

Arch 1240 Methods of Construction in Architecture
Professor Jason Montgomery

Windows and Doors (CHAPTER 18)

Windows

Manufacture

Types /Operation

Frame Materials

Glazing Units

Single / double glazed

Installation

Rough Opening / masonry opening

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Windows and Doors (CHAPTER 18)

Doors

Exterior / Interior

Materials

Wood, Steel

Fire Doors

Egress Doors

Safety,

Wind Loads, Impact Resistant

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WINDOWS
AND THE
POETRY OF LIGHT

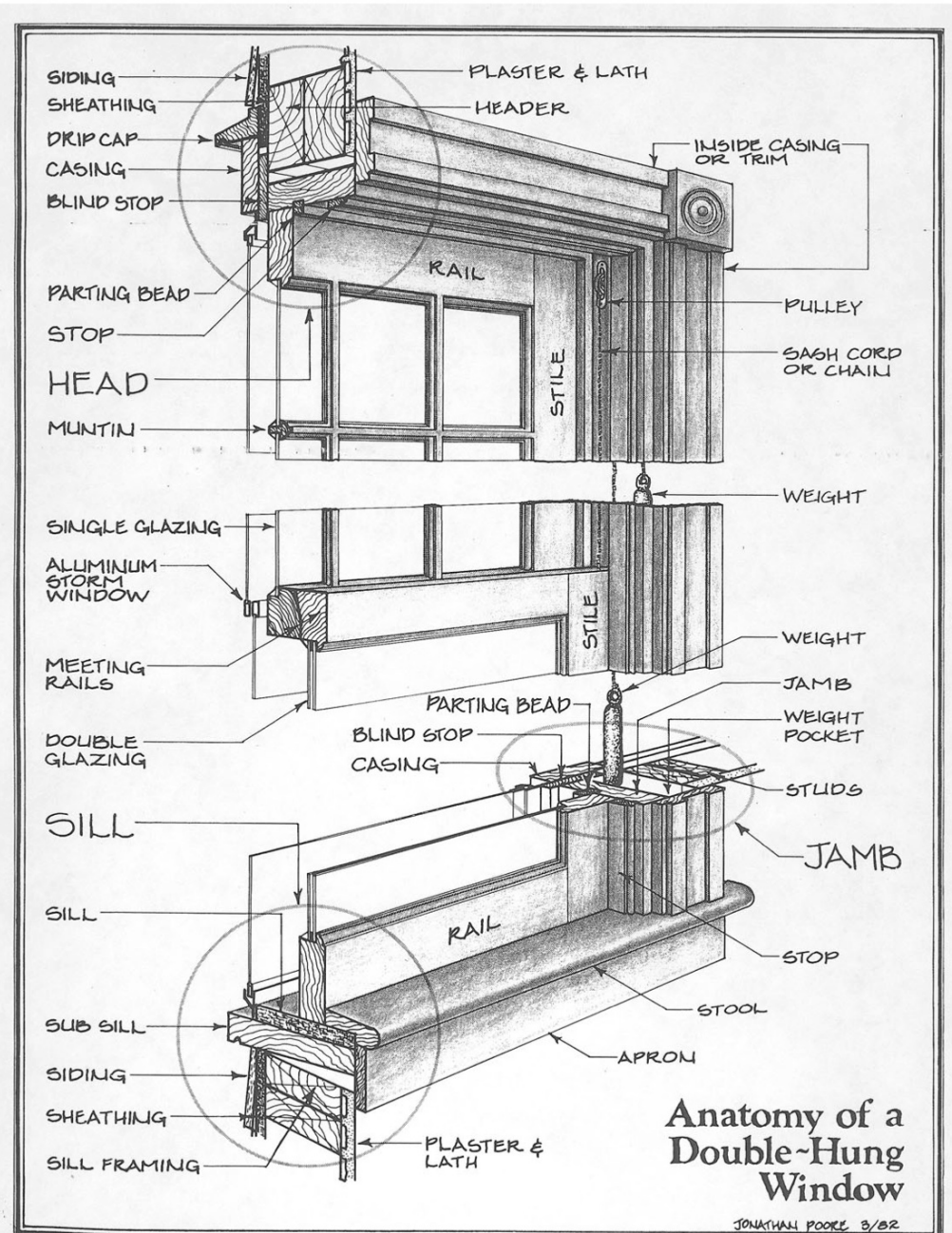


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COMPONENTS OF A WINDOW





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SASH DETAIL SHOWING GLAZING OF INSULATING GLASS UNIT



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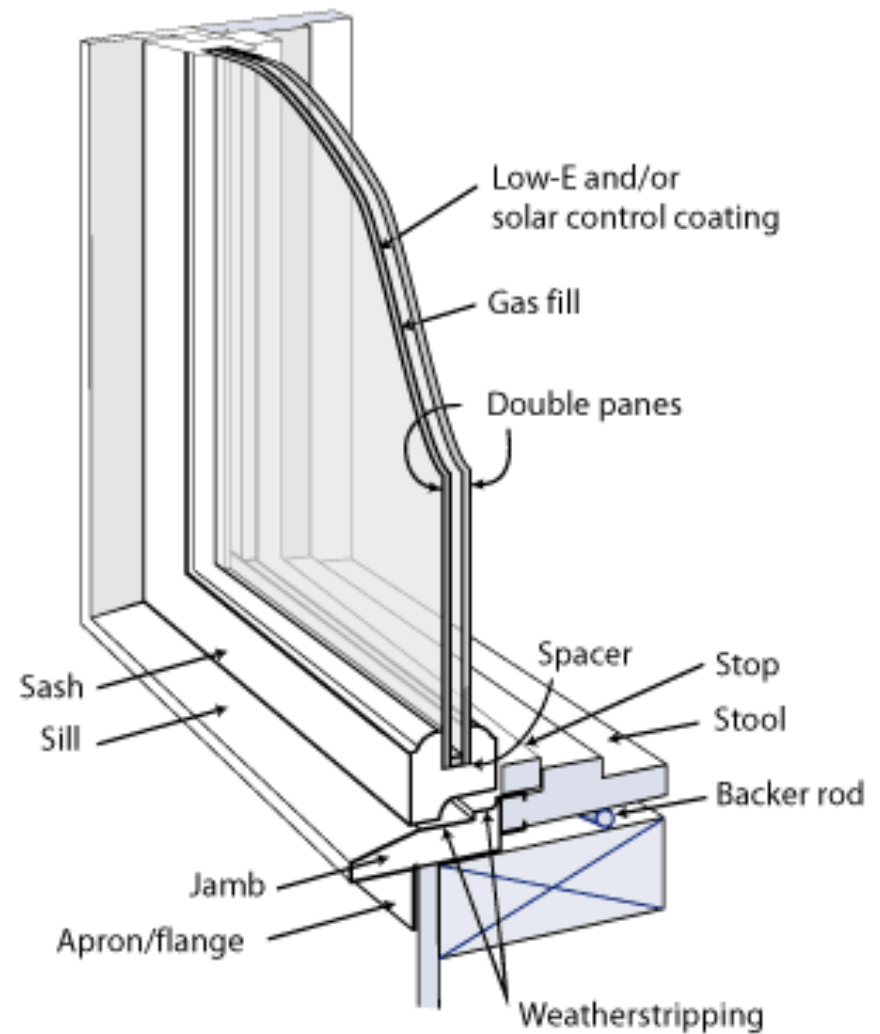
INSULATED GLASS



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Window Technologies

Energy-efficient window technologies are available to produce windows with the U-factor, SHGC, and VT properties needed for any application.



NFRC VALUES

NFRC Unit Values					
Glazing Type	U-Factor	Solar Heat Gain Coefficient	Visible Light Transmittance	Condensation Resistance	Energy Star
French Casemaster					
Size Tested	24 x 59	24 x 59	24 x 59	24 x 59	
Insulating glass	0.47	0.54	0.56	-	-
Insulating glass - SDL	0.47	0.49	0.51	-	-
Insulating glass - SDL with spacer bars	0.47	0.49	0.51	-	-
Insulating Low E II glass	0.35	0.29	0.49	-	N, NC, SC, S
Insulating Low E II glass - SDL	0.35	0.27	0.45	-	N, NC, SC, S
Insulating Low E II glass - SDL with spacer bars	0.36	0.27	0.45	-	NC, SC, S
Insulating Low E II glass - Argon	0.32	0.29	0.49	-	N, NC, SC, S
Insulating Low E II glass - Argon, SDL	0.32	0.26	0.45	-	N, NC, SC, S
Insulating Low E II glass - Argon, SDL with spacer bars	0.33	0.26	0.45	-	N, NC, SC, S
Insulating LoE ³ -366™ Glass	0.35	0.19	0.43	53	N, NC, SC, S
Insulating LoE ³ -366 Glass - Argon	0.32	0.19	0.43	57	N, NC, SC, S
Insulating LoE ³ -366 Glass - SDL w/Spacer Bar < 1"	0.36	0.18	0.39	53	N, NC, SC, S
Insulating LoE ³ -366 Glass - SDL w/Spacer Bar > 1"	0.36	0.16	0.35	53	N, NC, SC, S
Insulating LoE ³ -366 Glass - SDL w/o Spacer Bar < 1"	0.35	0.17	0.39	53	N, NC, SC, S
Insulating LoE ³ -366 Glass - SDL w/o Spacer Bar > 1"	0.35	0.16	0.35	53	N, NC, SC, S
Insulating LoE ³ -366 Glass - Argon, SDL w/Spacer Bar < 1"	0.33	0.17	0.39	57	N, NC, SC, S
Insulating LoE ³ -366 Glass - Argon, SDL w/Spacer Bar > 1"	0.33	0.16	0.35	57	N, NC, SC, S
Insulating LoE ³ -366 Glass - Argon, SDL w/o Spacer Bar < 1"	0.32	0.17	0.39	57	N, NC, SC, S
Insulating LoE ³ -366 Glass - Argon, SDL w/o Spacer Bar > 1"	.032	0.16	0.35	57	N, NC, SC, S
Insulating LoE ³ -366 Glass - GBG	0.35	0.18	0.39	53	N, NC, SC, S
Insulating LoE ³ -366 Glass - Argon, GBG	0.32	0.17	0.39	57	N, NC, SC, S

NOTE:

Product Values are determined using the National Fenestration Rating Council (NFRC) Procedures for determining fenestration product values.

U-Value: (Btu/hr-sq ft-°F) Lower the U-Value, the greater the resistance to heat flow and better its insulating value.

R-Value: (1/U-Value) Higher the R-Value, the greater the resistance to heat flow and better its insulating value.


Visible Light Transmittance (VLT): Percentage of visible light transmitted through the unit.

Solar Heat Gain Coefficient (SHGC): The lower a window's SHGC, the less solar heat it transmits, and the greater its shading ability.

Condensation Resistance (CR): Condensation Resistance measures the ability of a product to resist the formation of condensation on the interior surface of a product. The higher the CR rating, the better that product is at resisting condensation formation.

Capillary tubes are required for IG units at high elevations. Argon will not be furnished in units with capillary tubes.

Contact the Architectural Department Hotline at (800-346-3363) for additional NFRC Unit Values.



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Windows: Overview

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Awning

Awning windows are hinged at the top and open out like an awning. They're often placed above or below other windows—and over doors—for extra ventilation and light.

Wood	Vinyl	Fiberglass
Architect Series®	Centera by Pella™	Pella Impervia
Designer Series®	Encompass by Pella™	
ProLine®	ThermaStar by Pella®	

[View All](#)




Bay and Bow

Bay and bow windows are combinations of windows that reach out into the world. Even with limited wall space, they allow you to have more windows to capture the view.

Wood	Vinyl
Architect Series	Centera by Pella
Designer Series	Encompass by Pella
ProLine	ThermaStar by Pella

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Casement

Casement windows feature one hinged sash that swings out, welcoming the breeze in. These windows are coveted for their clean, uncluttered views and effortless operation.

Wood	Vinyl	Fiberglass
Architect Series	Centera by Pella	Pella Impervia
Designer Series	Encompass by Pella	
ProLine	ThermaStar by Pella	

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Double-Hung


Double-hung windows have two sliding sash providing efficient ventilation. Raise the lower sash to allow in a cool breeze. Lower the upper sash to pull hot air from the ceiling outside.

Wood	Fiberglass	Vinyl
Architect Series	Pella® Impervia®	Centera by Pella
Designer Series		Encompass by Pella
ProLine		ThermaStar by Pella

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Garden

Garden windows add light and architectural interest to any room. They're traditionally used over the kitchen sink for growing herbs and other houseplants.

Vinyl
Centera by Pella
Encompass by Pella
ThermaStar by Pella

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Single-Hung

Single-hung windows offer the same timeless style as double-hung windows but only the bottom sash is movable.

Wood	Fiberglass	Vinyl
Architect Series	Pella Impervia	Centera by Pella
		Encompass by Pella
		ThermaStar by Pella

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Sliding

A sliding panel allows for easy operation – an ideal choice for difficult-to-reach areas.

Fiberglass	Vinyl
Pella Impervia	Centera by Pella
	Encompass by Pella
	ThermaStar by Pella

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Special Shapes

Special shape windows are available in rectangular, curved and angled. They can be used by themselves or with other products, providing endless possibilities.

Wood	Fiberglass	Vinyl
Architect Series	Pella Impervia	Centera by Pella
Designer Series	Pella Special Shapes	Encompass by Pella
ProLine		ThermaStar by Pella

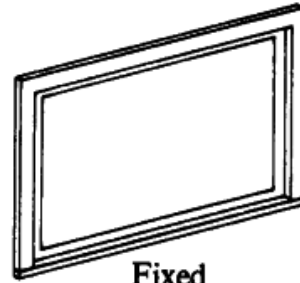
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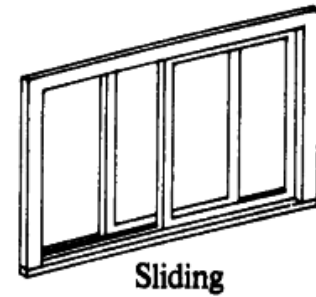
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Window Types

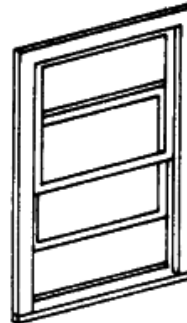
(based on operation)



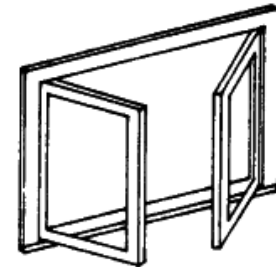
Fixed



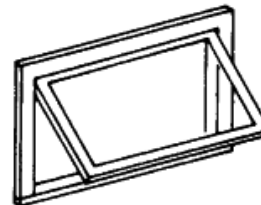
Sliding



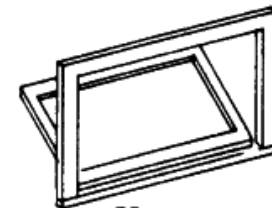
Double or single-hung



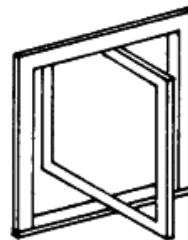
Casement



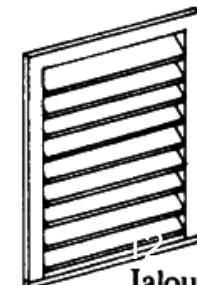
Awning



Hopper




Center pivot



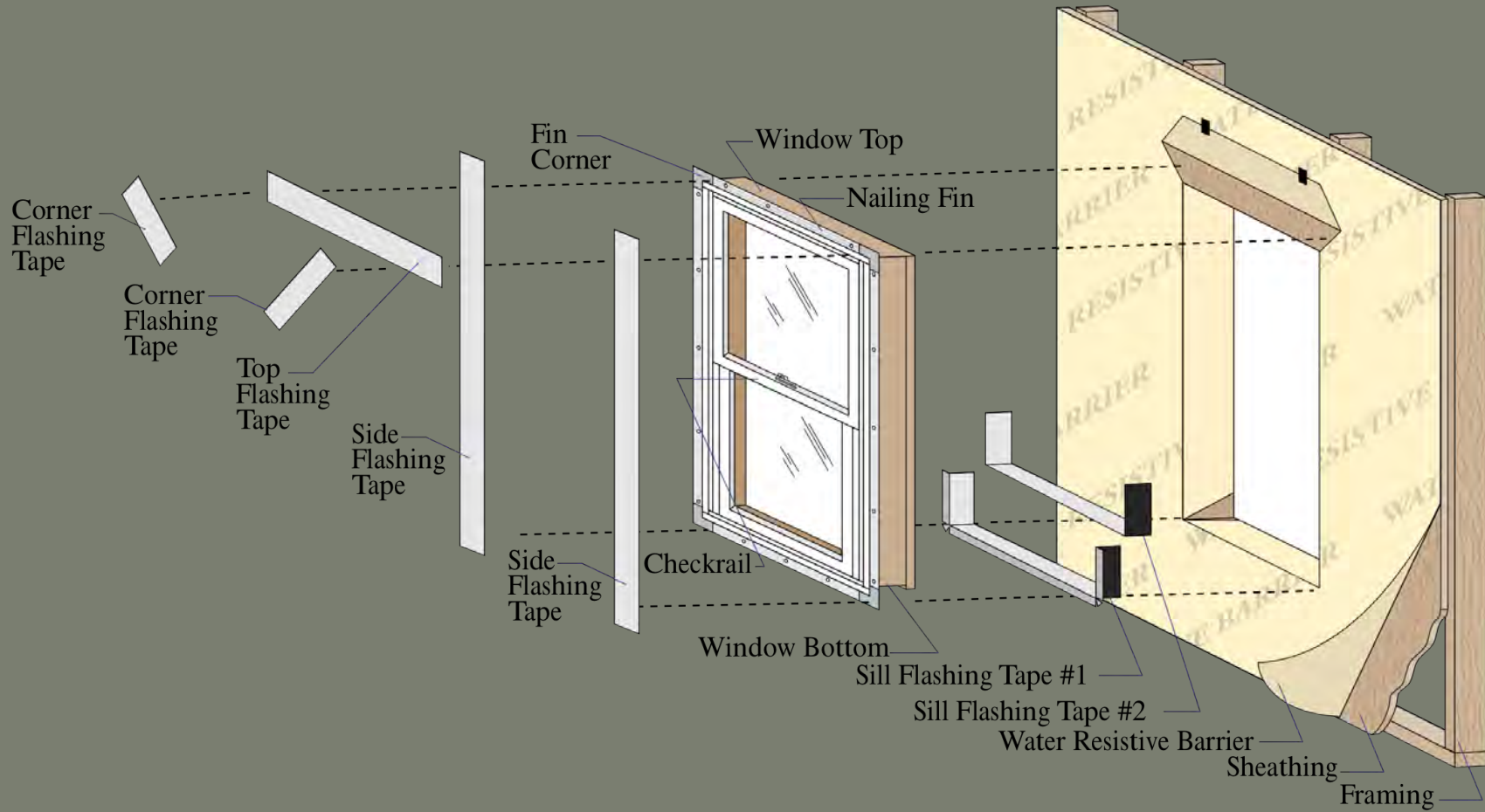
Jalousie

DO NOT use high pressure or latex foams

• Interior trim and/or jamb extensions (15 to 40 ft.)

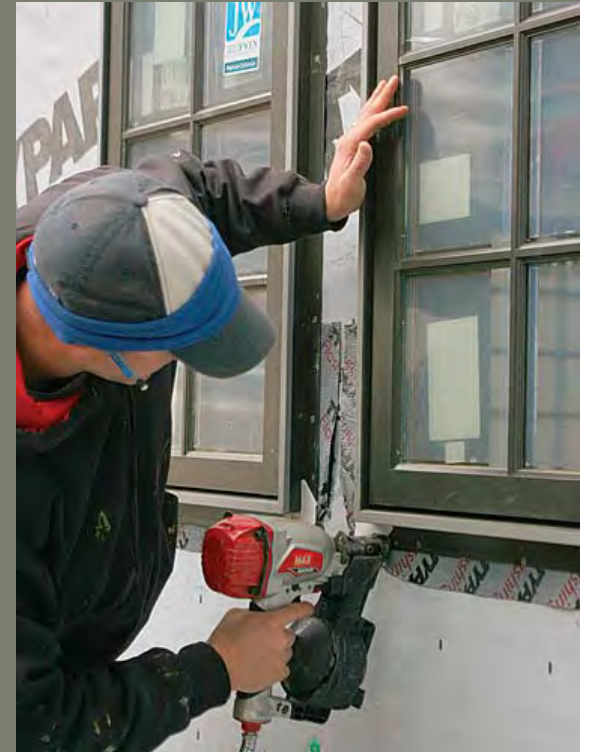
• Scissors or utility knife 

REMEMBER TO USE APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT.

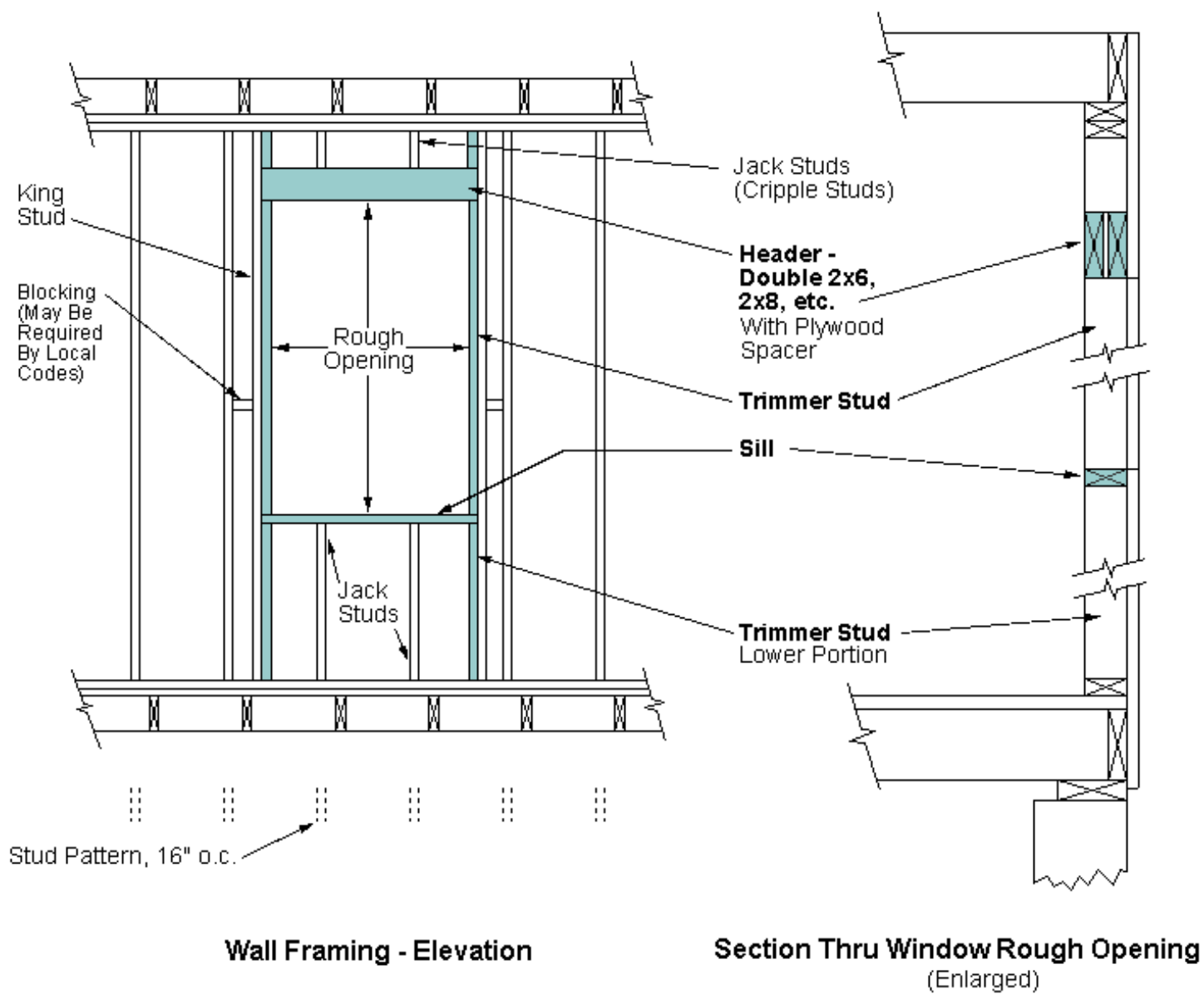


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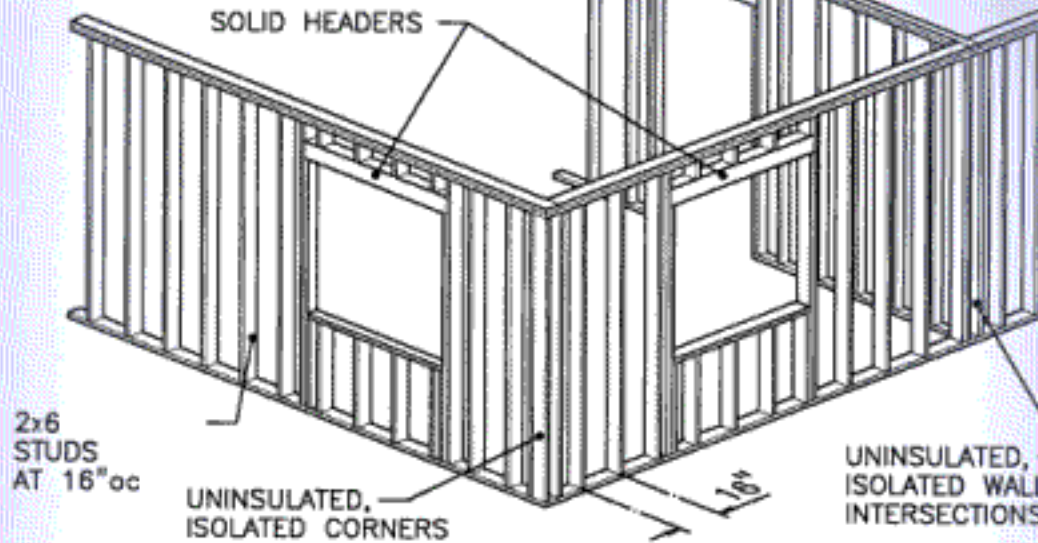
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Framing A Window Rough Opening

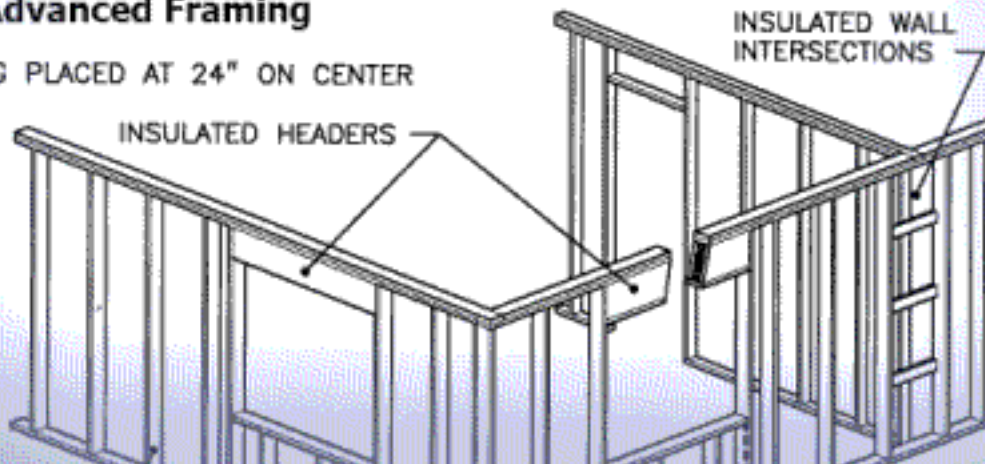
Standard Framing

FRAMING PLACED AT 16" ON CENTER



Advanced Framing

FRAMING PLACED AT 24" ON CENTER





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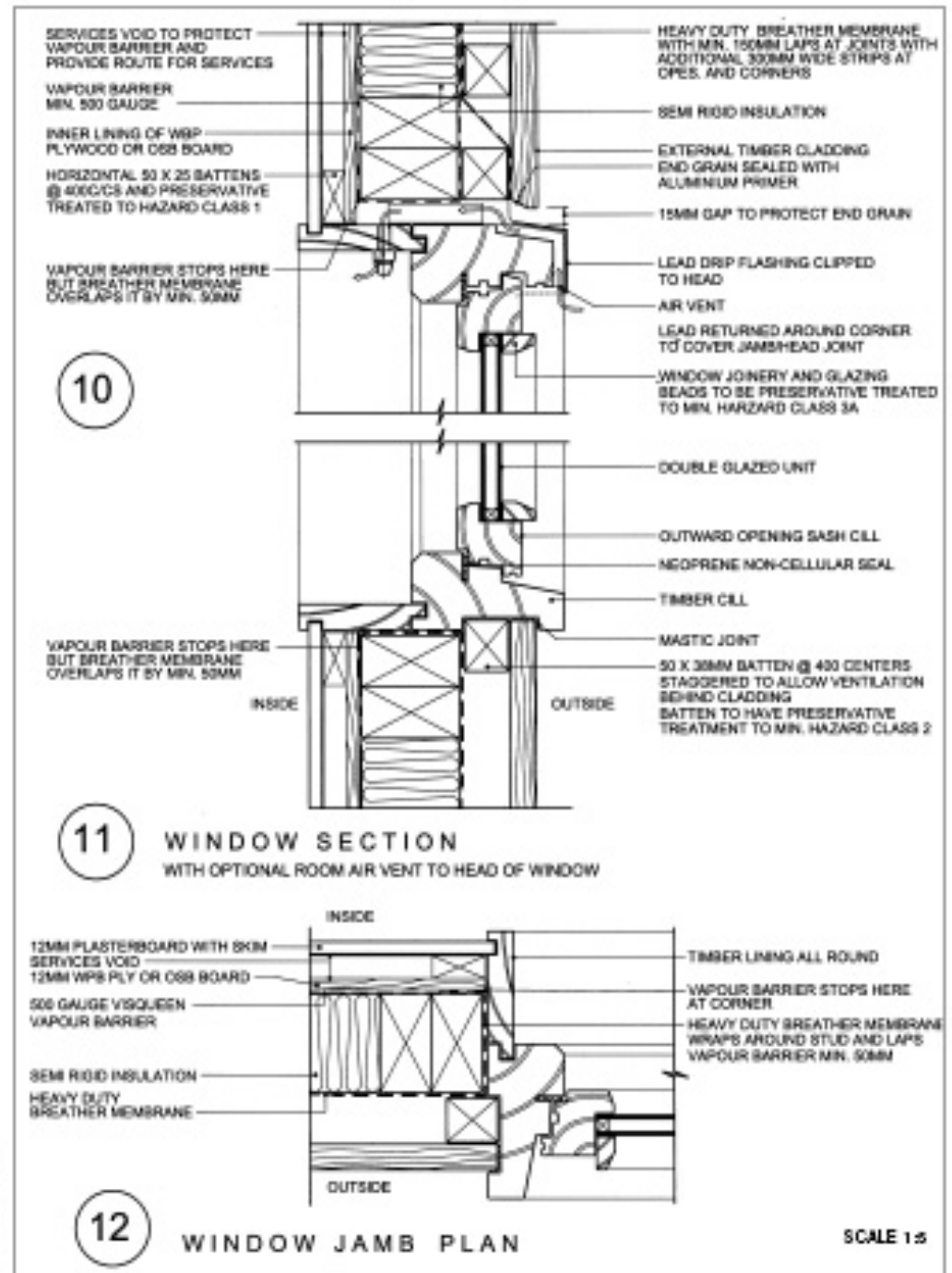


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WINDOW INSTALLATION IN A FRAMED WALL WITH WOOD SIDING

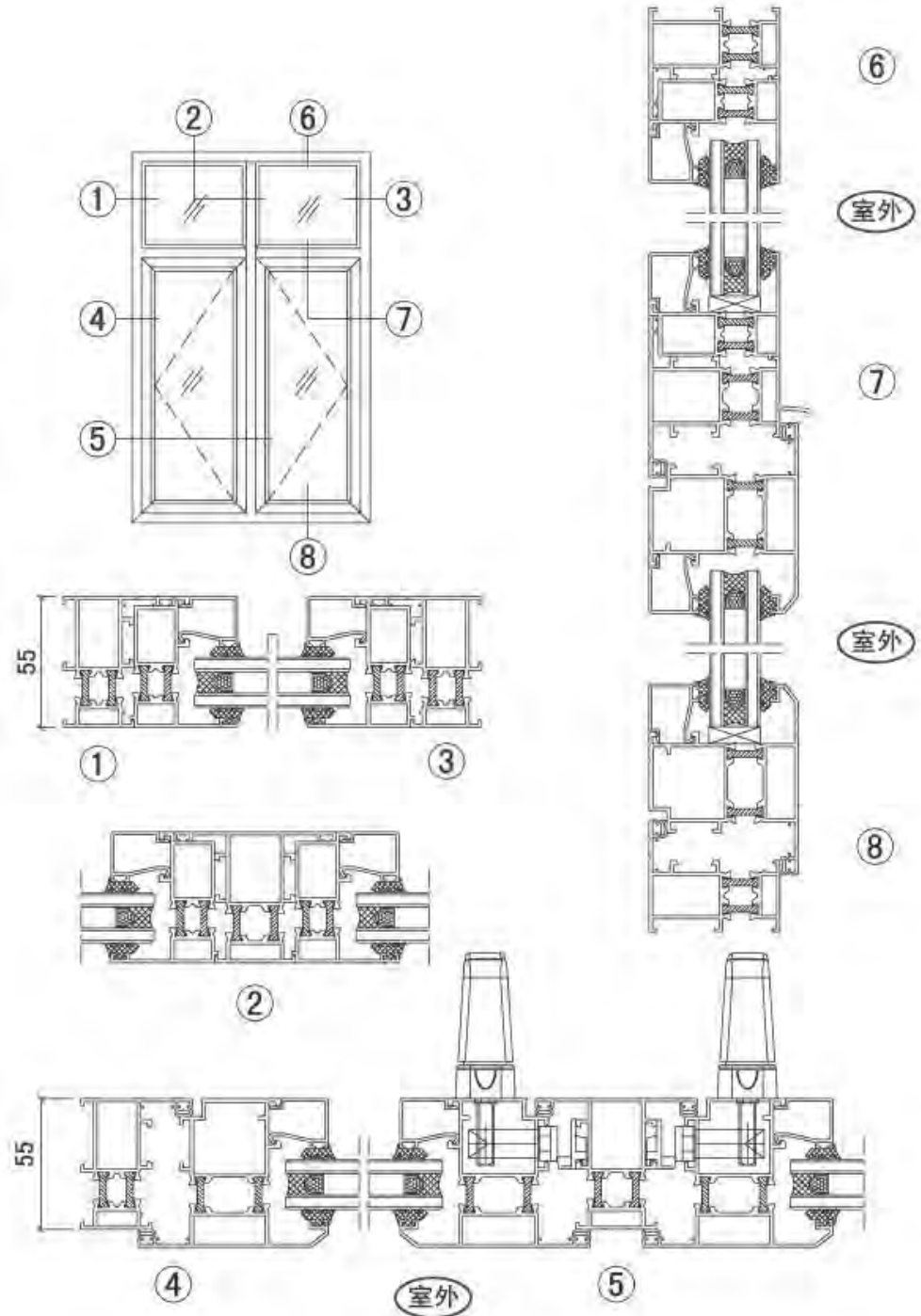


DETAIL B 1222

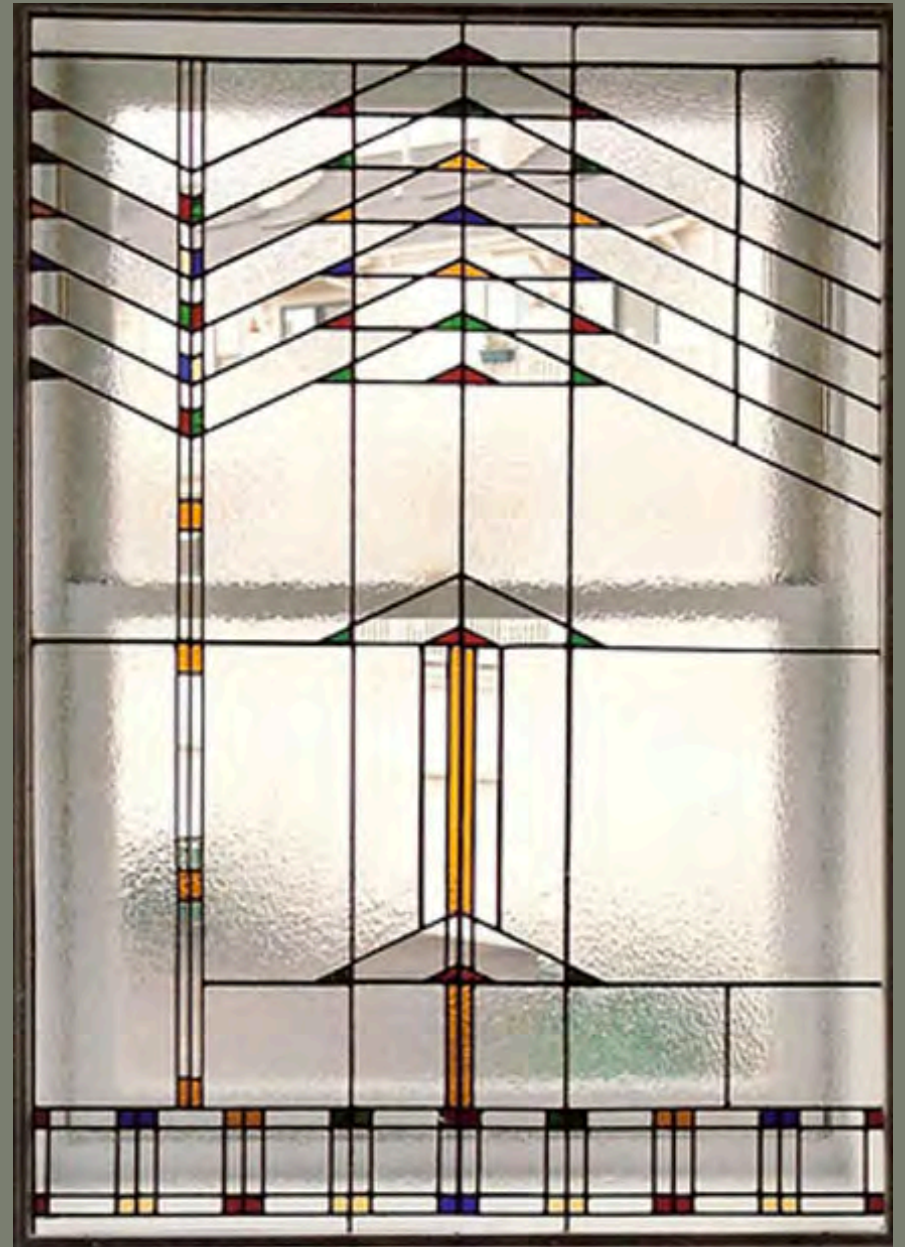


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“MULLED” WINDOW UNIT AND DETAILS



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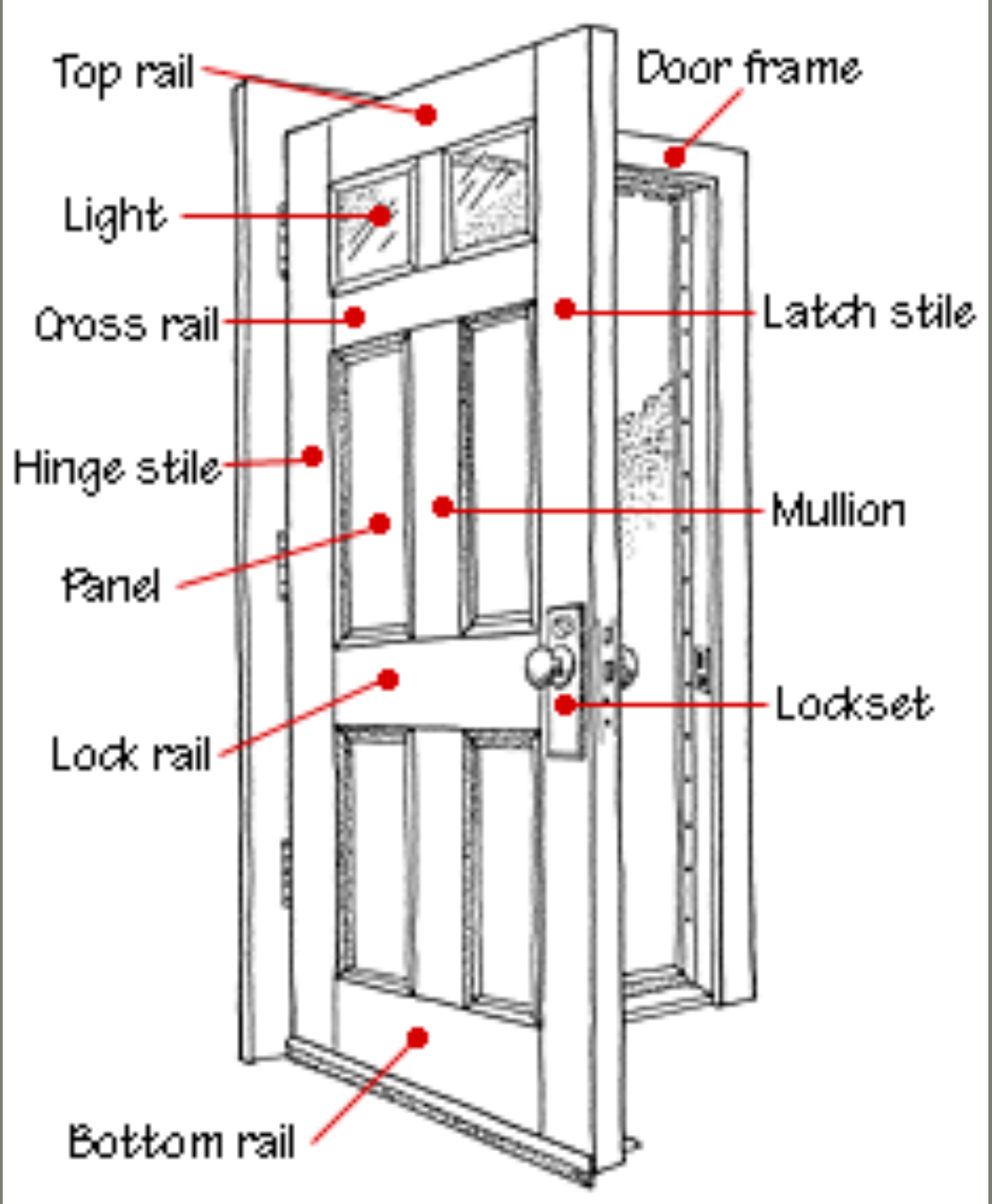
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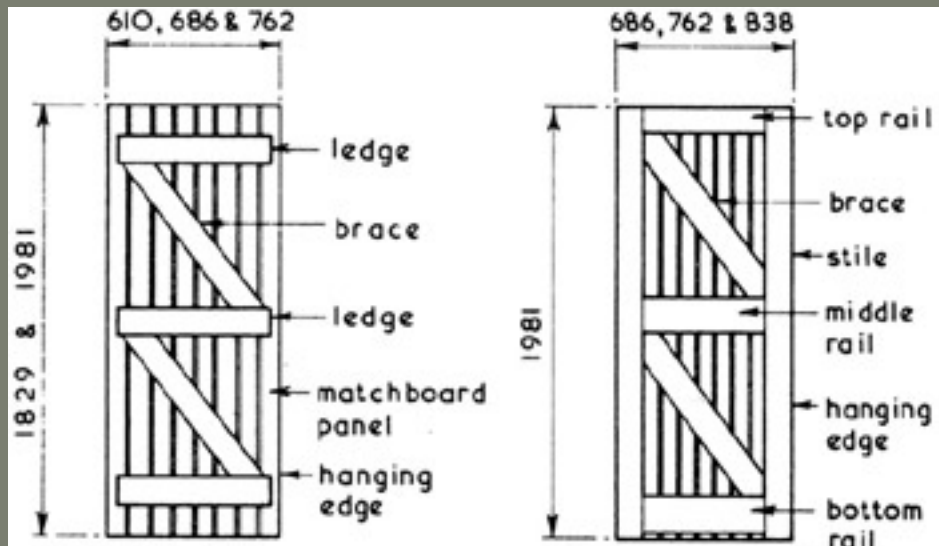
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COMPONENTS OF A WOOD PANEL DOOR

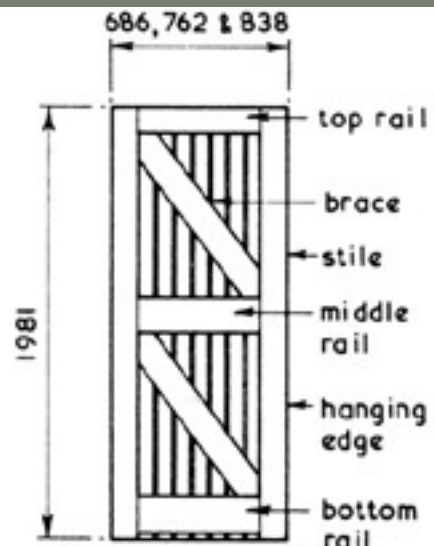


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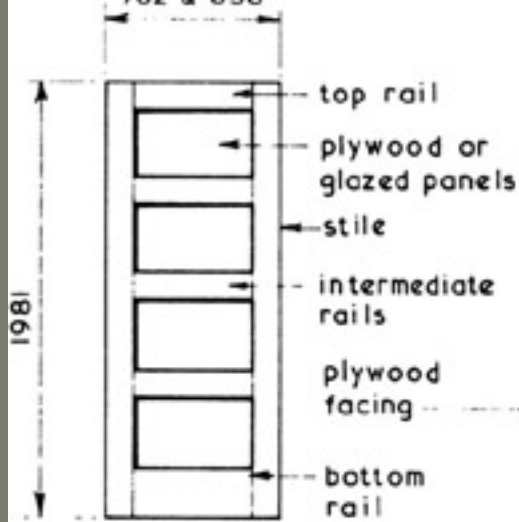
LEDGED AND BRACED DOOR

762 & 838

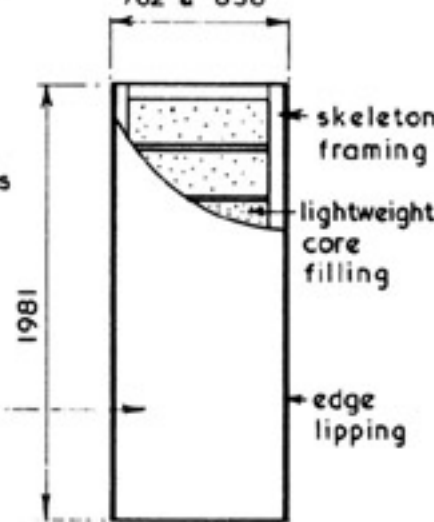


FRAMED LEDGED AND BRACED DOOR

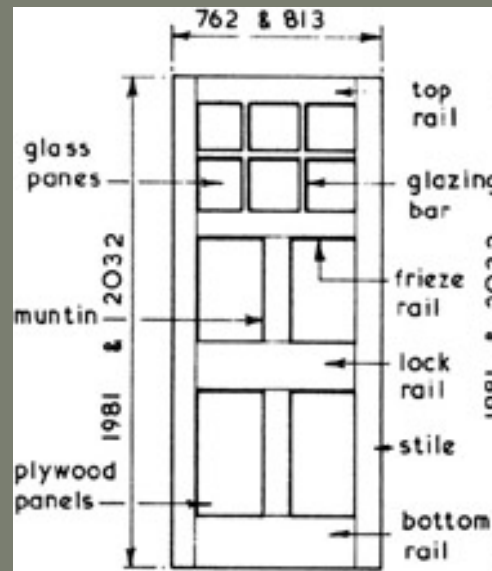
762 & 838



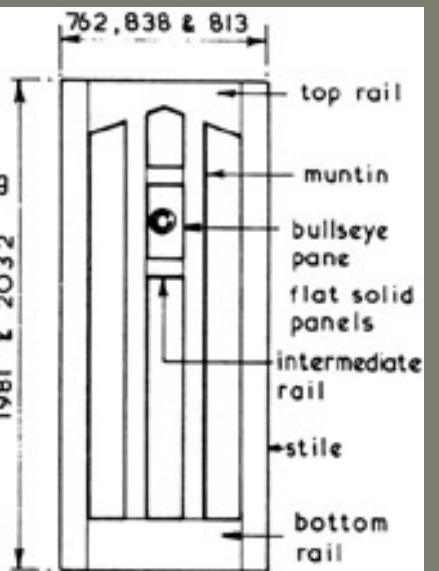
1, 2, 3 OR 4 PANELLED DOORS



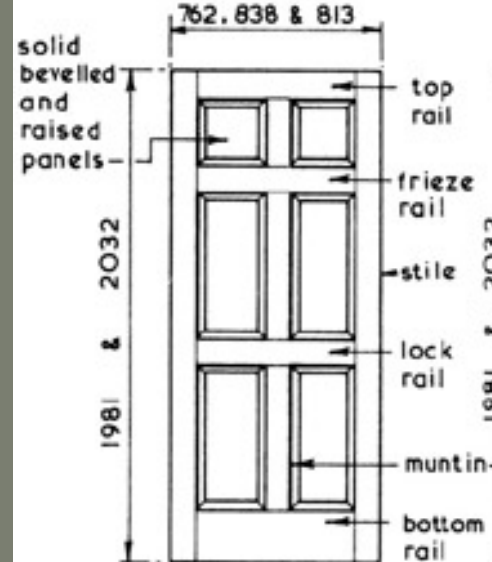
FLUSH DOORS



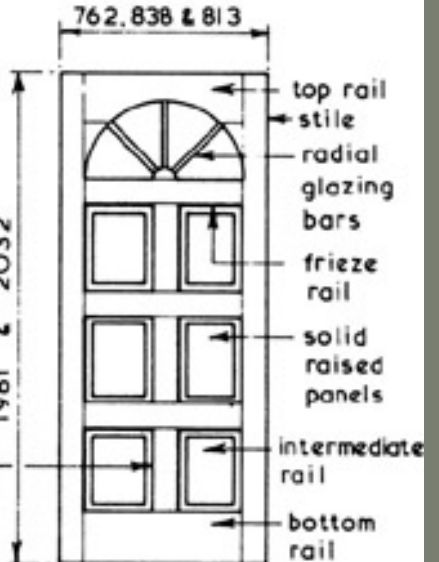
PURPOSE MADE



TUDOR STYLE



GEORGIAN STYLE



PURPOSE MADE



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F



FV



FR



FNV



HG



FG



FL



F2L



FGL



2FNV



HG2



FG2

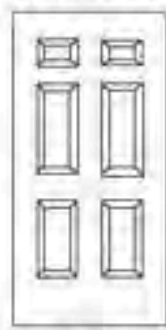
Paneled Doors



HG9



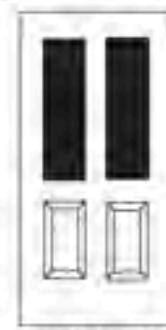
FD (Dutch)



E6



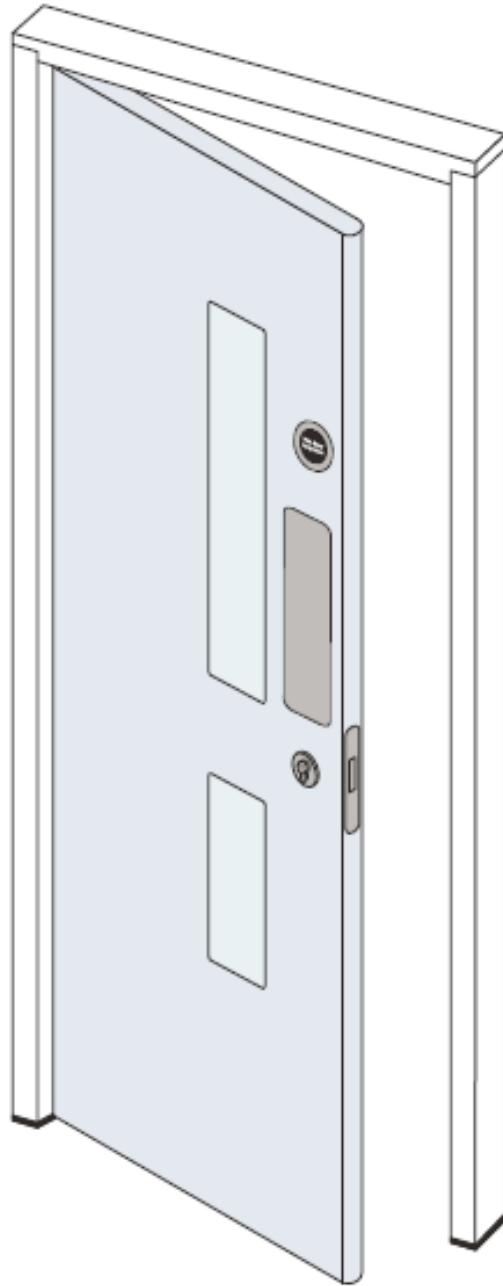
E62TL



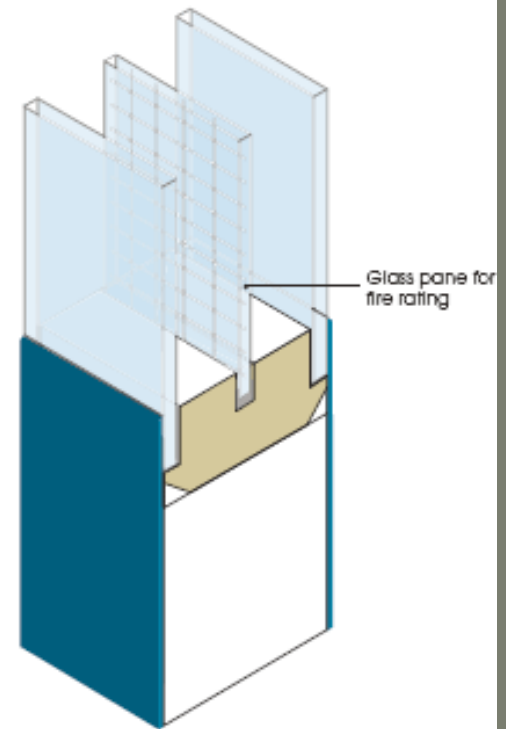
E6FNVS



E6HGS

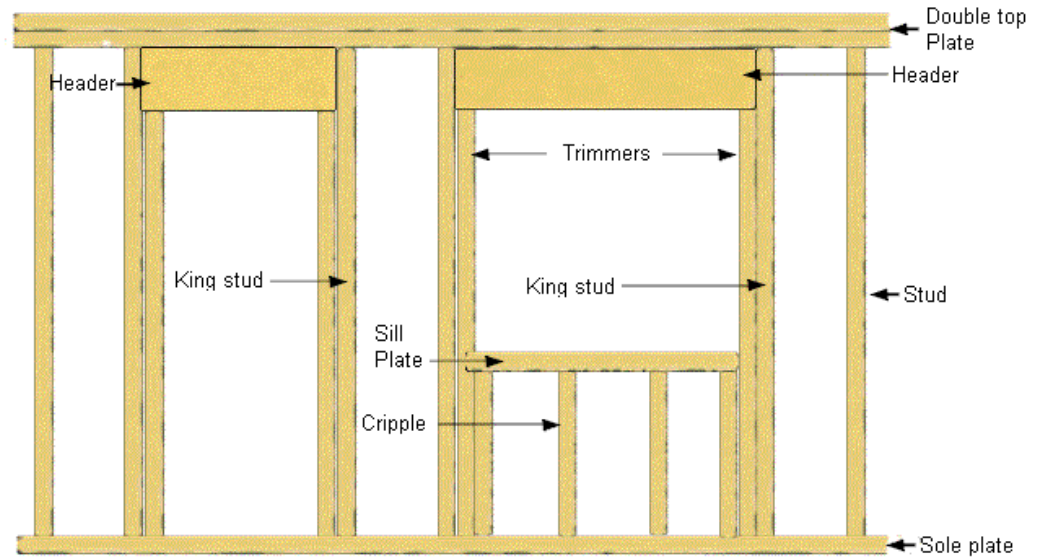


Duoglaze®



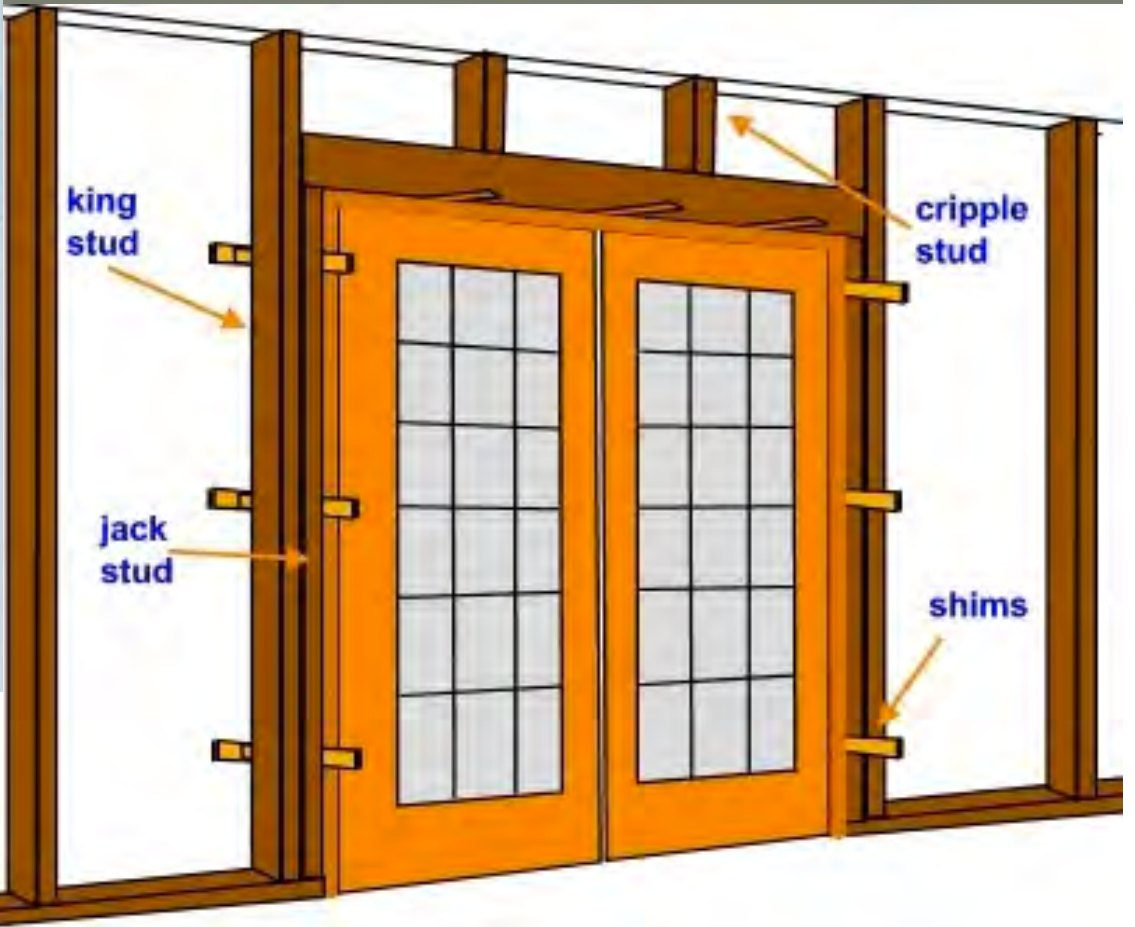
Patent No. 2233374

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Components of a framed wall
Showing rough door and
window openings

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Windows and Doors (CHAPTER 18)

Summary:

**Critical Interface b/w Interior
and Exterior**

Critical Performance Issues

**Vital / Central Element to
Architectural Character**