image by MIT OCW.

Part II: Masonry Systems and Architecture

- Principles of masonry construction
- Construction
- Loading and deformation



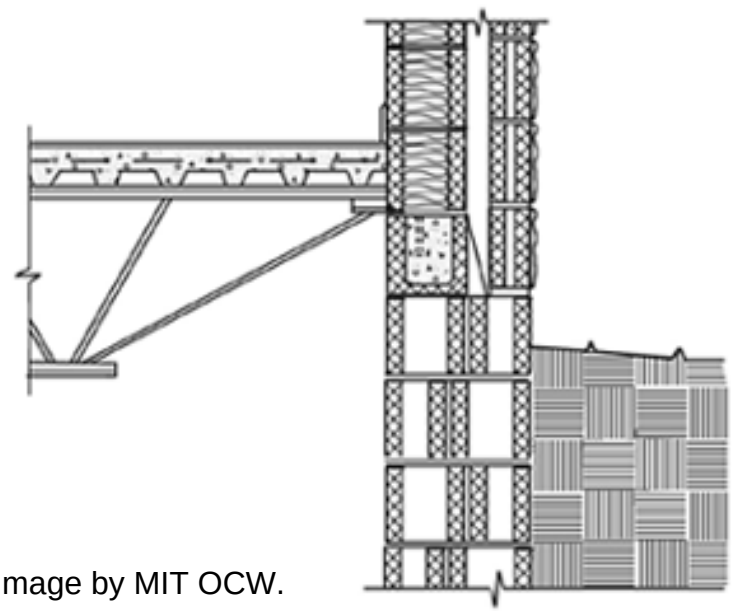


Image by MIT OCW.

Part II: Masonry Systems and Architecture

Overview

- Water Penetration Resistance
  - Wall Systems
  - Flashing and Weep holes
  - Coatings
- Differential Movement
  - Cracking
  - Movement Joints

Part II: Masonry Systems and Architecture

Problems related to water penetration

- Water entry into interior
- Efflorescence
- Spalling
- Corrosion
- Reduced insulating capacity
- Staining / Mold / Mildew

Keys to Providing Water Penetration Resistance

- Quality Materials
- Good Construction
- Proper detailing
- Maintenance

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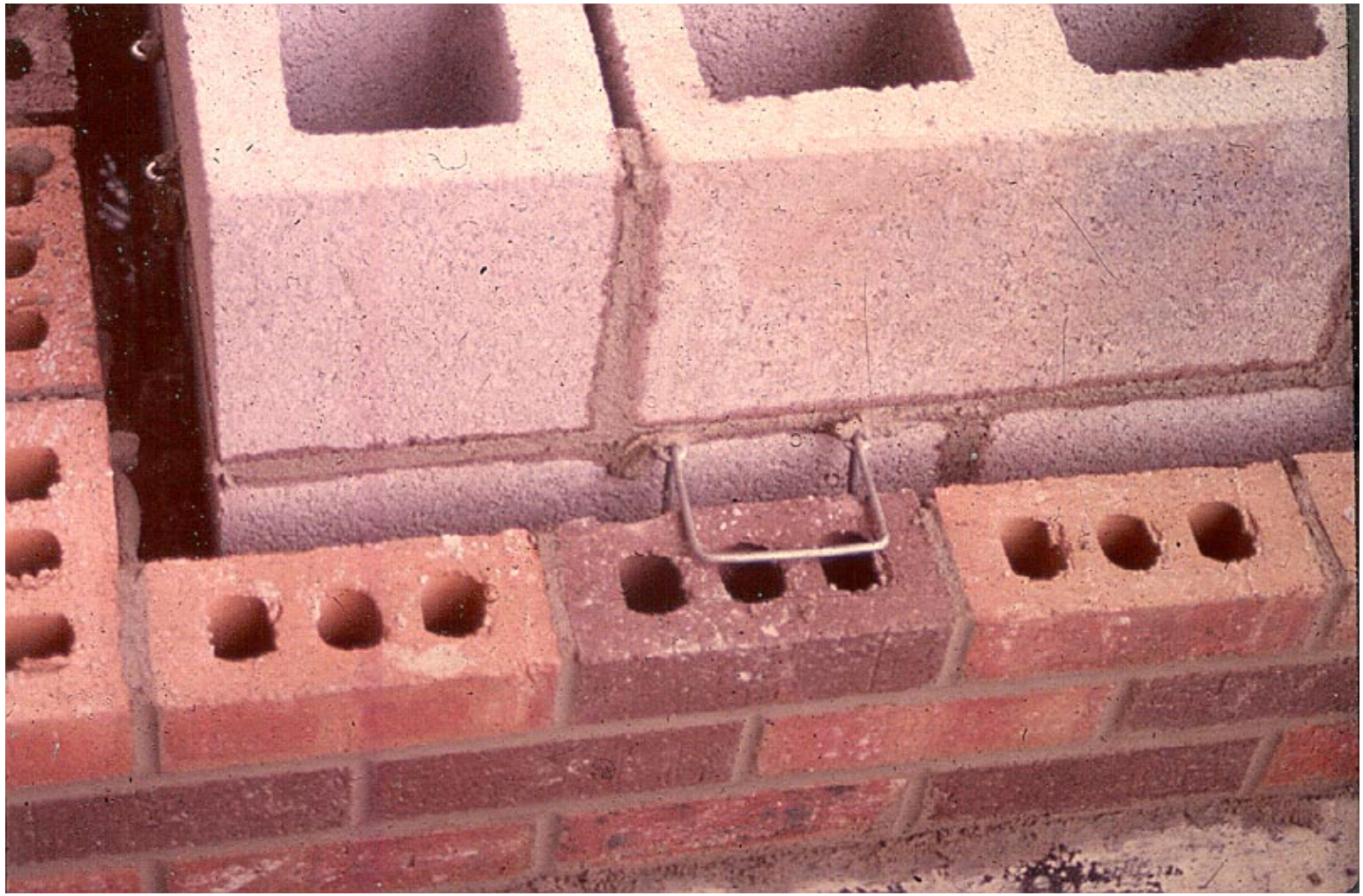
Three Basic Wall Types

- Drainage Wall
- Barrier Wall
- Single Wythe Wall

Drainage Wall



Drainage Wall

- Water travels down back side of outer wythe, collected on flashing, and channeled to exterior through weep holes
- Examples:
  - Cavity walls
  - Masonry veneer walls
  - Rain screen walls

Drainage Walls Requirements

- 2 to 4 ½ inch clear cavity
- Flashing and weep holes to channel out excessive water

Rain Screen Wall

- Equalizes pressure within cavity
- Vents at top and bottom of wall or panel
- Flashing and weep holes
- Compartmentalized
- Allows for ventilation and evaporation

Barrier Wall

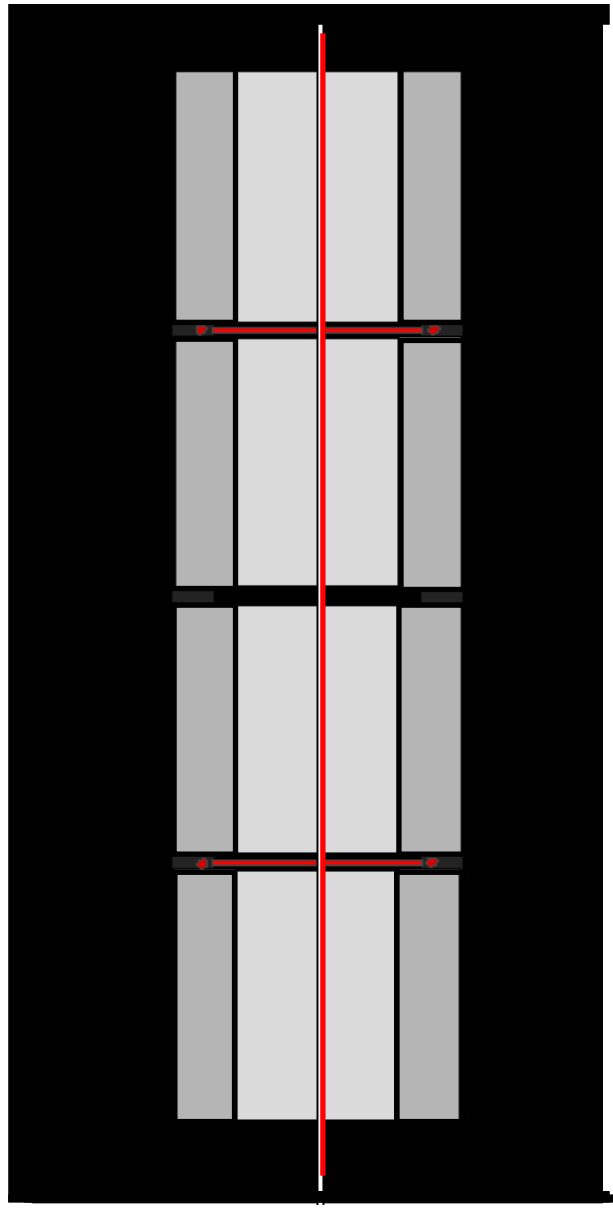
- Collar joint between wythes acts a barrier to moisture along with the thickness of the wall
- Examples
  - Brick and Block Composite Wall

Barrier Wall

- Voids allow water penetration
- Must be filled solid with mortar or grout

Single Wythe Walls

- Masonry units with coating or integral water repellent
- Mortar with integral water repellent
- Through-wall flashing
- Weep Holes
- Vents



"A nominal four-inch wythe of

brick masonry,

no matter how well built, by whom,

or of what, never stopped

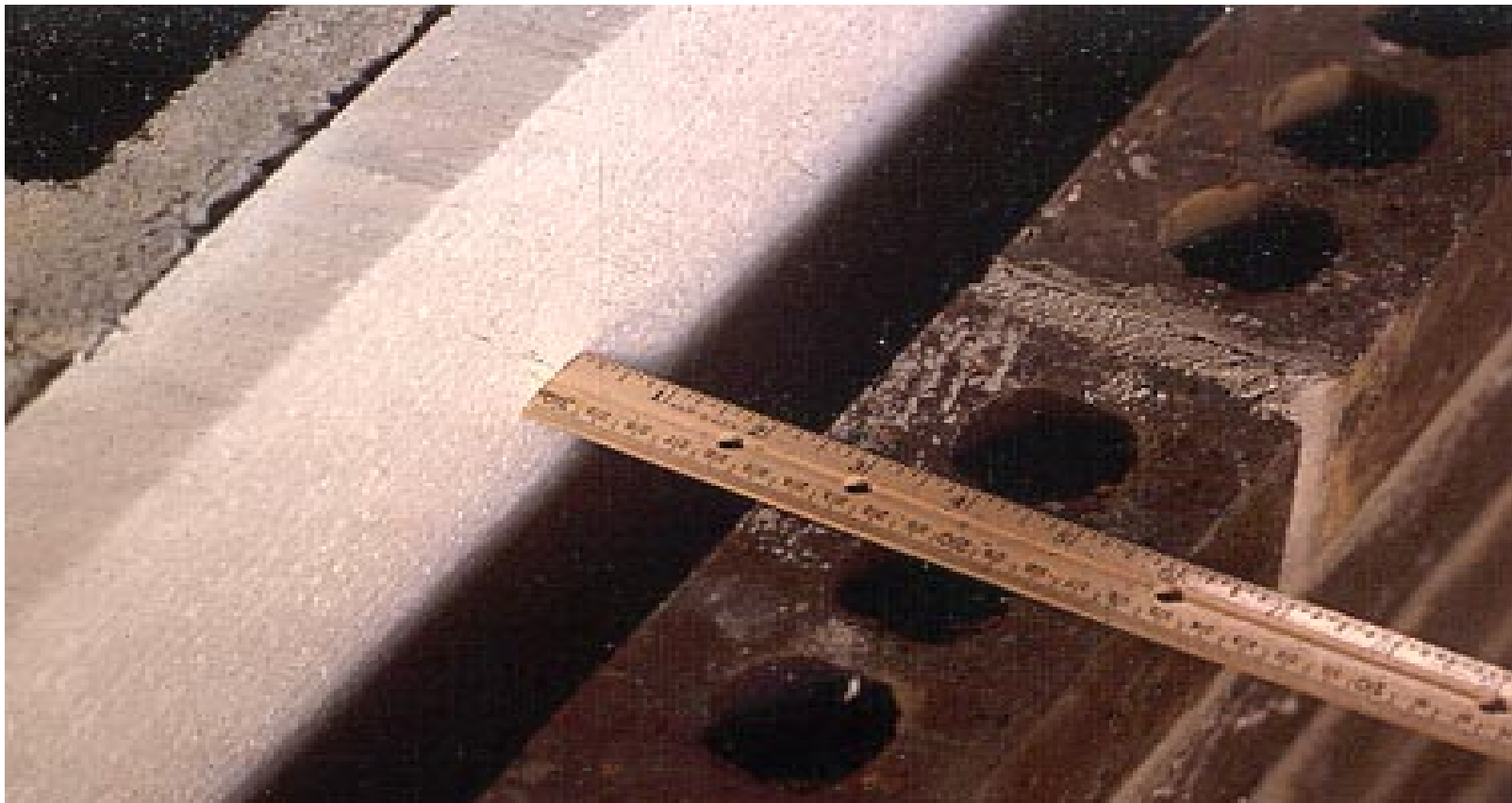
a wind driven rain."

Air Space Requirements

- 2” minimum to be effective

Air Space

- Clear and free



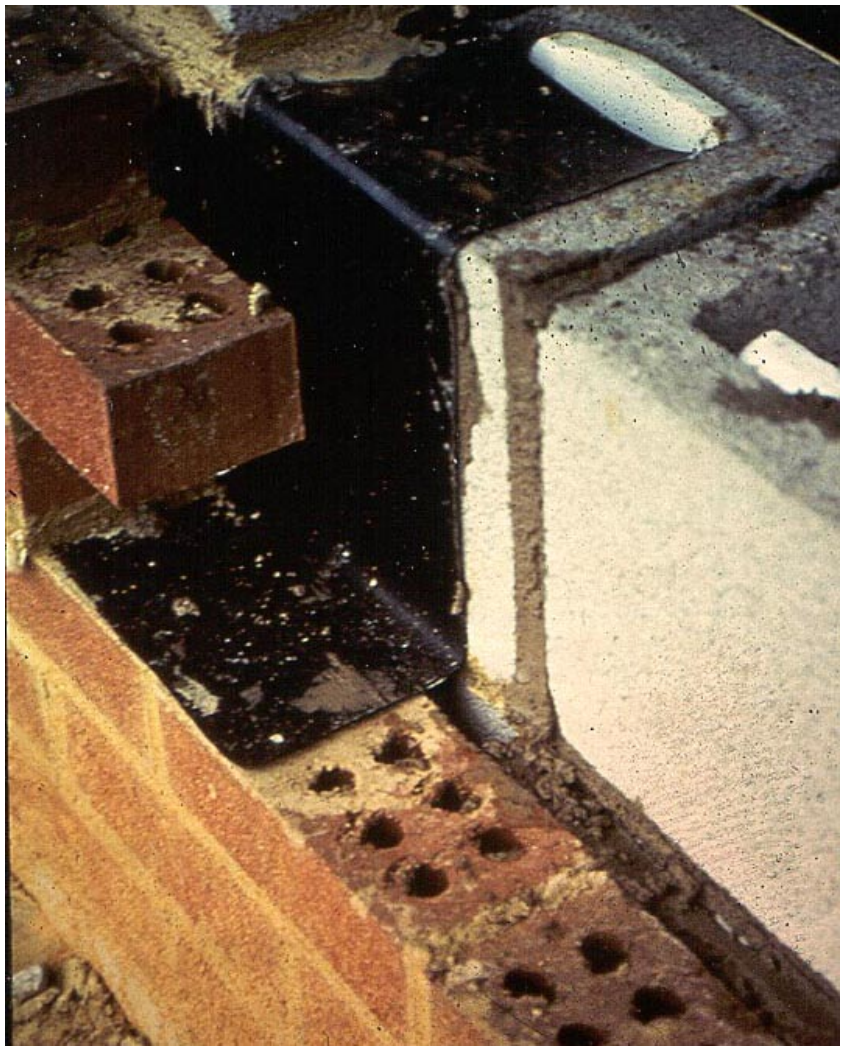
Flashing Details

- Locations
- Placement

Flashing Locations

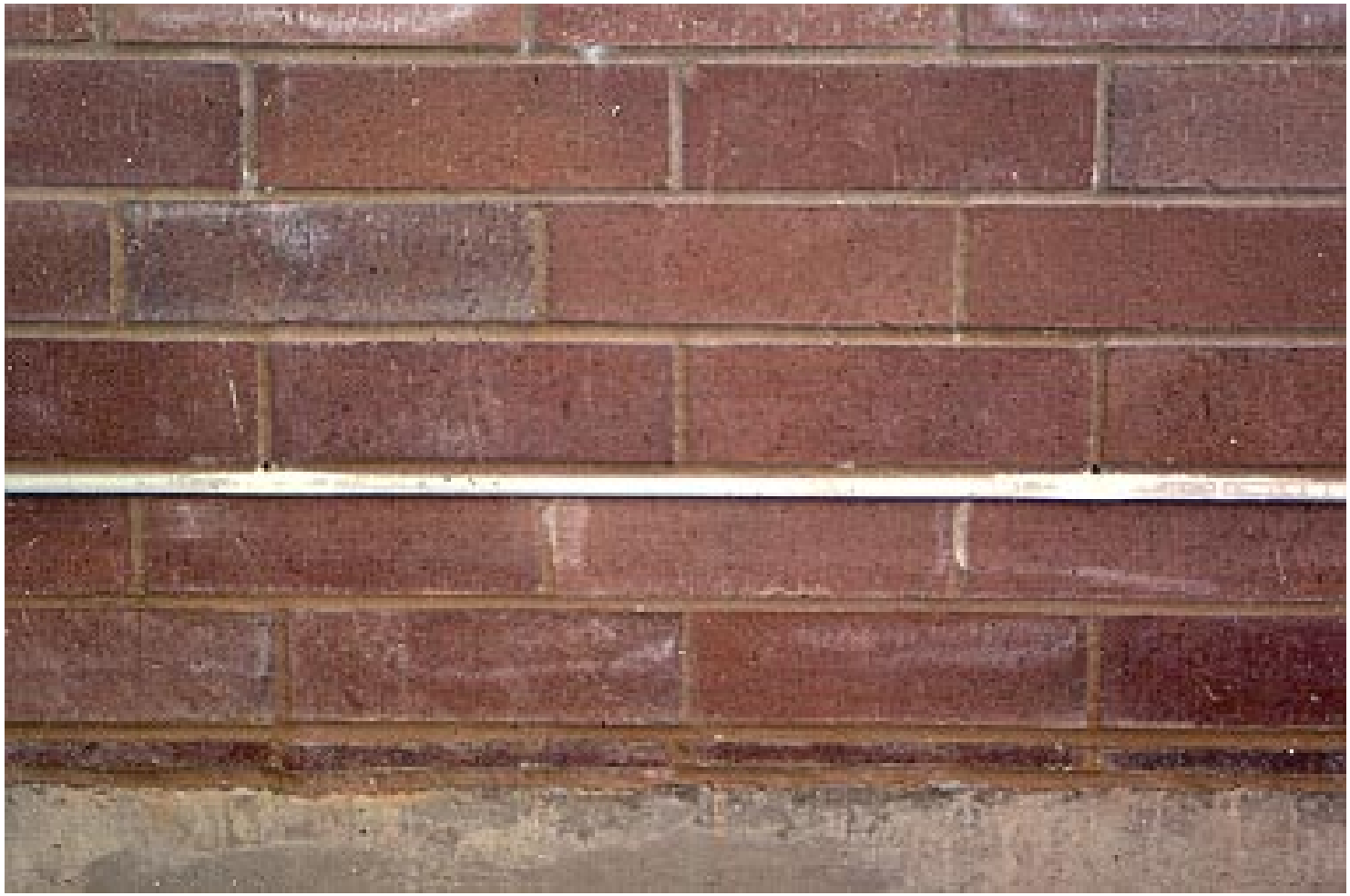
- base of wall
- sills
- heads of windows
- at shelf angles
- copings
- lower wall/ higher roof intersection
- other discontinuities in air space

Good Flashing Detail



Poor Detail

Drip Edge



SS Drip Edge