

# Exterior Finishes



**Arch 1240 Methods of Construction in Architecture**  
**Professor Jason Montgomery**



# **Exterior Finishes** (CHAPTER 6)

## **For Wood Light Frame Construction**

### **Roofing**

**Roof Drainage**

**Ice Dams and Roof Ventilation**

### **Windows and Doors**

**Installation**

**Waterproofing**

### **Siding**

**Board Sidings**

**Plywood Sidings**

**Shingle Sidings**

**Stucco**

**Masonry Veneer**

# CONSTRUCTION SEQUENCE:

- EXCAVATION
- FOUNDATION
- STRUCTURAL FRAME
- EXTERIOR ENVELOPE
- INTERIOR SERVICES
- INTERIOR FINISHES





# ROOFING



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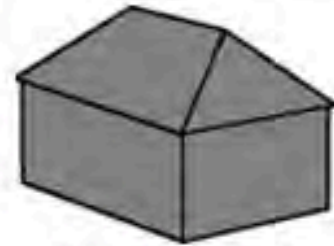
# ROOF TYPES



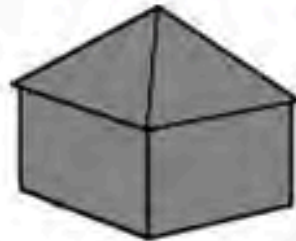
Gable Roof



Cross Gabled Roof



Simple Hip Roof



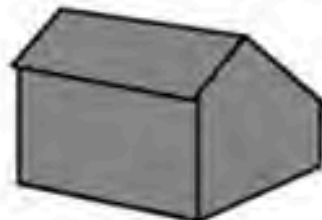
Pyramid Hip Roof



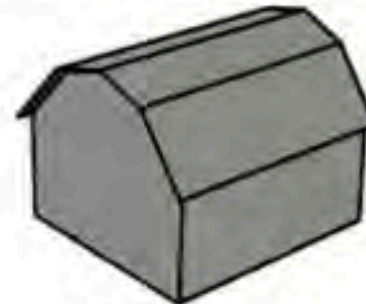
Cross Hipped Roof



Mansard Roof



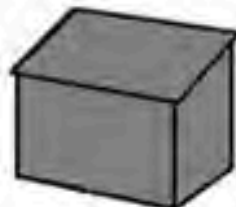
Saltbox Roof



Gambrel Roof



Flat Roof



Shed Roof

# Protection From the Weather

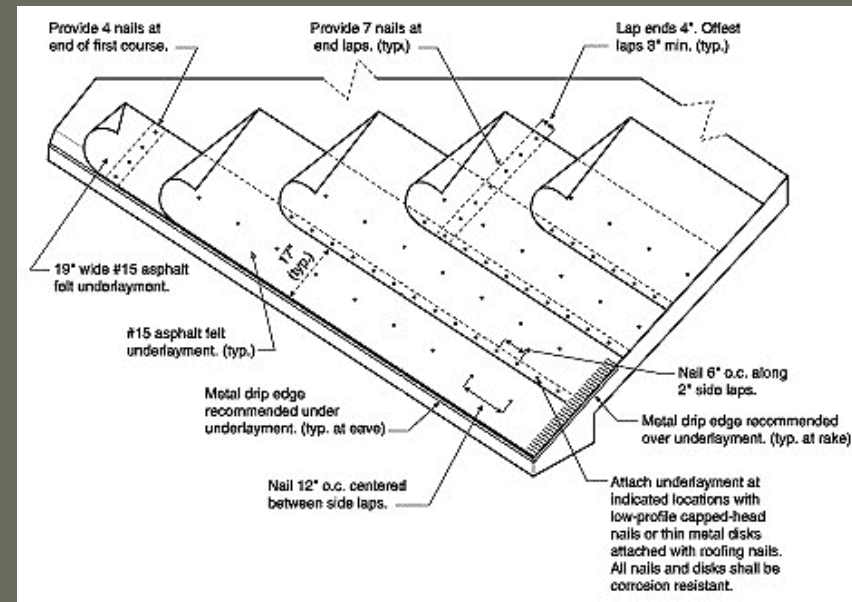
- The structure is closed in or made "tight to the weather" as soon as possible.
- Roofing *underlayment* is installed first, to provide temporary weather protection.
- The rake metal *drip edge* has also been installed in this photo.





# Roofing Underlayment

- Underlayment is applied starting from the low point of the roof, working upward and overlapping in shingle fashion so that water running down its surface cannot flow underneath.
- Underlayment may be traditional *building felt* or newer synthetic fabrics.



# Finishing the Eaves and Rakes

*Eaves* and *rakes* are finished before roofing is installed.



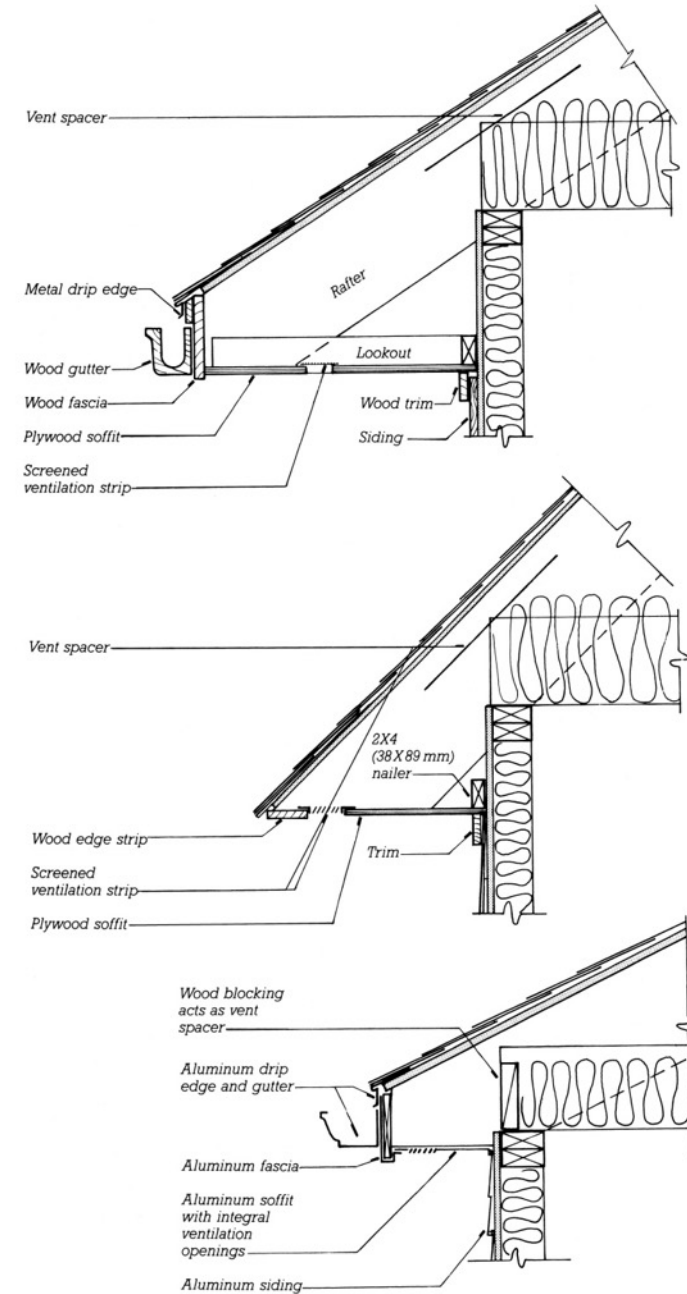
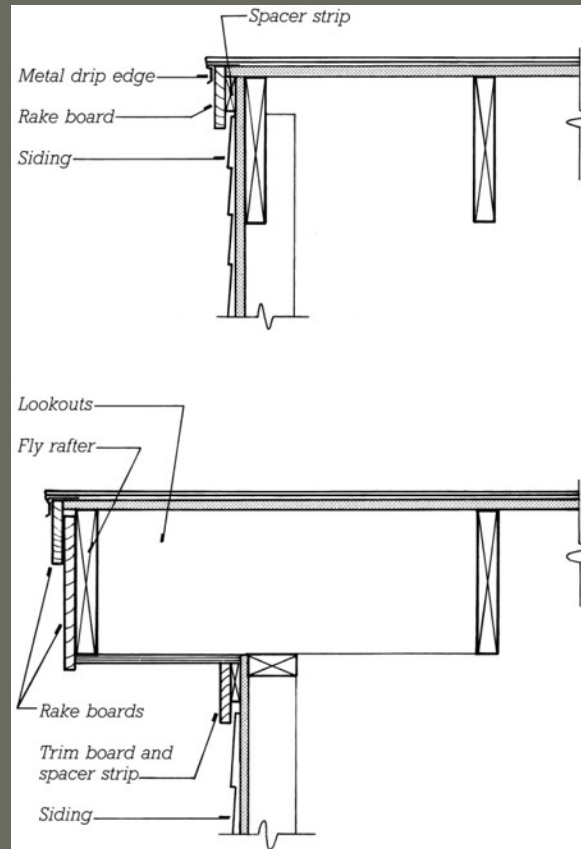
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# Eaves and Rakes

## Terminology:

- Drip edge
- Rake board
- Fascia
- Soffit
- Ventilation strip
- Gutter



# Eaves and Rakes

## Terminology:

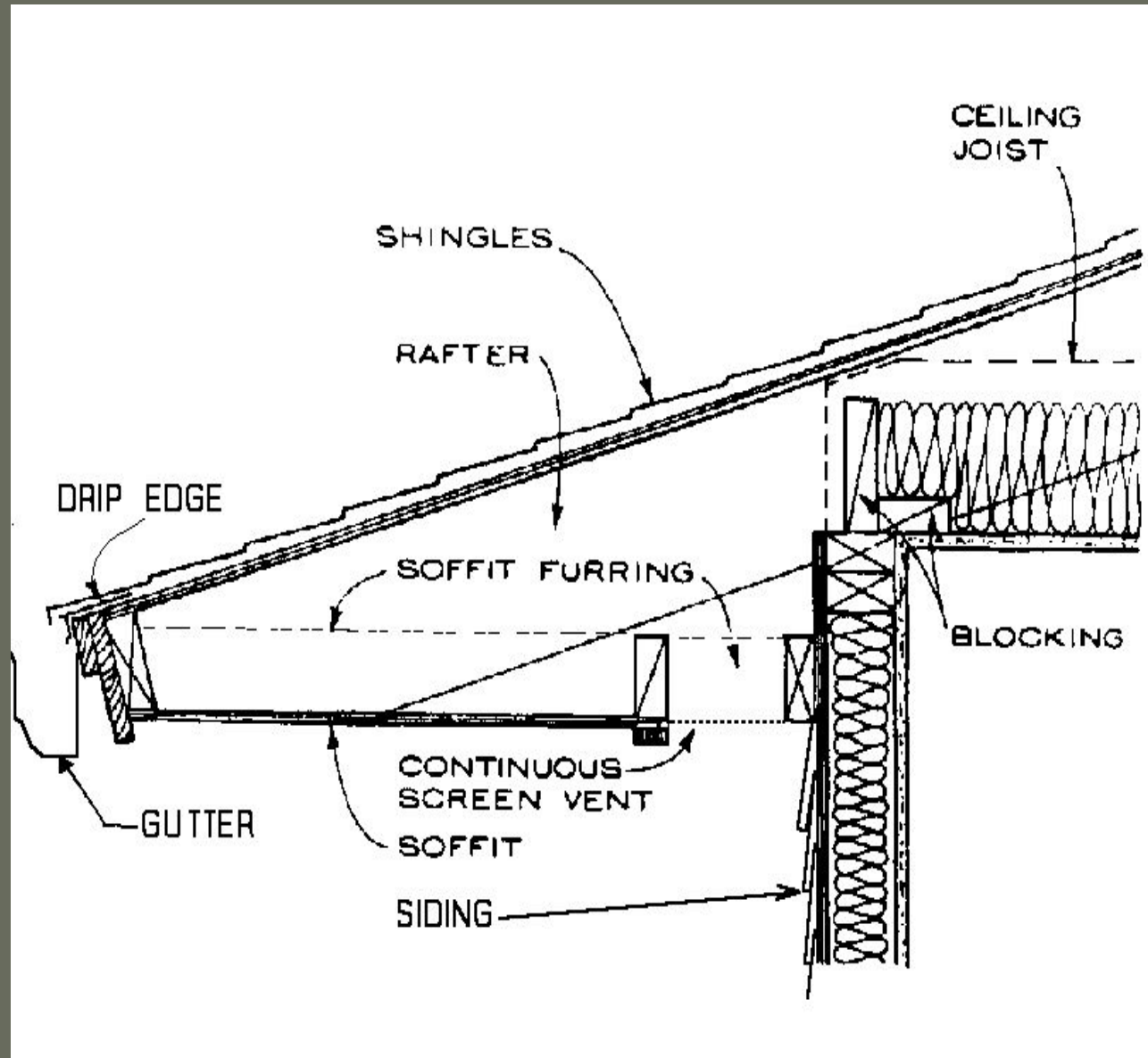
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# Eaves and Rakes

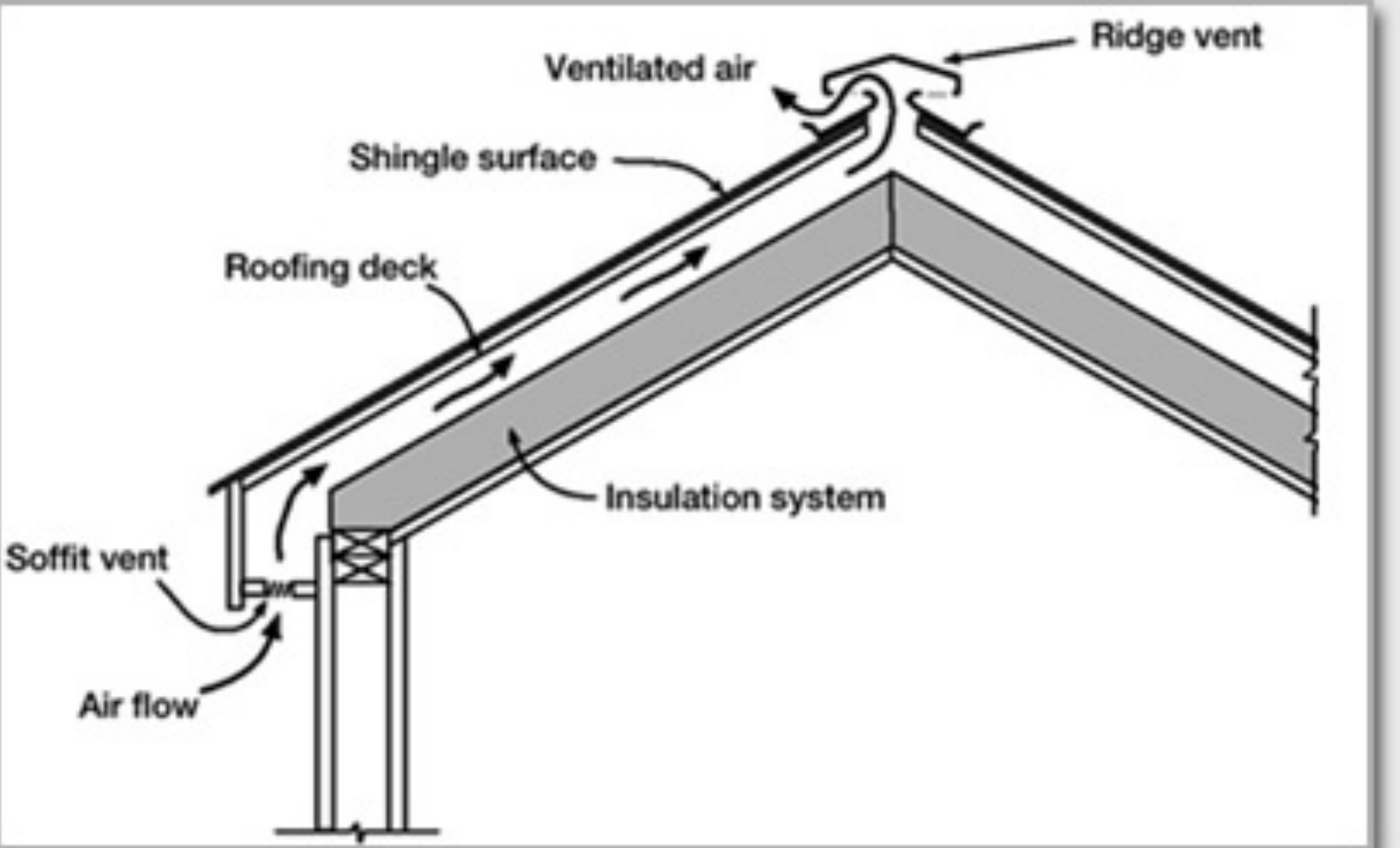
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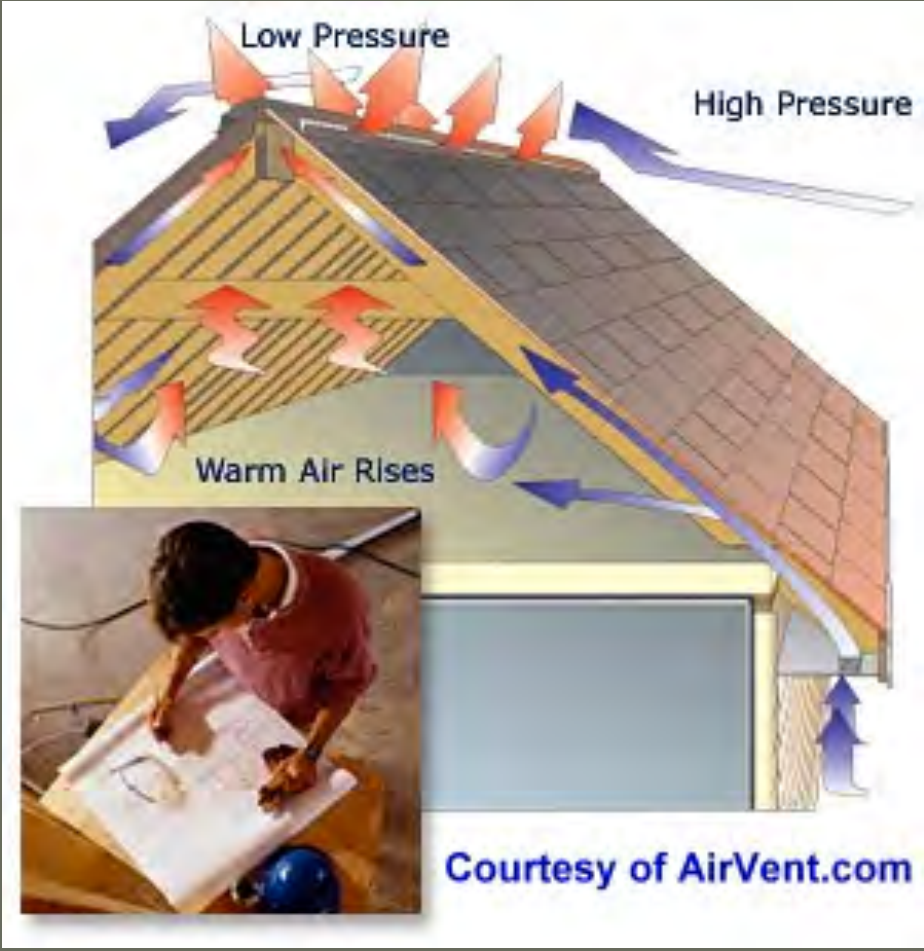
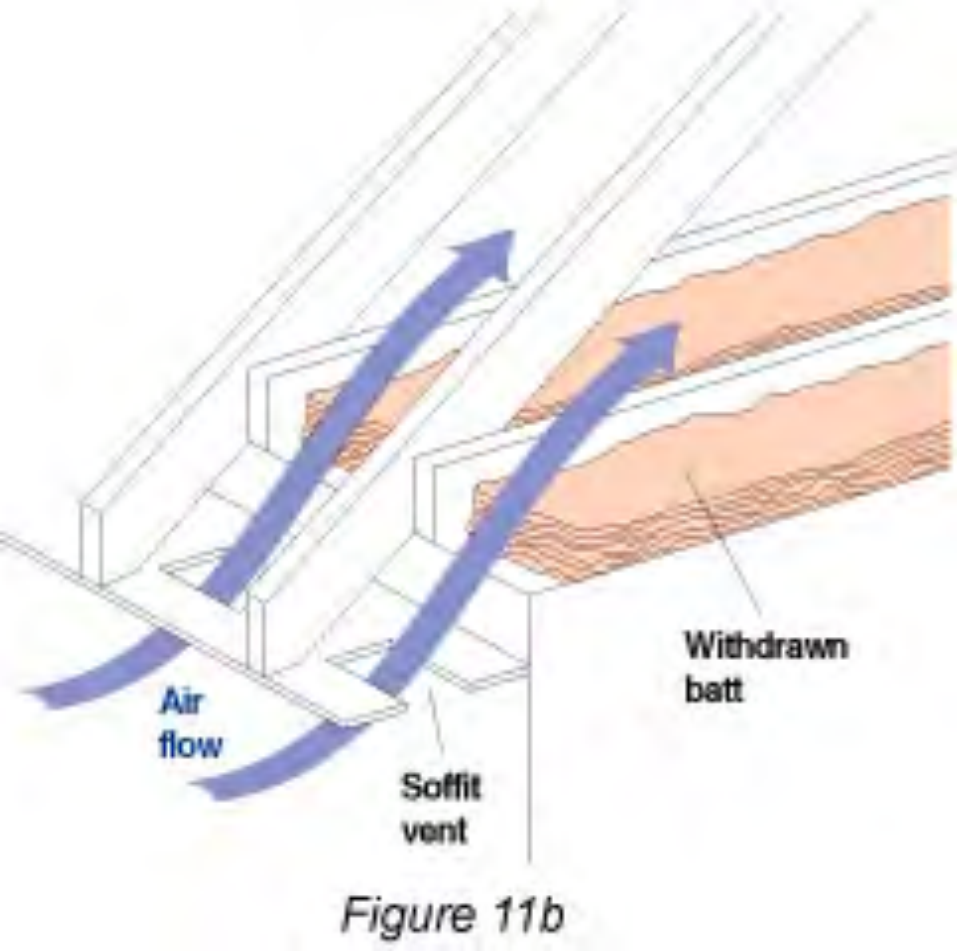




# Roof Ventilation



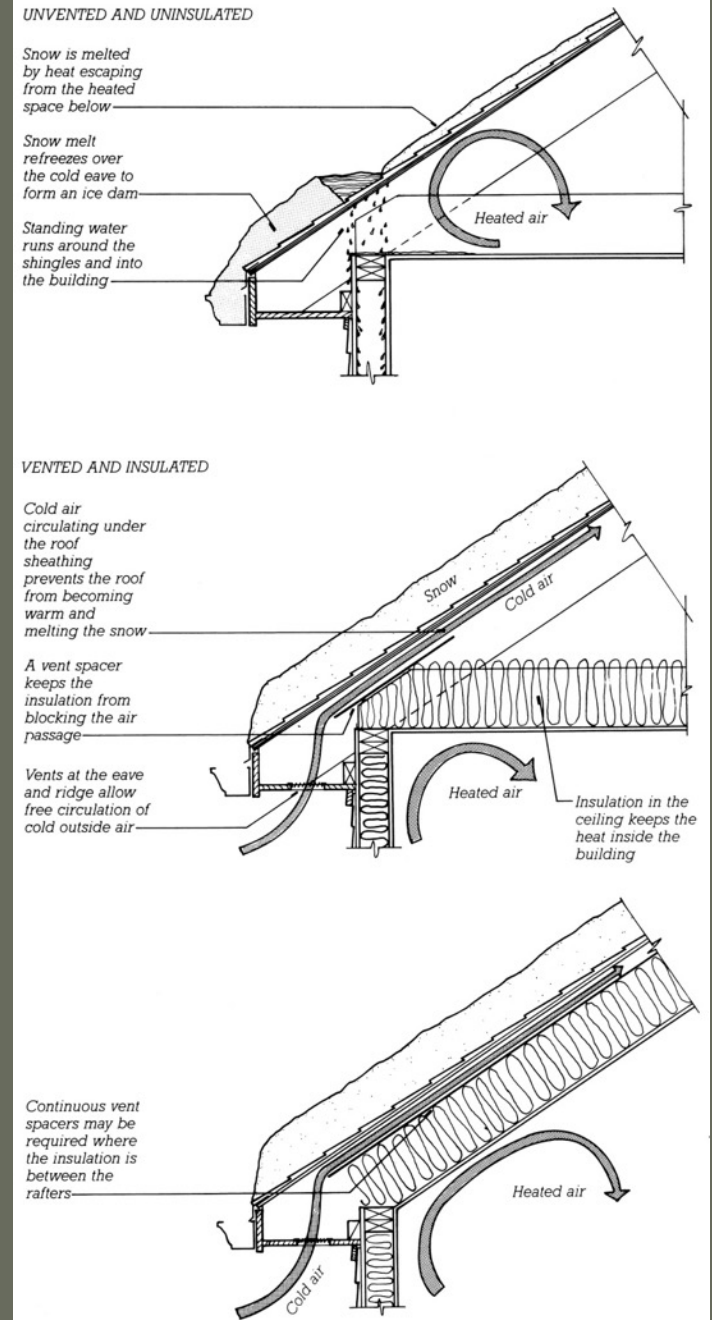
# Roof Ventilation



# Roof Ventilation

## Roof Ventilation

Ventilation under the sheathing and above the insulation helps to remove moisture that enters from above or condensation from below and reduces the risk of ice damming in cold climates.



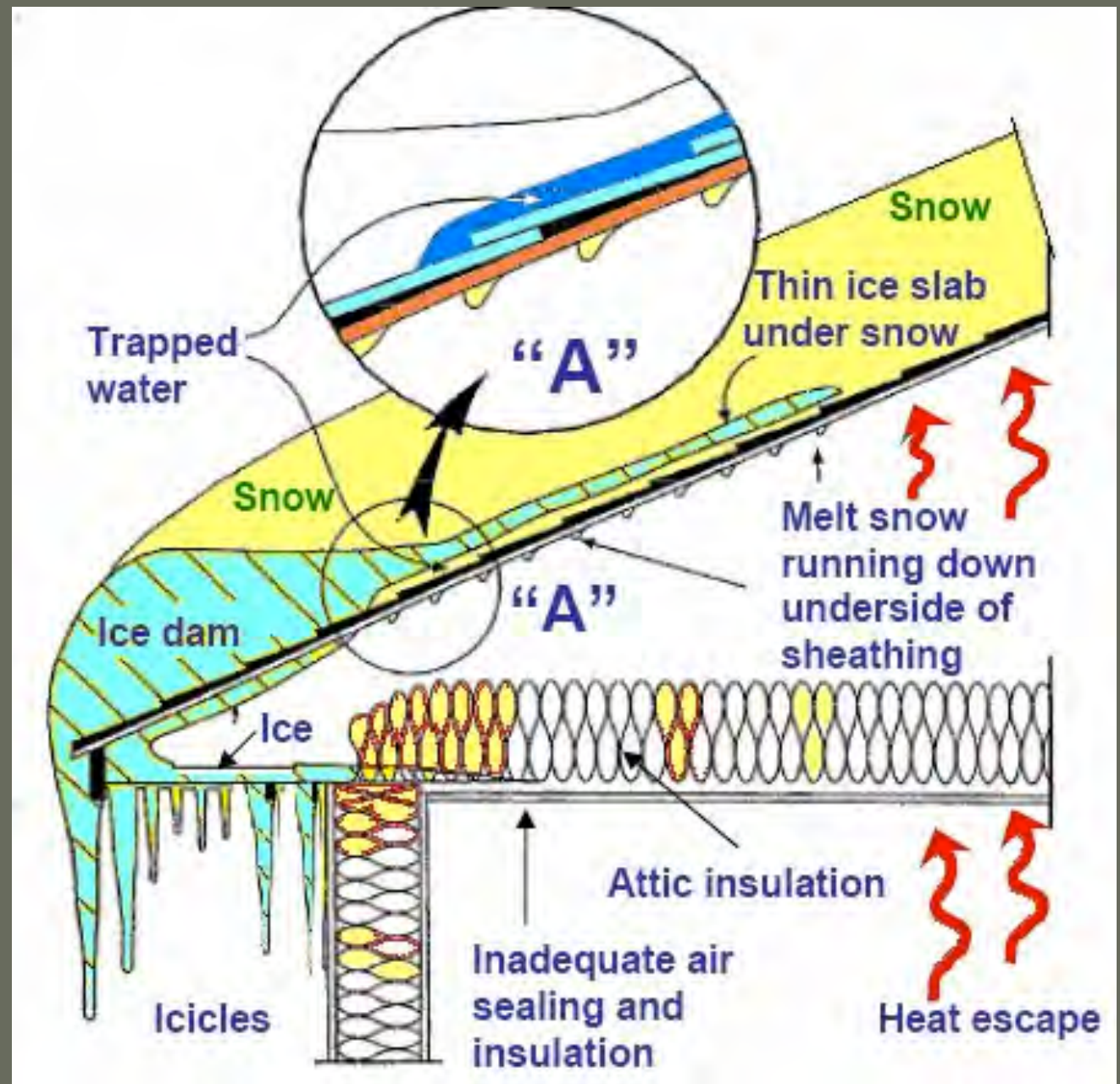


# Roof Ventilation: ICE DAMS



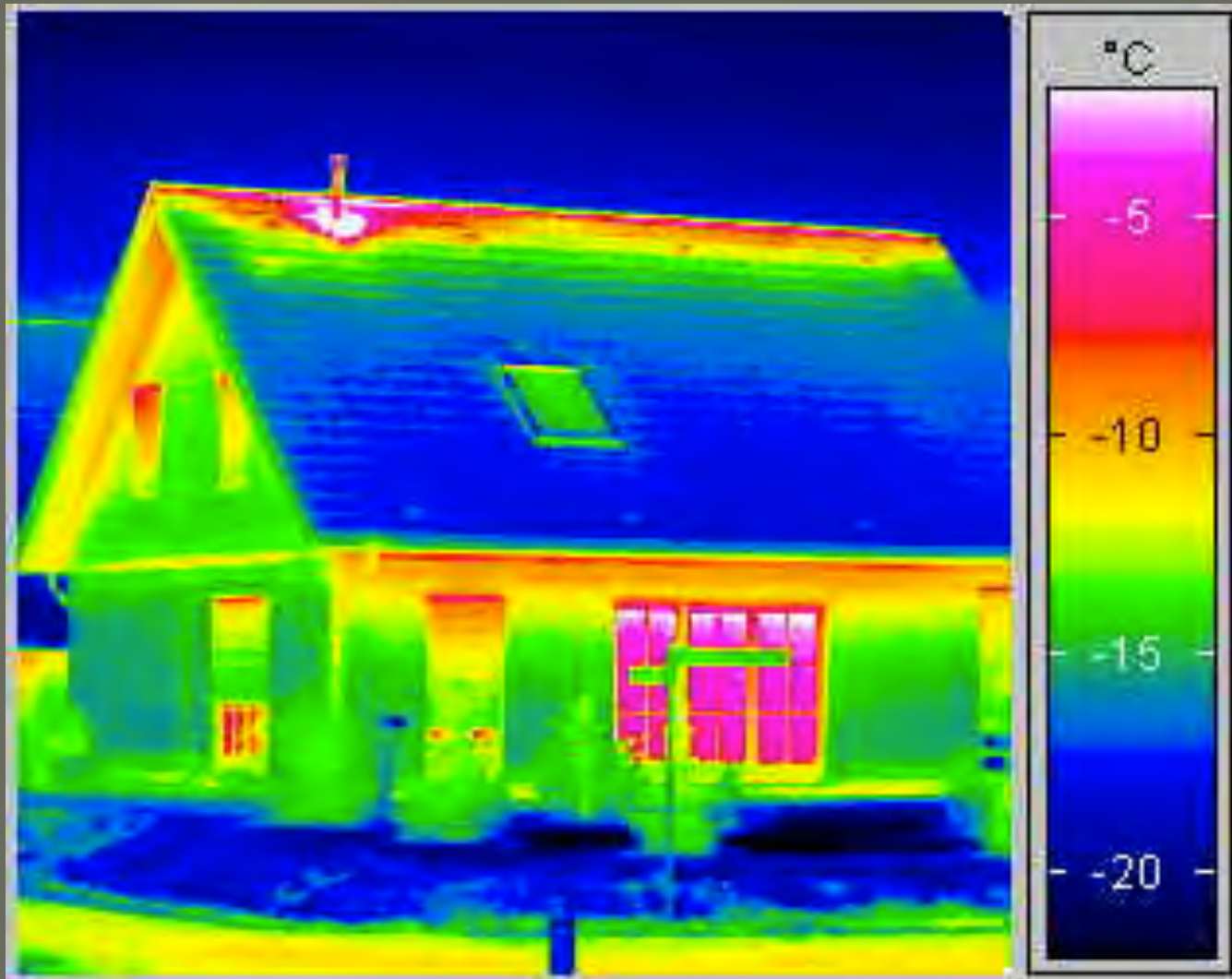
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# Roof Ventilation: Ice Dams





# Roof Ventilation and Insulation



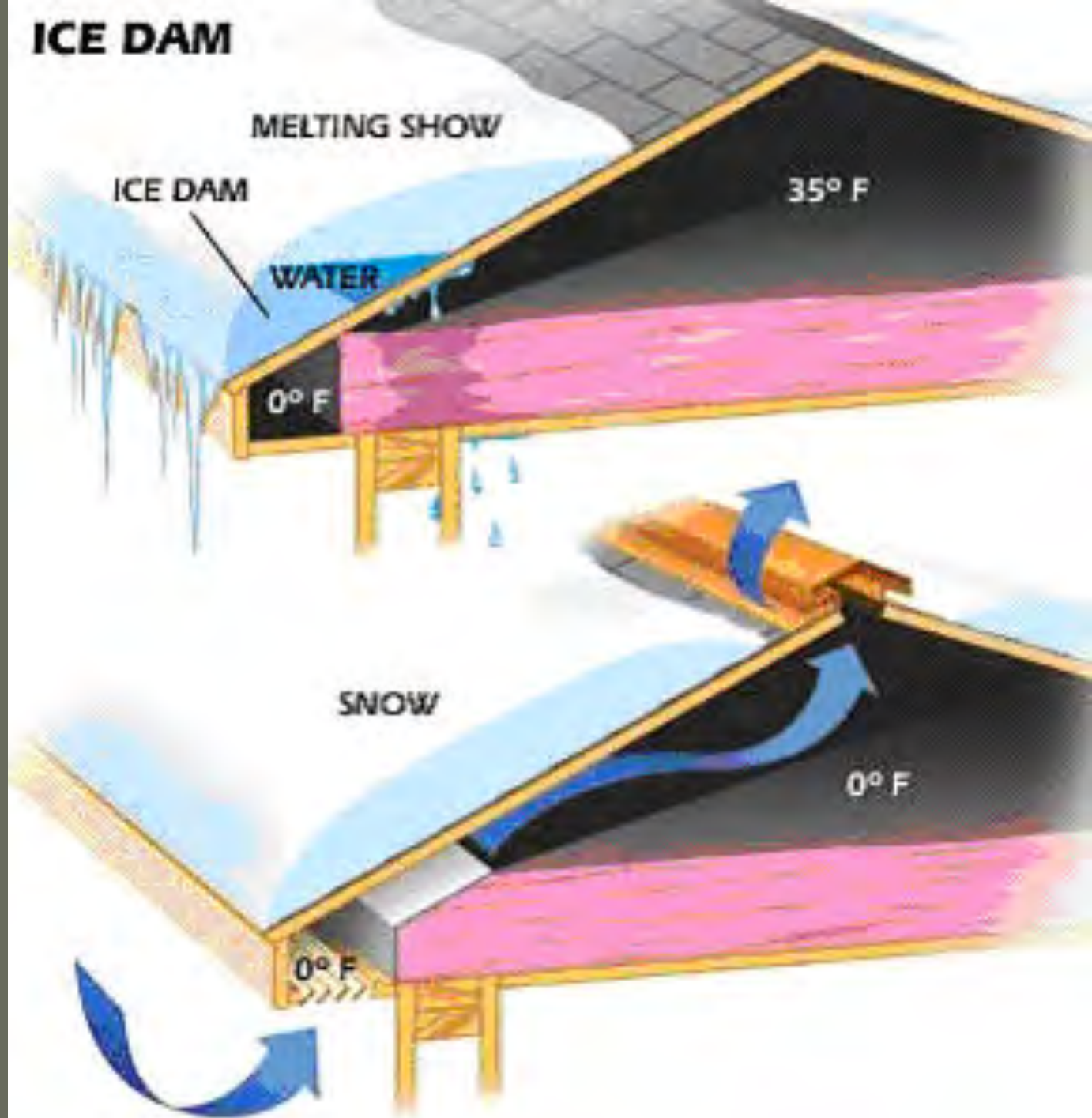


# Roof Ventilation and Insulation

Frost that formed overnight lingers on the colder overhanging portions of the roof while it has already melted over the heated spaces.



Roof  
Ventilation:  
Ice Dams  
Cold Roof Design



# Roof Ventilation

## *Soffit Vent*

Continuous soffit vent with insect screen provides air flow below the roof sheathing and above the roof insulation





# Roof Ventilation

## *Gable Vent*

Louvered Gable Vent allows ventilation through attic space, keeping roof temperature similar to outside air temperature.



# Roof Ventilation

## *Ridge Vent*

Continuous ridge vent uses stack effect to draw air from eave vents up along roof sheathing to the ridge.



# Roof Ventilation

## *Roof Vents*

Individual vents are spaced to provide ventilation up the roof from the eaves.





# Unvented Roofs

- When insulation is positioned above the roof deck or sheathing, ventilation is not required.
- Recent building code changes also allow air-impermeable spray foam insulation to be installed directly to the underside of roof sheathing.



# Unvented Roofs

- In this photo, spray foam insulation is applied to the underside of the roof sheathing, completely burying the top chords of the roof trusses.
- Assemblies with spray-foam insulation are more resistant to air leakage than assemblies with conventional batt insulation, creating the potential for reduced energy consumption for heating and cooling.





# Roof Finishes

## *Asphalt Shingles*

*(a.k.a. composition shingles)* are the most common residential roofing material.





# Roof Finishes

## *Wood Shakes (split)*

Natural finish gives strong character to building as it ages.



# Roof Finishes

*Wood Shingle  
(sawn)*

Natural finish  
gives strong  
character to  
building as it  
ages.





# Roof Finishes

*Concrete and  
Clay Tile*

Heavy and  
durable tile





# Roof Finishes

*Clay Tile*

Heavy and  
durable tile



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# Roof Finishes

*Coated Metal*



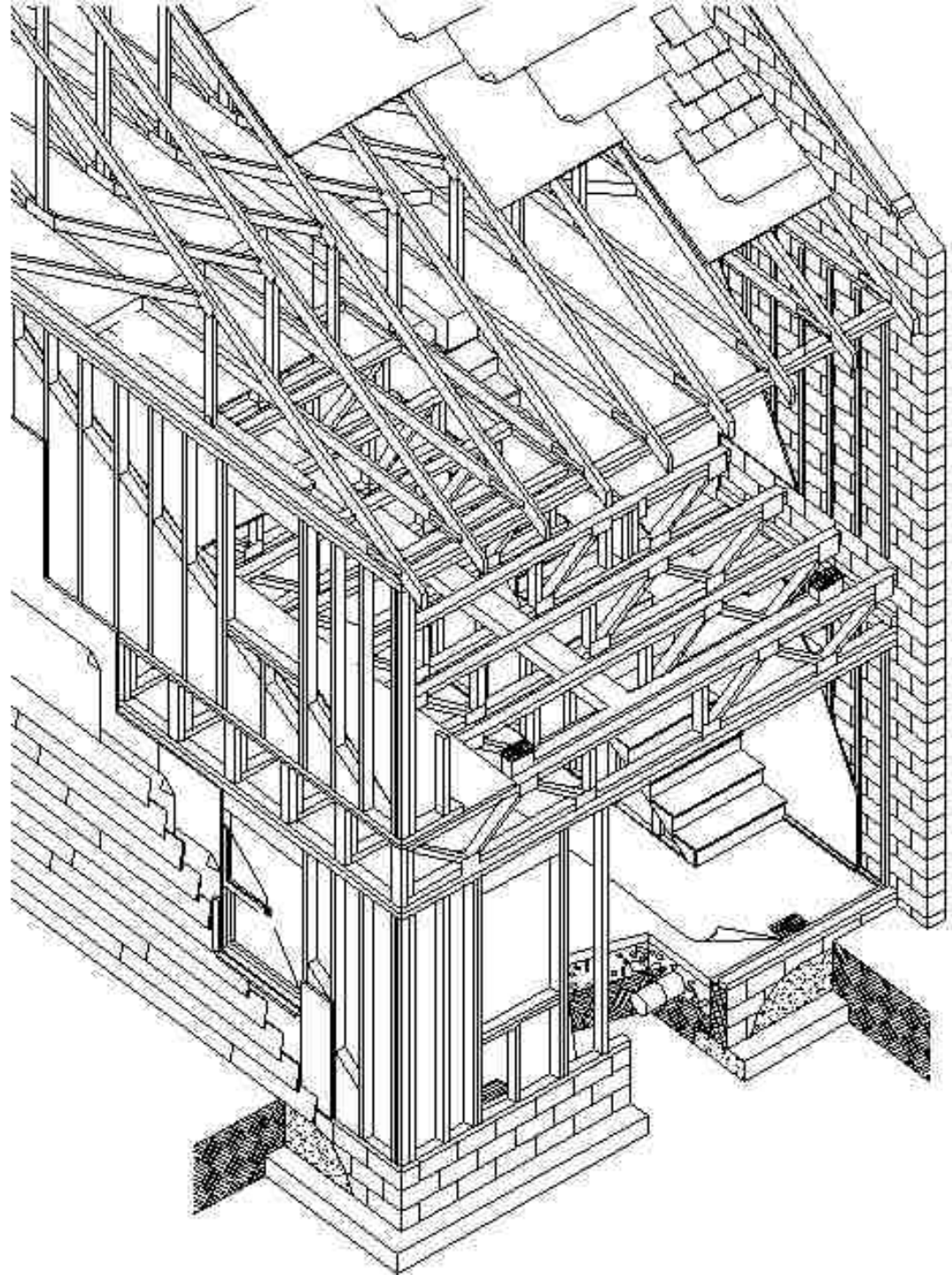
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**EXTERIOR WALLS,  
WINDOWS AND  
DOORS**



# Wall Framing and Sheathing



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# Exterior Wall Building Wrap

Building Wrap provides protection from:

- Moisture Penetration
- Air Penetration
- Wrap May Allow Water Vapor to pass through





# Wall Moisture Barrier

- Materials include *building felt* (above), *asphalt-saturated paper*, and *synthetic house wrap* (below).
- Synthetic wraps also contribute to reduced air leakage through the walls.
- Like roofing underlayment, these materials should be installed from the bottom up, in shingled fashion.







# Flashing

- Window flashing work in progress.
- A self-adhered bituminous flashing and soldered copper sill pan at window sill



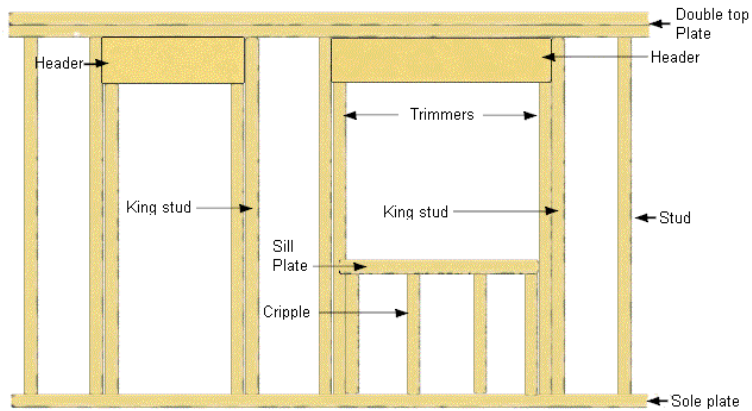
# Flashing

- A nail flange window is installed into a rough opening flashed with a synthetic fabric flashing.
- Note how the top flashing strip laps over the nailing flange, while the side and bottom strips lap under.





# Window Installation: Framing



Components of a framed wall  
Showing rough door and  
window openings

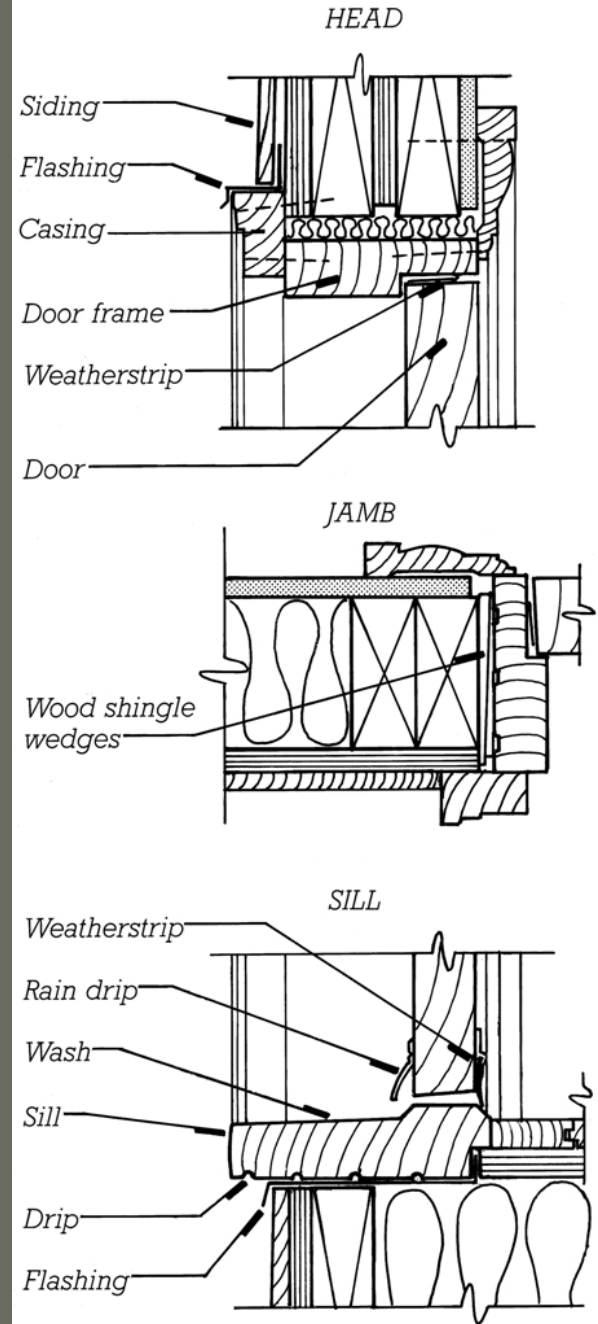


# Installing Windows & Doors

- The *shim space* between the rough opening and the finish door frame allows for precise plumbing and squaring of the frame.
- The shim space should be filled with insulation or closed with sealant to reduce the leakage of air and heat at this juncture.
- (Moisture barrier is omitted from drawing for clarity but is required in actual construction.)

## *Terminology:*

- Head flashing and sill flashing (sill pan)
- Tapered shims or shingle wedges
- Exterior casing
- Door frame
- Sill
- Interior trim



# Window Installation



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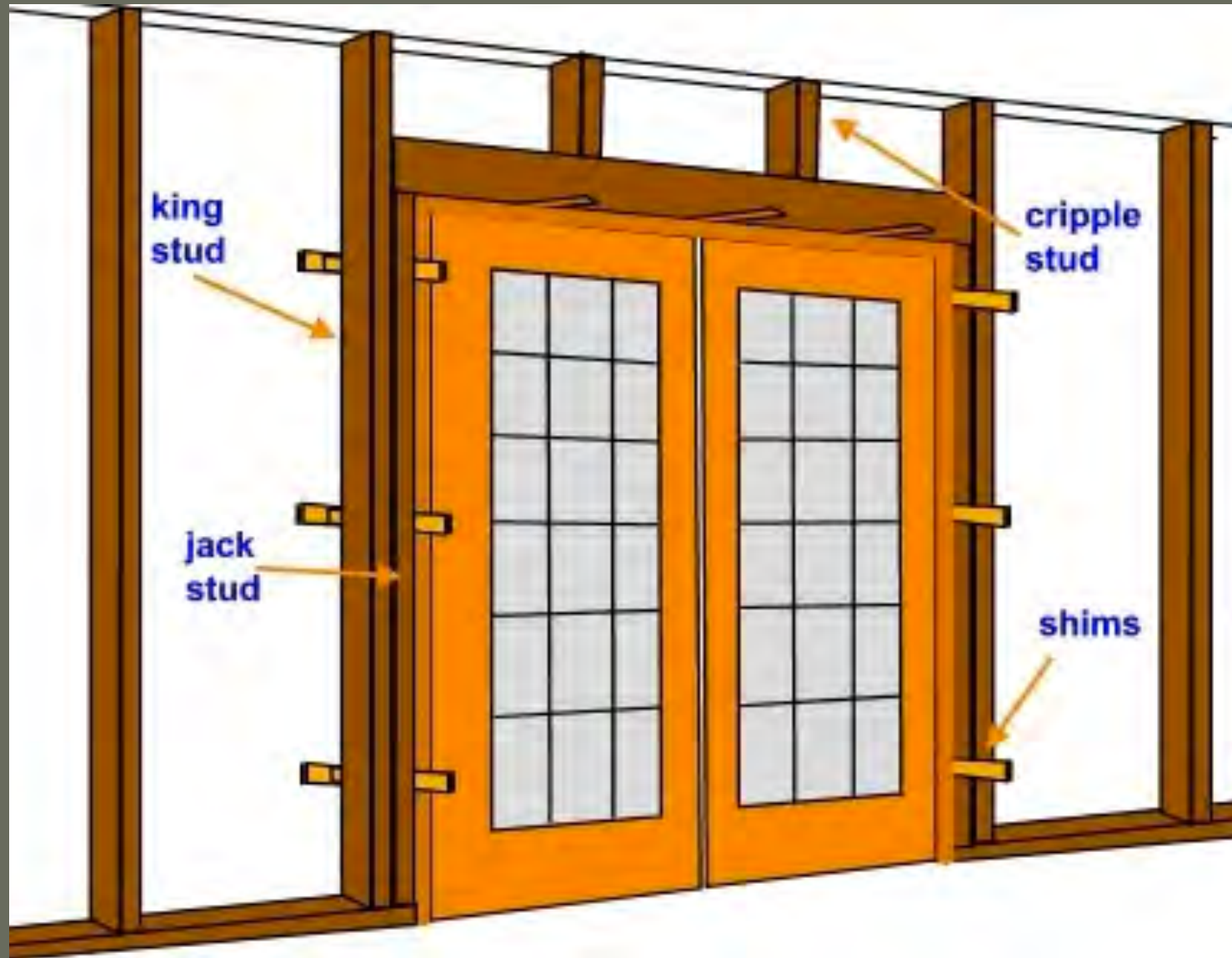


# Window Installation



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# Door Installation





# Window Install.

- A pair of wood windows are installed into a rough opening (viewed from the interior).
- The vertical 2x4 between the windows provides nailing and support for the windows.







# SIDING

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# OLD FAITHFUL INN YELLOWSTONE NATIONAL PARK



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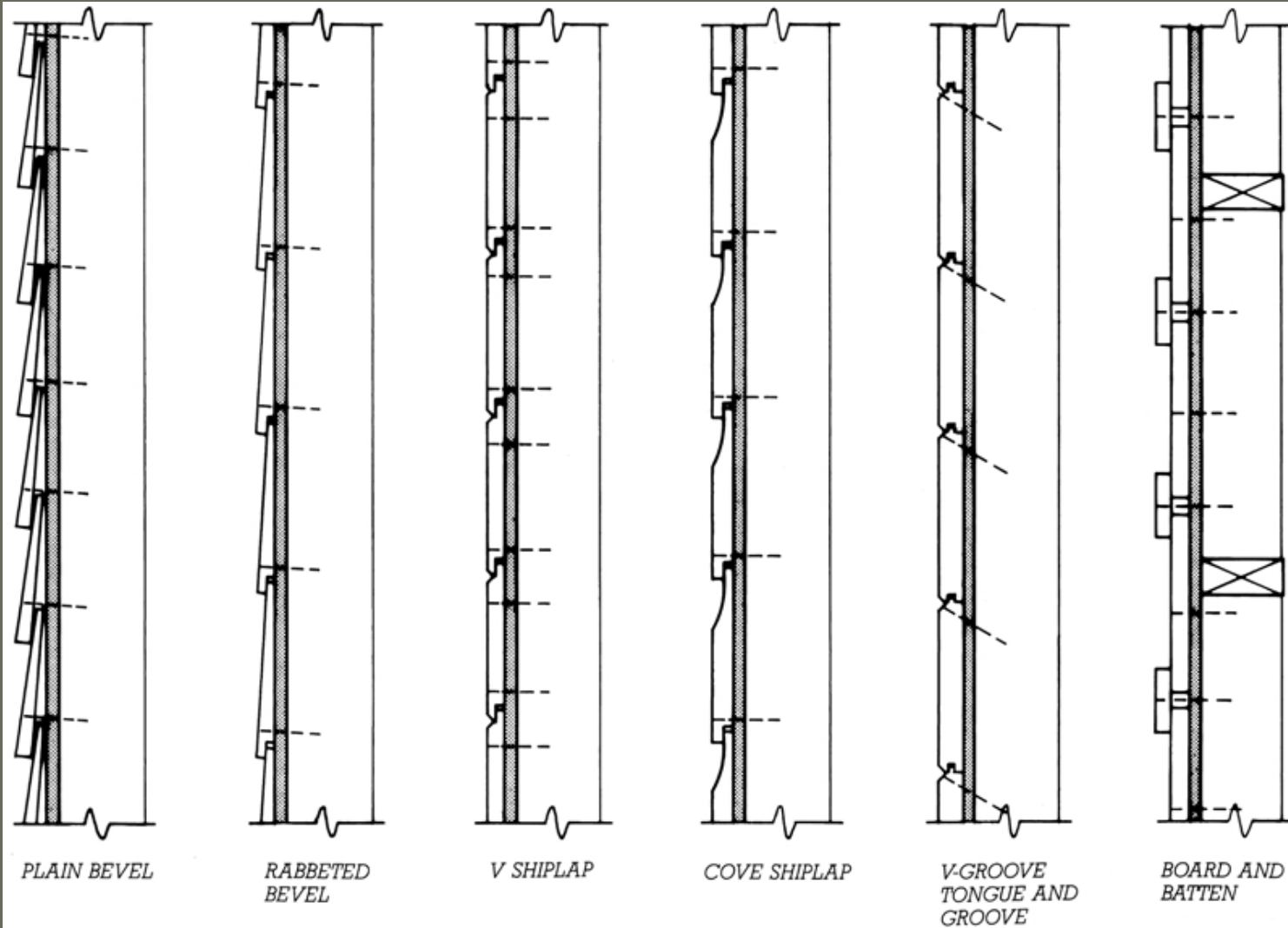
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# Siding

## *Board Siding*

Note attachment and overlap provisions that allow expansion and contraction of boards.



# Siding

Painted wood  
clapboard  
installation over  
synthetic house  
wrap



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# Siding

Horizontal board siding with mitered corners (left) and corner board (right)





# Siding

## *Shiplap Boarding*

Finished shiplap horizontal board siding with stain finish



# Siding

## *Stucco*

Close-up of stucco work in progress around a garage opening: to the right, the first *scratch coat*, and to the left, the second *brown coat*



# Siding

Fiber-cement panel  
siding adjacent to  
cast-in-place  
concrete





# Mock Up

A mockup at the construction site is used to verify selections of roofing, siding, and related exterior finish materials, as well as construction methods and quality, prior to actual construction.



# Decks and Railings

- Most exterior finish carpentry is complete.
- A wood porch deck, railings, and stone veneer base for columns and walls are yet to be installed.





# Special Treatments

Stainless steel flashing protects the top surface of an exterior glu-lam beam from direct exposure to rain.





# Exterior Finishes Summary:

## Weather Protection

Water

Ice, Snow

Air penetration

UV protection

## Details are the Key to Success

## Material Characteristics

Each material reacts differently to the elements

