

## SPEAKING OF WINDOWS

Technical Note 16

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The origin of terms used to describe windows and their parts has its roots in the history of our buildings and our language. Colonial America referred to the lights, stool, and apron of their windows; these same terms are used today. The elaborate Palladian window has been used since the Italian Renaissance. Even a simple term, such as window sash, comes from the old French word *chasser*. Movable sash first appeared in England at Whitehall in 1685. No wonder, with this long history, we have trouble speaking the same language.

A reference for window style, terminology, and materials can, at least, supply a common vocabulary. Those who sell, design, or install windows will find here a valuable reference for windows and their parts. To provide an understanding of how glass, the most important element of a window, originated, we have included a history of glass. While the primary focus of this window reference is on residential applications, many of the terms relating to windows, such as condensation, window framing, solar gain, and heat loss, apply to windows used in any form of construction.

## HISTORY OF GLASS

Glassmaking began before recorded history. As early as 10,000 B.C., Neolithic man may have begun to craft small glass objects. Natural glass-like formations could have inspired his early efforts. Natural formations come from accidental fusions of sand, soda and lime, the main ingredients of glass. When these common materials are subjected to high temperatures, such as volcanic explosions or lightning, they fuse into glass.

Early Roman naturalist Pliny (23-79 A.D.) attributed the origin of glass manufacture to an accidental discovery. In about 5000 B.C., a group of Phoenician sailors moored their ship, with its cargo of soda, on a sandy beach. In preparing their meal, the sailors were unable to find any stones to support their cauldron. They substituted lumps of soda ash. The heat created by the cooking fire fused the sand and soda, producing transparent streams of liquid glass.

Regardless of the exact beginnings, in civilized Egypt of 1500 B.C., glassmaking had grown to be a thriving, stable industry. Although the Egyptians created small handmade objects of glass, it took Roman ingenuity to develop a method of "rolling out" glass into thin slabs. Records show they poured molten glass on flat stones, dusting it with sand and stretching it with pincers. This barely transparent product was first used in floor and wall mosaics, but it was not long before thin sheets of glass were used to cover small areas in buildings. Recent excavations in Pompeii (79 A.D.) have uncovered bits of glass together with lead



From an ancient Egyptian frieze, it is evident the Egyptians knew and valued glass. The blowpipe is still used in glassblowing today.

window frames. The rough, irregular semi-opaque glass hardly admitted light, but at least it was possible to partially illuminate building interiors with natural light. The idea of a window had been born.

From the fall of the Roman Empire in 476 A.D., well into the Middle Ages, windows were practically forgotten. The word window is derived from the old Norse word "vindauga", meaning "wind eye". Without glass, these openings revert back to their earlier purpose being that of a "wind hole" controlled only by shutters. Feudal castles of this time had nothing resembling glass windows, only "wind holes".

By the sixth and seventh centuries, however, windows began to appear in churches from Turkey to Paris. During this period, it was common practice to construct new buildings from the parts of old ones. The glass used for windows was borrowed from the ruins of earlier Roman buildings. Because larger panes of glass had broken, the windows in these sixth and seventh century churches were made of a multitude of tiny pieces of glass.

The science of glassmaking, which had barely survived in monasteries, began its first revival in Venice around 1000 A.D. Beginning in about the 12th century, spectacular stained glass windows were incorporated into Gothic churches throughout Europe.

As glassmaking became an industry, guilds were established. Glassmaking had been a closely guarded secret. Because of the expanding industry, it became increasingly difficult to contain trade secrets. The death penalty was imposed upon any guild member who divulged any of the glassmaking techniques. Despite the guild's desire for secrecy, the glass industry was growing. In the early 17th century, the glass industry took root in the United States.

By 1620 there were two glass manufacturing houses in the first permanent settlement of Jamestown, Virginia. Unfortunately, both glass houses failed after only a few years of operation, leaving America dependent on England for glass. Most of this early glass was extremely thin ( $\frac{1}{16}$ " thick) and had a very irregular surface. It was called "Newcastle" glass. Newcastle glass had a distinctive amber or violet tint resulting from metallic impurities. Even today, various metallic oxides are added to provide different colors



and quality. For instance, lead is used to give brilliance and clarity in crystal or flint glass.

In the Colonial period, glass was reserved for the rich. Glass was not considered part of a building, but rather a fixture owned by the tenant. When a tenant moved, so did the glass. The next occupant would have to provide his own glazing, or another material—oiled paper, wooden shutters, or animal skins. All colony-bound English immigrants were advised to bring window panes with them. Because of its cost and scarcity, glass was often bequeathed to surviving relatives in wills.

The glass shortage was compounded by a shortsighted and exorbitant glass tax, imposed in both England and France, which was not repealed until 1851. With a virtual monopoly on manufacture, England remained the main supplier of glass in the United States until the mid-nineteenth century. However, American resourcefulness was reflected in practical adaptations of glass, such as Benjamin Franklin's invention of bifocal glasses.

### Glassmaking Techniques

Seventeen hundred years after the Romans, the process for manufacturing glass remained the same. Glass was blown onto flat pieces of metal, and, while the glass was still hot, the pieces were spun. Centrifugal force, caused by spinning, made the glass flatten out into thin sheets. When the blowpipe was removed, it left a distinctive bubble in the center of the glass sheet; consequently, it was called "bull's eye" or "crown" glass. Glass size was limited, rarely exceeding 18" square.

Cylinder glass was an improvement over crown glass. The distinctive bubble had been removed by blowing the glass into a cylinder, splitting it open, then reheating it and flattening it out. Nonetheless, this slow process, which was all done by hand, pro-

duced marginal quality and limited size window panes.

During the 16th and 17th centuries, several innovations in glass manufacturing signalled the beginning of the modern age of glass. The English discovered that the quality and clarity of glass could be dramatically improved by burning coal instead of wood in their glass-fusing furnaces. Windows could then be used for view as well as for interior lighting.

At about the same time, the French learned to cast glass. This innovation produced clear, uniformly thick plate glass. After the sheets cooled, they were ground to a uniform thickness. The surfaces were then polished with increasingly fine compounds until all evidence of grinding was removed. The resulting product was known as polished plate glass. The French kept their innovation a secret; thus, they established a virtual monopoly for fine mirrors. The method of making polished plate glass, developed by Louis Lucas de Nehou in 1688, is basically the same today, only the grinding and polishing process is mechanized.

The real revolution in glassmaking occurred in the beginning of this century. In 1903, Michael Owens, with financial support from Edward Libby, perfected the first automatic glassblowing machine. This discovery completely altered the glass container business. The following year Irving Colburn devised the first machinery to draw flat glass automatically; it is known as the Colburn process. The same year Emile Fourcalt independently designed a similar machine. Both of these processes allowed the production of low-cost, high-quality flat glass.

The next major development in glass manufacture came in 1926 by the Pittsburgh Plate Glass Company. It was labeled the Pennvernon process and it enabled glass to be drawn vertically, holding the sheets absolutely flat from the liquid state to the finished product. The glass never touched rollers or any foreign objects until it had cooled beyond damage.



Inside a glass factory in the 1700's, plate glass was ground and polished by hand.

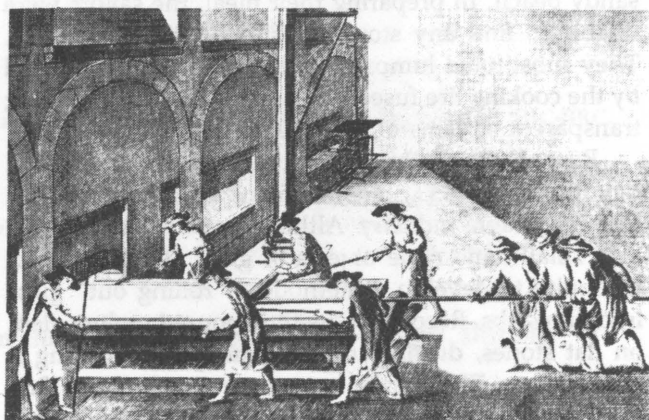


Plate glass entered the annealing oven in the late 1700's. Annealing reduced the brittleness of glass and fixed tints.



Polished plate glass loses a certain amount of the "fire finish" brilliance due to the grinding and polishing process. Float glass is a relatively recent development resulting from years of research attempting to combine a fire finish with the low distortion properties of plate glass. Pilkington Bros., Ltd., of England were the first to develop the float process.

The method used in making float glass is considerably different from that used for either sheet or plate glass. Molten glass is poured into a shallow pan of molten metal, mainly tin. Glass has a lower density than tin, so it 'floats' to the top, much the same as vinegar separates from oil in salad dressing. Because of surface tension of the two materials, the glass spreads over the molten metal and becomes perfectly flat, with both surfaces parallel to each other. Since the melting point of the tin alloy is lower than that of the glass, the glass will harden while floating on the surface of the metal, and it is drawn off the molten metal bed in a continuous process.

For most commercial glazing applications, float glass and plate glass are interchangeable. Since float glass has proven to be less expensive to make than plate, it will probably replace plate glass almost entirely in the near future.

### Composition

Glass is an unusual material with respect to its internal structure. Glass, being a rigid material, would logically be called a solid, except most solids have a crystalline structure, with their atoms arranged in a definite geometric pattern. Glass, on the other hand, has an internal structure resembling a liquid, with its atoms arranged in a random pattern. The rapid cooling process required to make glass suspends the atoms in their disordered arrangement. Therefore, glass has properties of both liquid and solid materials. Glass has sometimes been referred to as a super-cooled liquid.

The unique properties of glass can be shown by the fact that glass sags with time. If a piece of glass has been installed in a vertical window for many years, it will be thicker at the bottom than at the top. Although not noticeable to the naked eye, this extremely slow flow of glass shows that it is, indeed, a solid and liquid.

### Manufacture

The science of glassmaking has come a long way since the Romans first used glass to cover openings in their buildings. Today we have many glazing products available, each made with different ingredients and/or processes to satisfy various uses. Regardless of the techniques and treatments employed, flat glass falls into three types: sheet glass, float glass, and plate glass.

Sheet glass, the least expensive of the three types, is further subdivided into categories based on various thicknesses: picture glass, window glass, and heavy sheet glass. Picture glass, the thinnest of the three types, is not used in construction. Its primary function is for covering drawings and displays. Window glass, used extensively for residential and commercial glazing, comes in two thicknesses: single strength (SS) which is  $\frac{3}{32}$ " thick, and double strength (DS), which is  $\frac{1}{8}$ " thick. Heavy sheet glass is the thickest, ( $\frac{3}{16}$ " to  $\frac{7}{32}$ " ) and is not used where high optical clarity is necessary.

Although float and plate glasses are manufactured by completely different processes, they are considered interchangeable for most uses. Both provide superior optical quality and strength beyond that offered by sheet glass. They are available in  $\frac{1}{8}$ " to  $\frac{1}{4}$ " thickness, and heavy float and plate glasses in  $\frac{5}{16}$ " to  $\frac{7}{8}$ " thicknesses. Both glasses are commonly used for display windows, high quality mirrors, and (after heat treatment) automobile glazing. All thicknesses are further subdivided according to their quality: silvering (for optical instruments), mirroring (high quality mirrors), and glazing (general glazing uses).

### Products

There are a variety of treatments which can be used during and/or after the glass-making process in order to achieve particular effects. The products available include: patterned glass, wired glass, tinted glass, reflective-coated glass, heat-treated glass, composite glass, and various surface treatments. Glass is not limited to a single treatment; for instance, wired glass might also have a heat treatment or surface treatment.

**Patterned glass** is made by rolling a patterned roller over semi-cooled glass. One or both sides may be embossed with a wide range of textures and patterns. The pattern selected dictates the degree of light transmission and obscurity. After patterning, the glass may receive additional treatments, such as tempering for safety or sandblasting for increased obscurity. Tub and shower enclosures are probably the most common use of patterned glass.

**Wired glass** is made by rolling a layer of meshed wire into the glass when it is still in the liquid state. Its purpose is to reduce injuries from flying glass, since the wire holds the glass fragments together under low levels of impact. Similarly, the wire holds the glass together when the glass cracks due to excessive heat. In a fire-rated door with a glass light, heat will usually break the glass before the door ignites. Wired glass is used extensively in entrance and corridor doors, skylights, and other possible dangerous situations.

With an increased concern for energy and glare reduction, several products which were developed

during the 1950's have seen increased usage; they are reflective-coated glass and tinted glass. Clear glass transmits about 90% of the visible daylight into a building, the rest of the light is reflected or absorbed into the glass. Certain types of tinted glass can reduce the visible light transmission down to 30%. Certain reflective-coated glass can reduce visible light transmission to as low as 5%.

**Tinted glass** is produced by adding various ingredients to the molten glass to reduce light transmission. By reducing the light transmission, it reduces the heat transmission. It comes in a wide range of colors; green, gray, and bronze are the most commonly used. The purpose of tinted glass, as with reflective-coated glass, is to increase indoor comfort by reducing glare and heat transmission. It is used primarily on commercial and institutional buildings and is often selected for its architectural effect.

**Reflective-coated glass** looks much like tinted glass, but is manufactured by a very different process. A metal or metal oxide coating is bonded to one surface of the cooled glass, whereas tinted glass is made by mixing ingredients into the molten glass. Under certain lighting conditions, reflective-coated glass becomes a one-way mirror, so vision can only occur from the dark side to the lighter side. For instance, during the day a person inside the building can look out, but someone on the outside sees a mirrored effect. This condition is reversed at night. It can be combined with sheets of plain glass to create insulated units, and it is used for applications similar to that of tinted glass. However, reflective glass is usually preferred when it is important to reduce excessive heat build-up from direct sunlight.

Despite its ability to take on color and texture, glass has had one major drawback—it breaks, or shatters, into large dangerous pieces. Long ago, a Roman craftsman supposedly invented a malleable glass that would not break if it were dropped. The inventor brought this remarkable new product to the attention of Tiberius (Caesar of the Roman Empire, 23 to 37 A.D.). For some reason, Tiberius had the inventor killed on the spot. It will never be known exactly what the marvelous material was, but nearly 2000 years later, during the early 1950's, a similar product was developed. It was heat-treated glass.

There are two types of heat-treated glass: fully tempered and heat-strengthened. Neither type can be cut, notched, or drilled after it has been heat-treated. The heat-treating process tends to curve a piece of glass slightly, particularly near the edge.

**Fully-tempered glass** is often called safety glass because it is three to five times stronger than other glass of the same thickness and size and, when broken,

it shatters into many relatively harmless cube-like pieces. It is often specified for areas in which human contact is inevitable, such as storm and entry doors, sidelights, and tub and shower enclosures.

**Heat-strengthened glass** is made by the same technique as fully-tempered glass except the process is stopped before the glass has become fully tempered. Even though heat-strengthened glass is about twice as strong as ordinary glass, it is not considered safety glass because when it breaks, it does so in much larger pieces than fully-tempered glass. The most common use of this material is for sensitive areas in curtain-wall construction.

**Composite glass** is a single unit made of two or more layers of glass. The basic products within this category are laminated glass and insulated glass.

**Laminated glass** was invented by Benedictus of France around 1900 and is manufactured by sandwiching polyvinyl butyrate plastic between two or more layers of glass. The different layers are bonded together to form a single unit. With the exception of irregular-surfaced glass (such as patterned glass), any type of glass may be combined into a laminated unit. Automotive glazing, doors, and interior partitions are common applications of laminated glass. By varying the thickness and number of layers, several other products result. For instance, burglar-resistant glass, which is often used for display windows, is made of two layers of  $\frac{1}{8}$ " thick glass with a .090" plastic inter-layer. Laminated glass using a minimum of four layers and from  $\frac{3}{4}$ " to 3" thick is considered bullet-resistant glass. Glass up to 7" thick can be special ordered. Because varying the thickness of the layers has proved to be very effective in reducing sound transmission, the resulting product is called acoustical glass. It is used extensively in radio and TV studios.

**Insulated glass** is the second type of composite glass. It consists of two or more pieces of glass separated by one or more sealed air spaces. The air space is generally  $\frac{3}{16}$ " to  $\frac{1}{2}$ " thick and is filled with dehydrated air kept at atmospheric pressure. Its purpose is to reduce condensation and heat loss (or gain).

Insulated glass is made in two ways: metal-edged or glass-edged. Metal-edged units, conceived in the 1930's by Haven, an engineer, are formed by connecting two pieces of glass together with a metal edge. A desiccant (moisture absorber) located in the metal edge arrangement dehydrates the sealed-in air. Glass-edged units were developed during the 1950's and are formed by fusing two pieces of glass to create a single unit. The space within the glass-edged units may be filled with either an inert gas or dehydrated air. Both types are widely used in commercial and residential buildings.

## MEASUREMENT OF WINDOW UNITS

Four different measurements are associated with any one window. They are: unit size, rough opening size, sash size, and glass size. When working with windows, it is important to specify which of the above four measurements is being given. Window sizes are usually given width first and then height.

The unit dimension represents the overall outside dimensions of a manufactured window. The size can be taken from different places depending on the type of window. For instance, a wooden double-hung window normally has pre-attached brick mold trim. In this case, the unit size will be the out-to-out size of the brick mold. On the other hand, a clad casement window often comes with a plastic nailing flange. For this type, the unit size will be identical to the out-to-out dimension of the jambs. Therefore, the unit size of a window with attached brick mold will be larger than the rough opening size. In the other case, the unit size will be smaller than the rough opening size.

The rough opening size is the dimension required in the rough frame wall in order to receive the window. This size is the most meaningful to the builder since it dictates the framing size for the exterior wall opening. (The dimension is usually  $\frac{1}{4}$ " larger per side than the size from the outside of the jamb to jamb measurement. The extra space is needed for leveling and plumbing the window in the rough framing of the wall.

The sash size is the overall measurement of the window sash. The window sash fits between the two jambs; consequently it is the same as the distance

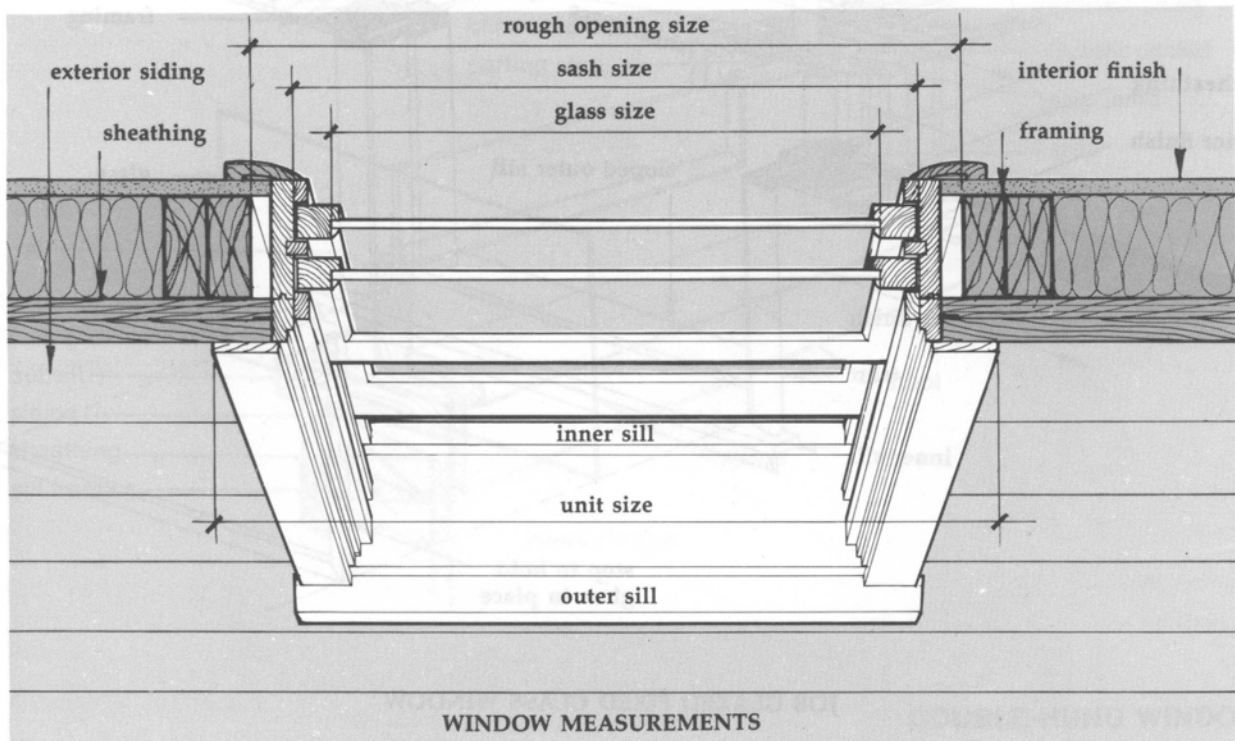
between the jambs for the width size. The height dimension will vary, depending on the type of window. For instance, a casement window's sash extends from the head to the sill, whereas a double-hung window has two or more sash between the head and sill.

The glass size is the measurement of the glass area as viewed in the sash. It is the sash size minus the stile size (for the width) or minus the rails (for the height).

The following example illustrates the sizes and their relationship to each other for a 24" by 24" double-hung window unit.

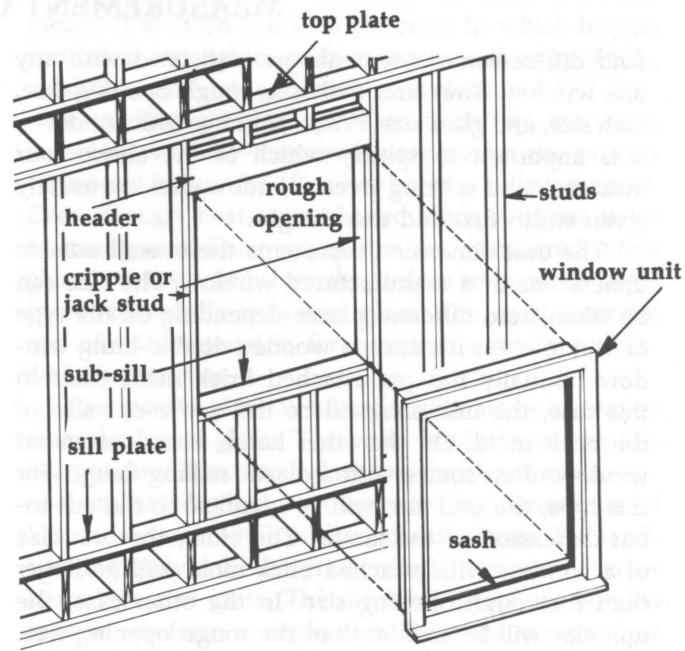
### OPENING SIZES

	inches
Glass Width (glass size)	24
Sash stiles (2" each)	4
Side jambs ( $\frac{3}{4}$ " each)	28
Plumbing or fitting allowance ( $\frac{1}{4}$ " per side)	1 $\frac{1}{2}$
	<u><math>\frac{1}{2}</math></u>
Rough opening width	30
Glass height (glass size)	48
Window rails	6
Head jamb	$\frac{3}{4}$
Window sill	2
Plumbing or fitting allowance ( $\frac{1}{4}$ " top & bottom)	<u><math>\frac{1}{2}</math></u>
Rough opening height	57 $\frac{1}{4}$



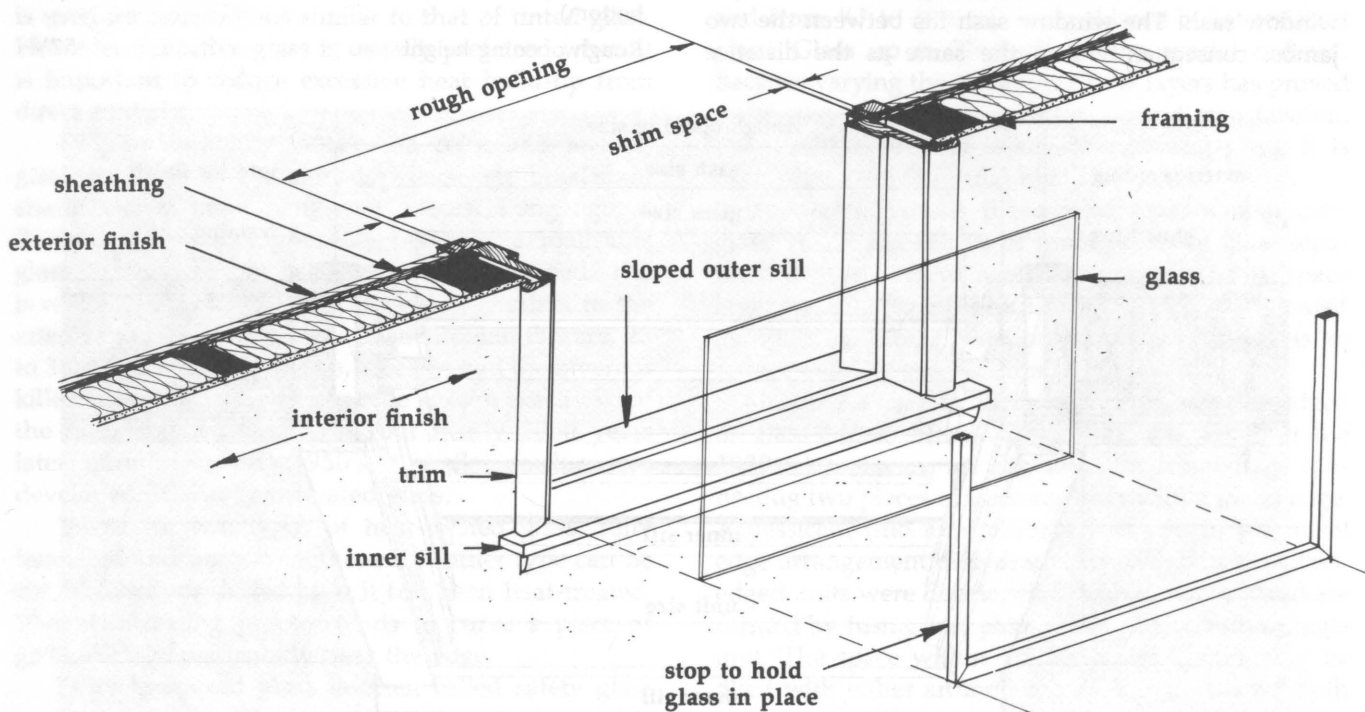


Today, most operable windows arrive at a job site as a complete, factory assembled unit. When the rough framing and exterior sheathing are complete, the window units are installed from the outside. The unit is fastened through the face (either through the brick mold trim or through a nailing flange) into the framing. The rough frame opening is normally  $\frac{1}{2}$ " larger on the top and sides to allow plumbing and levelling of the window unit. (Often, in older buildings, the window units are fastened through the jambs rather than through the face.) Shim shingles are used between the window frame and the rough opening to ensure the jambs remain straight, level, and plumb.



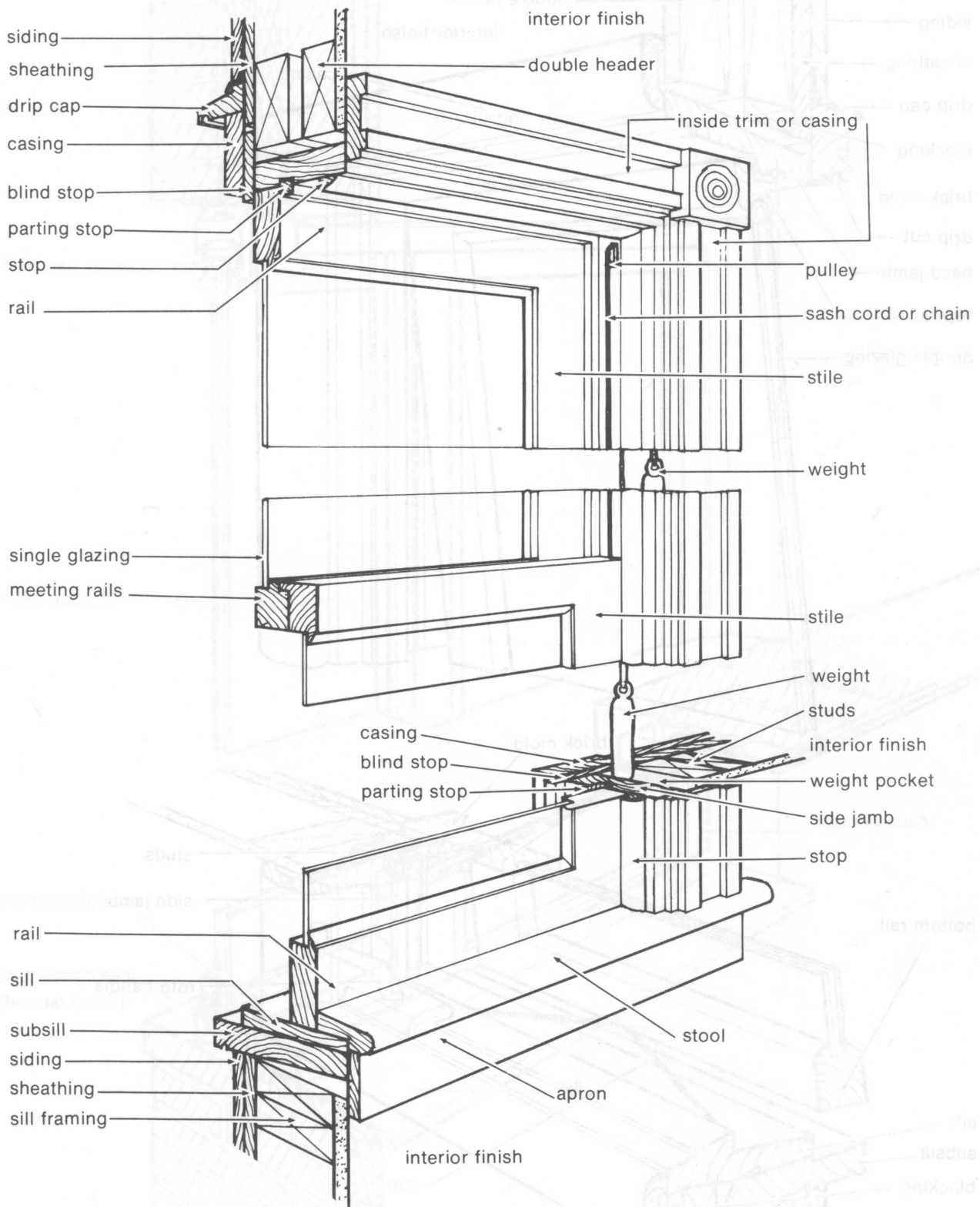
**WINDOW INSTALLATION**

The method of attaching fixed or non-operable windows depends on how the window is made. When the sash is fixed in a frame and delivered as a single unit, the window is fastened through the face, just as it is with any operable window unit. However, when there is no sash, merely a frame and glass, the carpenter plumbs and shims the jamb and nails through it into the rough framing. Then the glass is set into the frame from the inside of the building. The glass is held in place with stops.

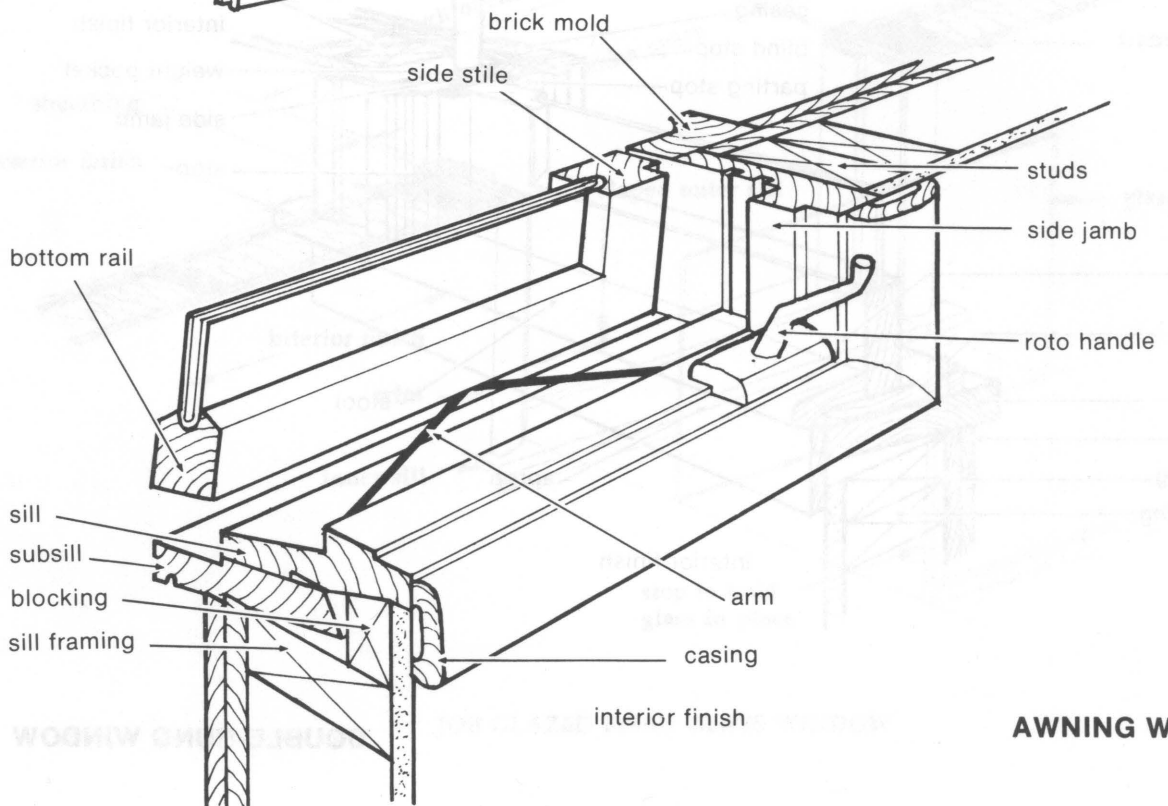
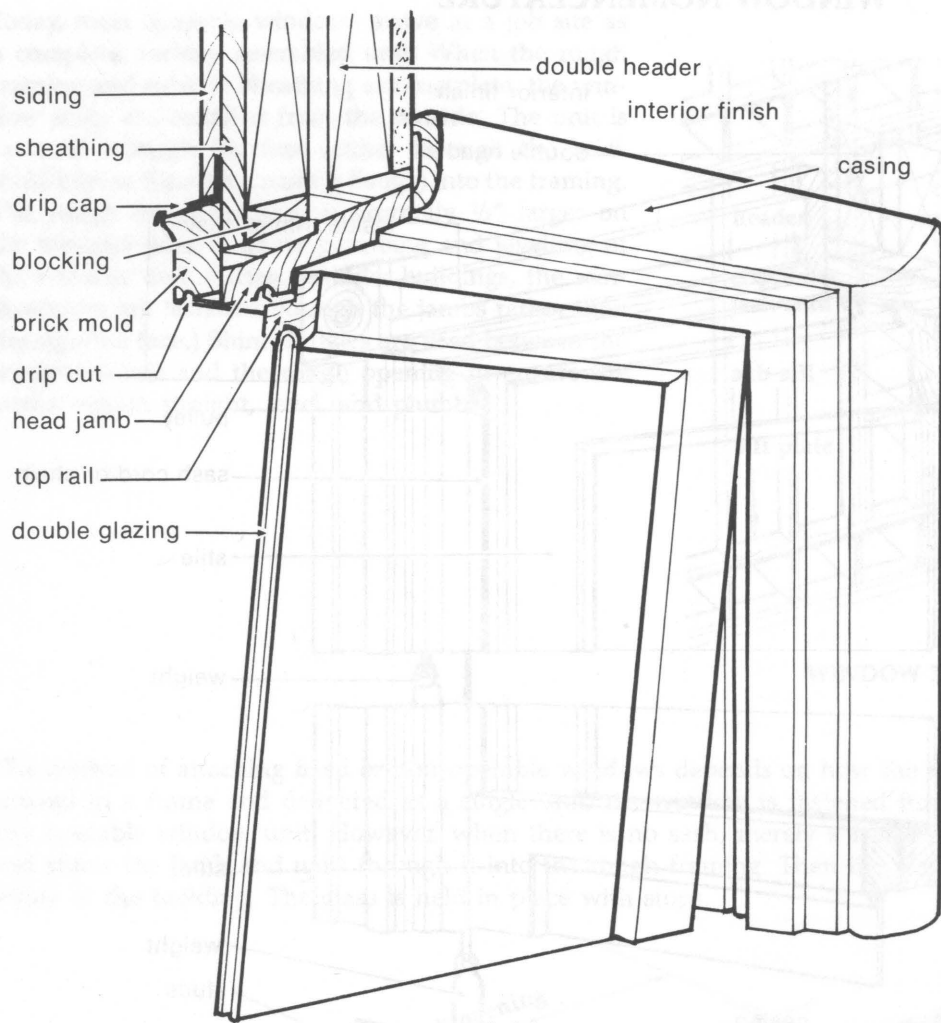


**JOB GLAZED FIXED GLASS WINDOW**

# WINDOW NOMENCLATURE

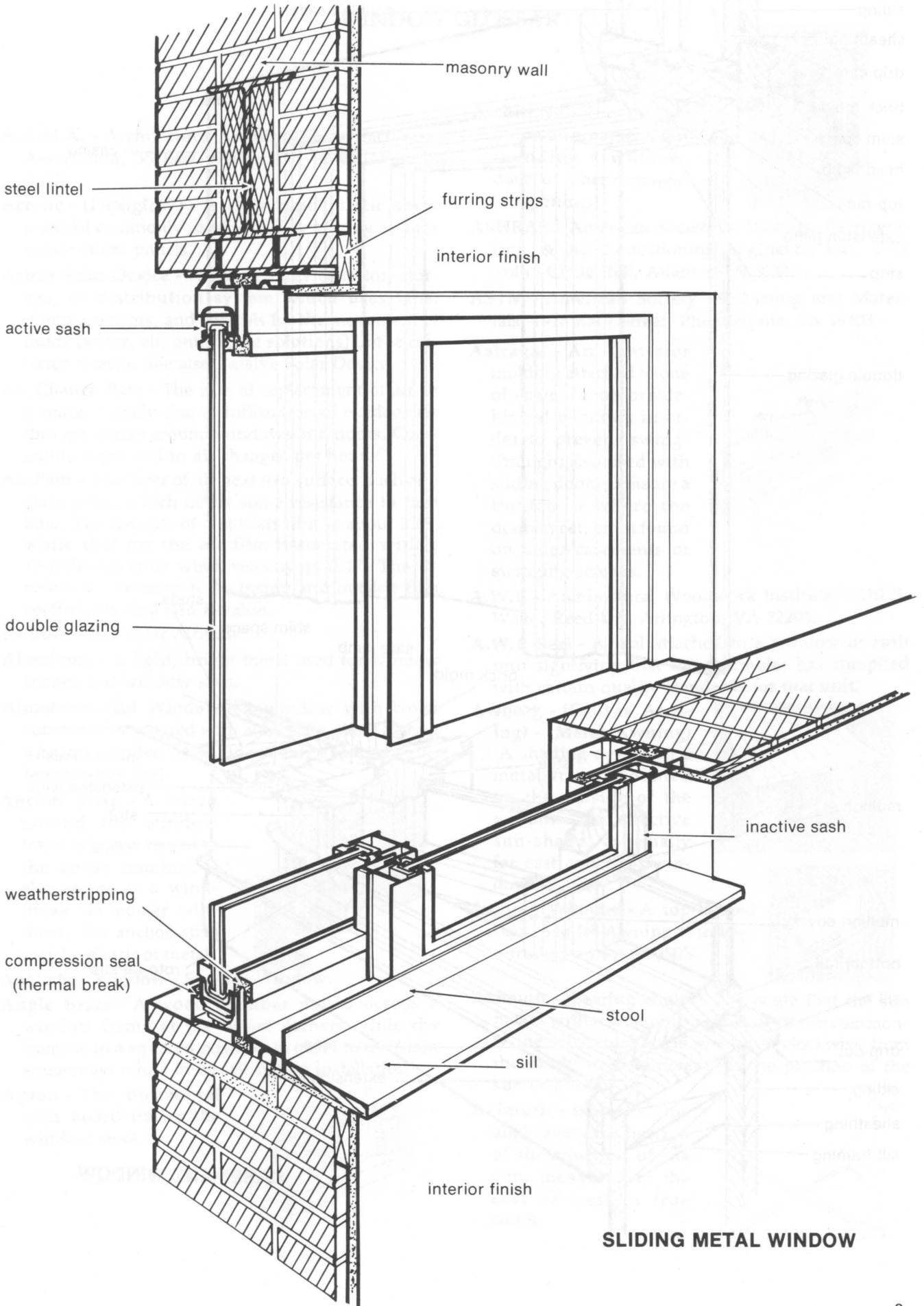


**DOUBLE-HUNG WINDOW**

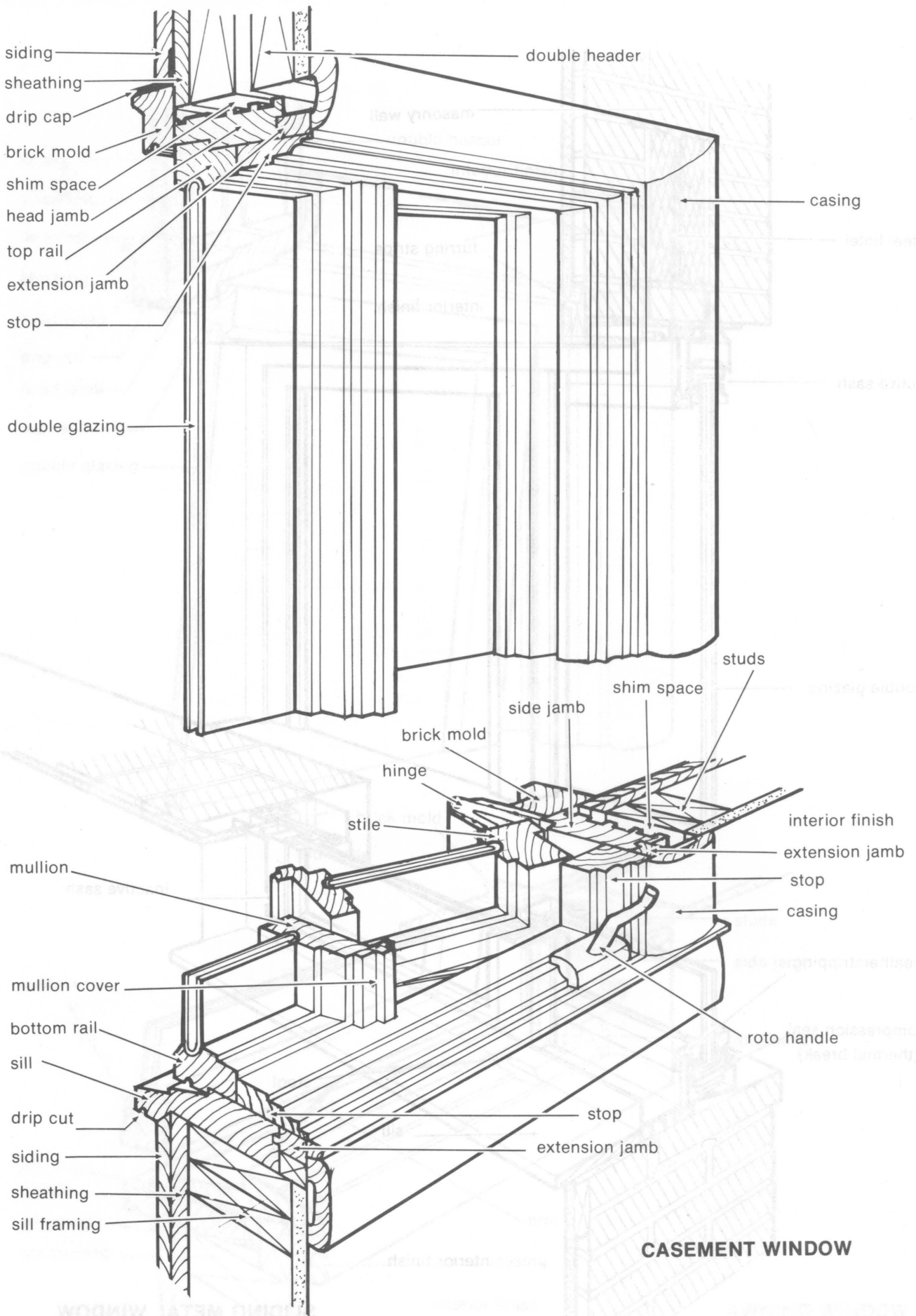


**AWNING WINDOW**





**SLIDING METAL WINDOW**



**CASEMENT WINDOW**

## WINDOW GLOSSARY

### A

**A.A.M.A.** - Architectural Aluminum Manufacturers' Association, 35 East Wacker Drive, Chicago, IL 60601

**Acrylic - (Plexiglas®)** - A clear rigid plastic sheet material commonly used for safety glazing and for inside storm panels.

**Active Solar Device** - A solar energy collector, storage, or distribution system which uses fans, pumps, sensors, and controls for the movement of fluids (water, air, anti-freeze solutions) in the collector system. See also Passive Solar Device.

**Air Change Rate** - The rate of replacement of air in a space, usually due to infiltration of outdoor air through cracks around windows and doors. Commonly expressed in air changes per hour.

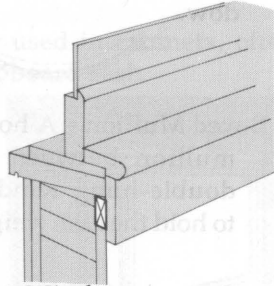
**Air Film** - The layer of air next to a surface, such as a glass pane, which offers some resistance to heat flow. The R-value of a still-air film is about 0.68, while that for the air film associated with a 15-mile-per-hour wind velocity is 0.17. The R-values are referred to as inside and outside film coefficients. See also R-value.

**Altitude** - See Solar Altitude.

**Aluminum** - A light, bright metal used for window frames and window sash.

**Aluminum-clad Window** - A window with wood construction covered with aluminum sheet having a factory-applied finish (to provide a longer maintenance-free life).

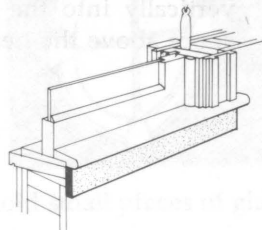
**Anchor Strip** - A board around the window frame which is nailed to the house framing; it also serves as a wind-break. In newer windows, the anchor strip may be plastic or metal.



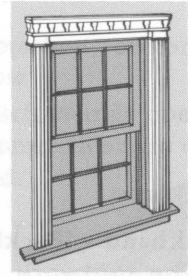
**Angle Bay Window** - See Bay Window.

**Angle Brace** - A wood member nailed across a window frame at the upper corners while the frame is in a squared position in order to maintain squareness while in transit before installation.

**Apron** - The horizontal trim board under the window stool.



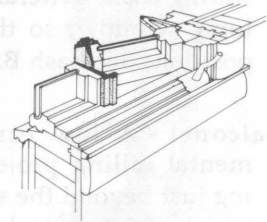
**Architrave** - The molded frame or ornament surrounding a window, door, or other rectangular opening.



**ASHRAE** - American Society of Heating, Refrigerating, & Air Conditioning Engineers, Inc., 1791 Tullie Circle, NE, Atlanta, GA 30329.

**ASTM** - American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

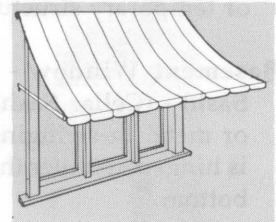
**Astragal** - An interior molding attached to one of a pair of doors or side-hinged windows in order to prevent swing-through; also used with sliding doors to insure a tighter fit where the doors meet; often found on older casements or swinging screens.



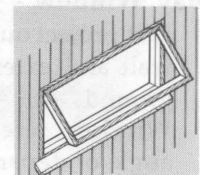
**A.W.I.** - Architectural Woodwork Institute, 2310 S. Walter Reed Dr., Arlington, VA 22206.

**A.W.I. Seal** - A seal attached to a window or sash unit signifying that the assembler has complied with certain quality standards for that unit.

**Awning - (Canvas Awning) - (Metal Awning)** A shading device on a metal frame mounted on the outside of the window. An effective sun-shade, especially for east and west windows.

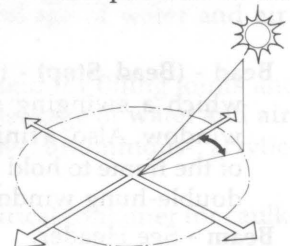


**Awning Window** - A top-hinged sash. See Jal-Awning Window. Introduced in the 1950's.



**Azimuth - (bearing angle)** - The angle that the sun makes with reference to a given position; commonly the horizontal angle measured clockwise from the north; used to determine the position of the sun or a wall.

**Azimuth - (solar)** - The angle along the horizon of the position of the sun, measured to the east or west of true south.

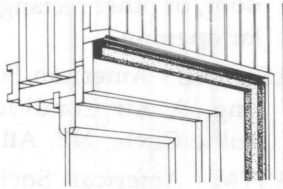




## B

### Backband - (Backbend) -

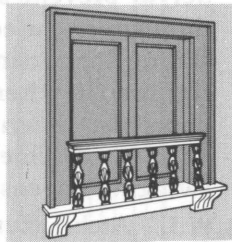
The millwork around the outside edge of the window casing, usually used when the casing consists of flat boards.



**Balance** - See Sash Balance.

**Balance Spring** - A device for counterbalancing a sliding sash, generally associated with a double-hung window, so that it can be held open at a position. See Sash Balance.

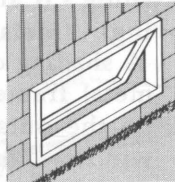
**Balconet** - A low ornamental railing projecting just beyond the sill, which is made to look like a balcony.



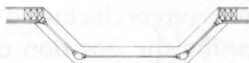
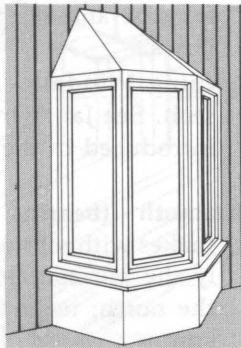
**Bar** - See Muntin.

**Barn Sash** - A plain sash for farm or cottage, used as a fixed, sliding, or casement window; generally installed in a rough, job-built type of frame for utility or temporary structures.

**Basement Window - (Basement Sash) - (Cellar Sash)** - A wood or metal in-swinging sash that is hinged at either the top or the bottom.



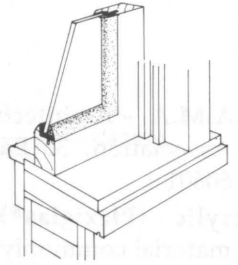
**Bay Window** - Windows that project out from the wall and extend to the ground. An Angle Bay Window refers to the angle of departure from the plane of the wall. See also Bow Window.



**Bead - (Bead Stop) - (Stop)** - A wood strip against which a swinging sash closes, as in a casement window. Also, a finishing trim at the sides and top of the frame to hold the sash, as in a fixed sash or a double-hung window (also see Stop).

**Beam** - See Header.

**Bedding** - A method of glazing in which a thin layer of putty, or glazing compound, is placed in the glass rabbet, the glass pressed into the bed, the glazier's points driven, and the sash is face-puttied; excess putty on the reverse side is removed.



**Bevel** - A cut made at an angle other than a right angle.

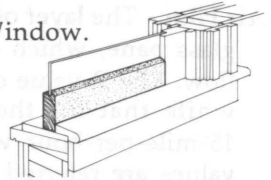
**Bill of Material** - A list of pieces required for millwork items, including number, size, species and grade of wood, or type of metal sash and necessary hardware.

**Blank Window** - See False Window.

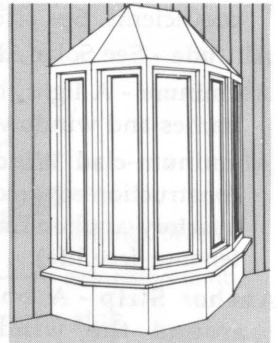
**Blind** - (See Shutter) - Also a roller shade on the inside of the window.

**Blind Window** - See False Window.

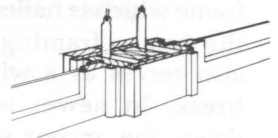
**Bottom Rail** - The bottom horizontal member of a window sash.



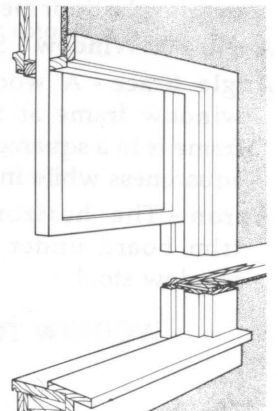
**Bow Window - (Compass Window) - (Radial Bay Window)** - A rounded bay window that projects from the wall in the shape of an arc; commonly consisting of five sash. See also Bay Window.



**Boxed Mullion** - A hollow mullion between two double-hung windows to hold the sash weights.



**Box-Head Window** - A window made so that the sash can slide vertically into the wall space above the head.



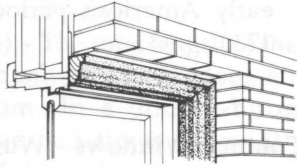
**Boxing** - An enclosure at the side of the window frame for holding a boxing shutter when folded.

**Boxing Shutter** - A folding shutter that, when folded, fits into an enclosure at the side of the window.

**Box Window Frame** - See Weight Box.

**Brace** - See Angle Brace.

**Brick Molding** - A standard milled wood trim piece to cover the gap between the window frame and masonry.



**Brise-Soleil** - An architectural device on a building (such as a projection, louvers, or a screen) to block off unwanted sunlight.

**B.T.U. - (Btu)** - An abbreviation for British Thermal Unit, commonly shown as 'Btu'; the heat required to increase the temperature of one pound of water one degree Fahrenheit, about the heat from burning one wooden match.

**Btuh.** - An abbreviation for Btu per hour; a rate of heat flow.

**Bull's Eye Glass** - A sheet of glass with a raised center formed by the blow pipe; because of its imperfections, it was used in barns and secondary windows. See Crown Glass.

**Bull's Eye Window - (Oculus, Rose, Wheel, Oeil-de-Boeuf)** - See Cameo Window.

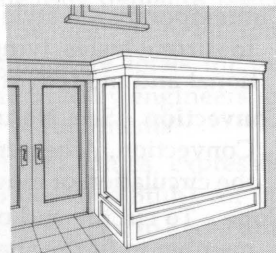
**Bundling** - Tying the same or different parts of a window frame for shipping.

**Butyl Tape** - See Sealant.

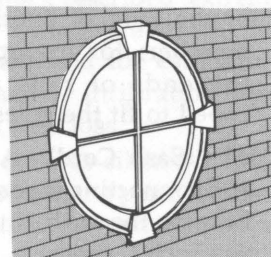
## C

**Cabinet Sash** - A sash door used in cabinets, often with glass; also called cupboard sash.

**Cabinet Window** - A projecting window for the display of goods, as in a shop.



**Cameo Window** - A fixed oval window, generally with surrounding moldings and ornaments, often found on Colonial Revival Houses.

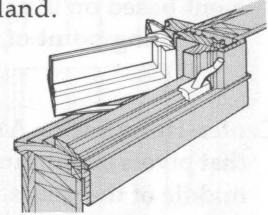


**Comes** - Lead strips which hold small pieces of glass in leaded windows.

**Cap** - A decorative molded projection, or cornice, covering the lintel of a window.

**Casement** - A window sash which swings open on side hinges; inswinging are French in origin while outswinging are from England.

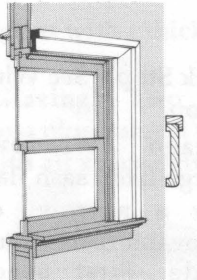
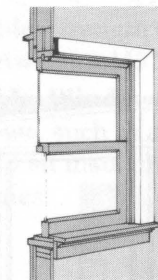
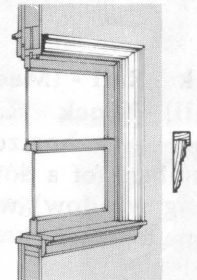
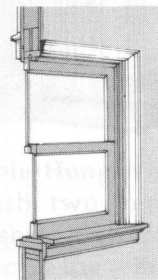
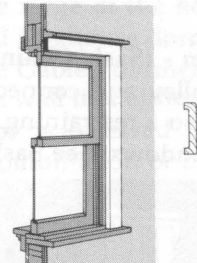
**Casement Adjuster** - A device for holding a casement in any open position.



**Casement Stay** - Bar for holding a casement in any of several fixed open positions.

**Casement Window** - A window with one or more casements.

**Casing - (Trim)** - Exposed molding or framing around a window or door, on either the inside or outside, to cover the space between the window frame or jamb and the wall.



**Catch** - See Latch.

**Catherine Wheel - (Window Wheel)** - See Wheel Window.

**Caulk** - To seal cracks and joints around window and door frames to prevent leakage of water and air. Also spelled Calk.

**Caulking** - A mastic compound for filling joints and sealing cracks to prevent leakage of water and air; commonly made of silicone-, bituminous-, acrylic- or rubber-based material.

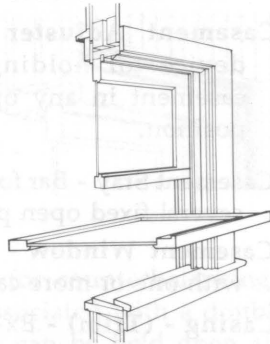
**Caulking Cartridge** - Cylindrical container for caulking compound.

**Caulking Gun** - Device for extruding caulking compound from a cartridge by trigger action.

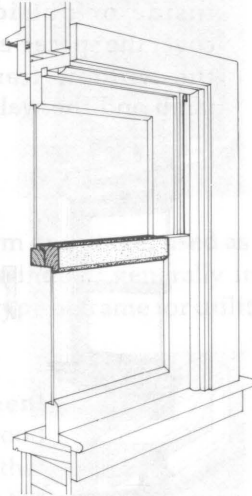
**Cellar Sash** - See Basement Window.

**Celsius** - A centigrade scale of temperature measurement based on 0° as the freezing point and 100° as the boiling point of water. Abbreviated °C.

**Center-Hung Sash** - A sash that pivots on pins in the middle of the sash stiles and sides of the window frame to allow access for cleaning from the inside.



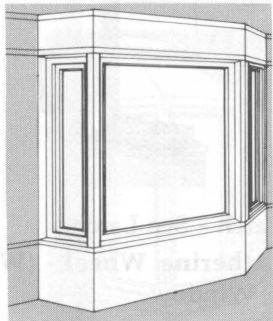
**Chain - (Sash Chain)** - Metal links running over a pulley and connecting the sash to a sashweight. Also a restraining link in old casement or hopper windows. See Sash Balance.



**Check Rail - (Meeting Rail) - (Lock Rail)** - The horizontal members (of a double-hung window) which come together.

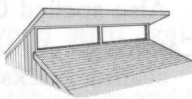
**Check Stop** - See Window Stop.

**Chicago Window** - A large fixed sash flanked by a narrow, often movable, sash on either side. First used by Chicago School architects in late 19th and early 20th century.



**Circle Top Transom** - See Fanlight.

**Clerestory - (also Clearstory - High-Light Window)** - A window in the upper part of a lofty room that admits light to the center of the room.



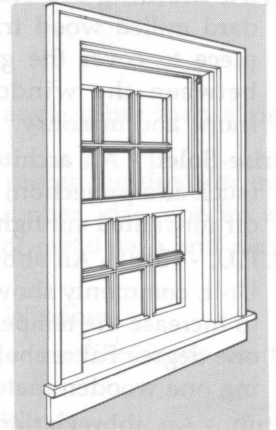
**Closure Strip** - A member to fill or close a space; an in-fill piece.

**Coated Glass** - A window glass with an outside surface provided with a mirror reflective surface; the shading coefficient ranges from 20% to 45%. See Shading Coefficient.

**Coiled Tape** - See Sash Balance.

**Colonial** - An architectural style associated with an early American period; Early American Style c. 1730.

**Colonial Windows** - Windows with small rectangular panes, or divided lites, designated as 12-lite, 16-lite, etc.



**Combination Window Unit - (Combination Storm Sash and Screen)** - A window assembly containing a half screen and two glass storm panels; in summer the bottom storm panel is stored in the top frame, exposing the screen panel.

**Commercial Standard** - A voluntary set of rules and regulations covering quality of product (or installation), methods of testing, rating of the product, certification, and labeling of manufactured products.

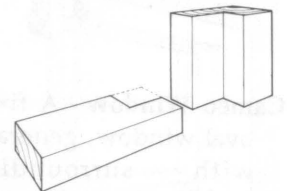
**Compass Window** - See Bow Window.

**Condensation** - The deposit of water vapor from the air on any cold surface whose temperature is below the dew point, such as a window glass or frame that is exposed to cold outdoor air. See Dew Point Temperature.

**Contemporary** - A style of architecture that is suitable to current tastes, lying between the so-called traditional and modern styles, and including both.

**Convection** - See Natural Convection and Forced Convection. A heat transfer process resulting from the circulation or movement of a fluid, such as air.

**Cope** - To cut the end of a member to fit the shape or molding of another member; for example, the ends of rails are coped to fit the stiles.



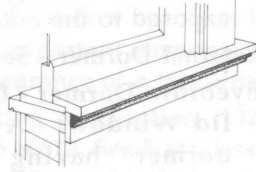
**Cord - (Sash Cord)** - A rope running over a pulley and connecting the sash to a sashweight to counterbalance the sash, in old double-hung windows. See Sash Balance.

**Corner Window** - Two windows meeting at a corner of a building.



**Coupled Window** - Two separate windows separated by a mullion. Also called a double window.

**Cove Molding** - Trim molding with a concave face.



**Crack Perimeter - (Crackage)** - The total length of the crack around a sash through which outdoor air could leak into the room. In a double-hung window the total crackage is 3 times the width plus 2 times the height of the sash.

**Crown Glass** - Large panes that first became available in the 17th Century and were incorporated in wooden sash windows. The glass was hand-blown through a pipe (pontil) into a circular disc, leaving a bubble or bullion where the pipe was inserted. Also known as bottle glass or bull's eye glass.

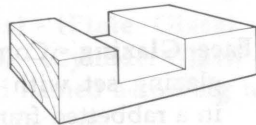
**Crystal Glass** - a clear glass with a high index of refraction; a glass containing lead; seldom used in windows because of cost.

**Cupboard Sash** - See Cabinet Sash.

**Cylinder Glass** - A glass blown in the shape of a cylinder and flattened into a sheet.

## D

**Dado** - A rectangular slot or groove (with 3 surfaces) cut across the grain of a wood member, into which another board is fitted. See also Plough.



**Daylight Glass** - Cobalt or bluish colored glass which absorbs the red part of radiation.

**Degree-Day** - A measure of heating demand, based on the difference between the mean daily outdoor temperature and 65°F. Cumulative totals for the month or heating season are used by engineers for estimating heating energy requirements.

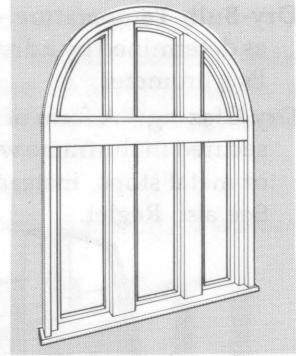
**Design Heat Loss** - The calculated values, expressed in units of Btu per hour (abbreviated Btuh), for the heat transmitted from a warm interior to a cold outdoor condition, under some prescribed extreme weather conditions. The values are useful for selecting heating equipment and for estimating seasonal energy requirements. Infiltration heat loss is a part of the design heat loss.

**Dessicant** - A drying agent, such as silica gel, used by some manufacturers between the panes of insulated glass to prevent fogging between the panes.

**Dewpoint Temperature** - The temperature of the air at which the water vapor in the air starts to condense in the form of a liquid or as frost.

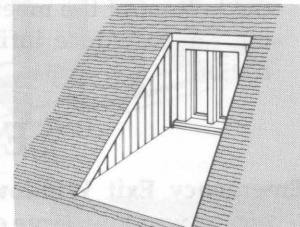
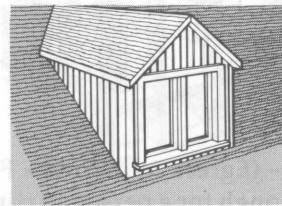
**Diffusing Glass** - Glass with an irregular surface for scattering light; used for privacy or to reduce glare.

**Diocletian Window** - A semi-circular window divided by wide mullions, into three lights. This ancient Roman style was later used by Palladio in the 16th Century. Also called a Therm. Used in Classical Revival buildings of the early 1900's.

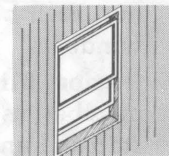


**Dormer** - A roofed structure housing a vertical window in a sloping roof. Shed dormers have a roof sloping downwards from the ridge of the house; flat-roof projections are called Doghouse dormers; those with a pointed roof are Gabled dormers.

**Dormer Window** - Window in a wall that either projects from a sloping roof, or is recessed (Inset Dormer) into the roof, or a combination of both.

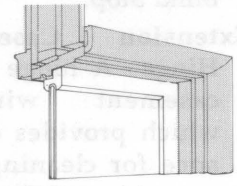
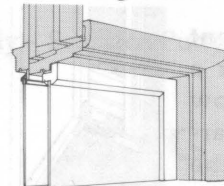


**Double-Hung Window** - Window with two vertically moving sashes, each closing a different part of the window.



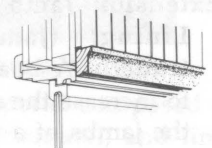
**Double-Strength Glass** - Sheet glass with a thickness between 0.115" to 0.133" (3 to 3.38mm).

**Double Windows - (Double Glazing)** - Two windows, such as a regular window plus a storm sash; also an insulating window with air space between panes.



**Double Window** - Two windows separated by a mullion, forming a unit. Also called a coupled window.

**Drip Cap** - A horizontal molding to divert water from the top casing so that the water drips beyond the outside of the frame.

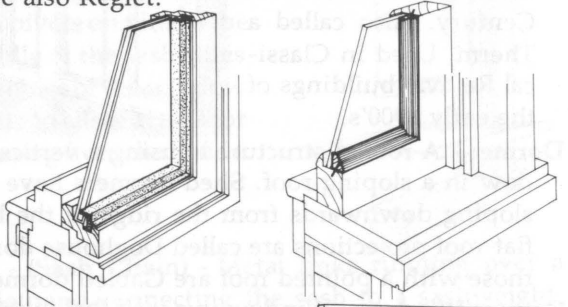


**Drip Cut** - See Weep Cut.

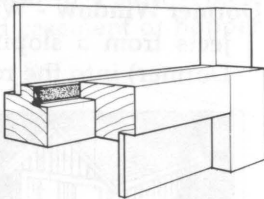
**Drop Window** - A vertical window in which the sash can descend into a cavity in the wall below the sill.

**Dry-Bulb Temperature** - The temperature of the air as determined by a dry thermometer bulb. See Sling Psychrometer.

**Dry Glazing** - A form of glazing in which the glass is secured in the frame with a dry gasket, wood stops, or metal stops, instead of by a glazing compound. See also Reglet.



**Dust Pad** - A strip of weatherstrip applied to the bottom of the meeting rail to reduce infiltration.

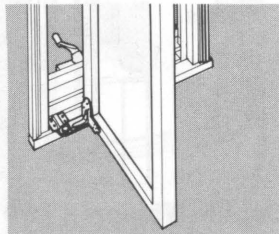


## E

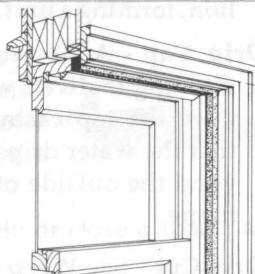
**Emergency Exit Window - (Egress Window)** - Fire escape window; large enough for a person to climb out; each bedroom should be provided with exit windows.

**Extension Blind Stop** - A molded window frame member, usually of the same thickness as the blind stop and united with it, thus increasing the width of the blind stop, in order to close the gap between the window frame and the rough opening in the house frame; used to attach the window frame to the wood framing; also known as Blind Stop Extender or Blind Casing. See also Reversible Extension Blind Stop.

**Extension Casement Hinge** - A hinge for a casement window which provides clearance for cleaning the two sides of the sash from the inside.



**Extension Jamb - (Jamb Lining) - (Jamb Extender)** - A board used to increase the depth of the jambs of a window frame to fit a wall of any given thickness.

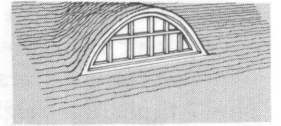


**Exterior Casing** - See Casing.

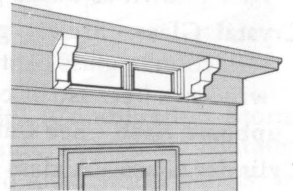
**Exterior Parts** - All parts of a window unit which are exposed to the outdoors.

**External Dormer** - See Dormer Window.

**Eyebrow Dormer - (Eyelid Window)** - A low dormer having no sides, the roofing smoothly curving upward over the dormer window. Commonly used on Shingle-Style and Romanesque-style buildings.

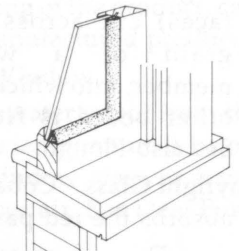


**Eyebrow Windows** - Low, inward-opening windows with a bottom-hinged sash. These attic windows built into the top molding of the house are sometimes called 'lie-on-your-stomach' windows or slave windows. Often found on Greek Revival and Italianate houses.



## F

**Face Glazing** - Common glazing set with putty in a rabbetted frame.

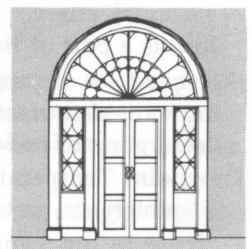


**Face Putty - (Front Putty)** - Putty (glazing compound) applied on the exposed side of the glass. See Face Glazing.

**Fahrenheit** - A temperature scale based on 32° as the freezing point and 212° as the boiling point of water at sea level. Abbreviated °F.

**False Window - (Blind Window) - (Blank Window)** - A window facsimile. A recess in an exterior wall with moldings to give the appearance of a window; for symmetry or decoration, but not utility.

**Fanlight - (Sunburst Light) - (Fan Window) - (Circle-Top Transom)** - A half-circle window over a door or window, with radiating bars. See Lunette.



**Fasteners** - Devices for joining two parts together, such as screws, nails, and bolts.

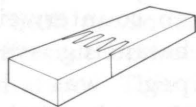
**Fenestration** - The placement of window openings in a building wall; one of the important elements in controlling the exterior appearance of a building.

**F.G.M.A.** - Flat Glass Marketing Association, 1325 Topeka Avenue, Topeka, KS 66612. See Flat Glass.

**Fillet** - A small narrow band of wood between two flutes or parallel grooves in a wood member; or flat surface of a trim piece.

**Film Coefficient** - See Air Film.

**Finger Joint** - A wood end-joint formed by a set of interlocking fingers, coated with adhesive and meshed together under pressure.



**Finish Casing - (Finish Trim)** - Interior trim boards around a window unit.

**Fire-Escape Window - (Emergency Exit Window)** - Window which opens onto fire escape; window designed for emergency exit.

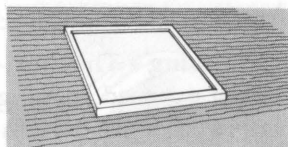
**Fire Window** - Window with fire-endurance rating specified for the location.

**Fixed Light - (Fixed Sash)** - Window which is non-operative (does not open).

**Flashing** - Sheet metal provided for drainage of water and to prevent water penetration into building.

**Flat Glass - (Window Glass) - (Plate Glass) - (Float Glass) - (Rolled Glass) - (Cylinder Glass)** - Glass sold in flat sheets and named according to the method used in its manufacture.

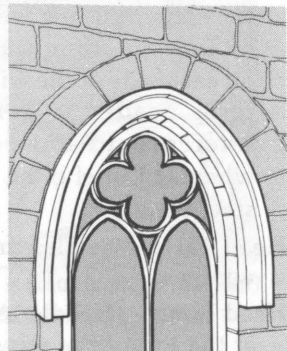
**Flat Skylight** - Roof window opening that is almost flat.



**Float Glass** - Smooth glass formed on top of molten tin surface; a flat glass sheet.

**Flush Glazing** - Glazing which is flush with frame.

**Fluted Rolled Glass** - Sheet of glass impressed with narrow flute patterns.



**Foil** - A lobe on a leaf-shaped curve formed by the cusping of a circle or arch. The number of foils involved is indicated by a prefix, e.g., trefoil (3), quatrefoil (4), etc. Foils are encountered in the windows of Gothic Revival churches and houses.

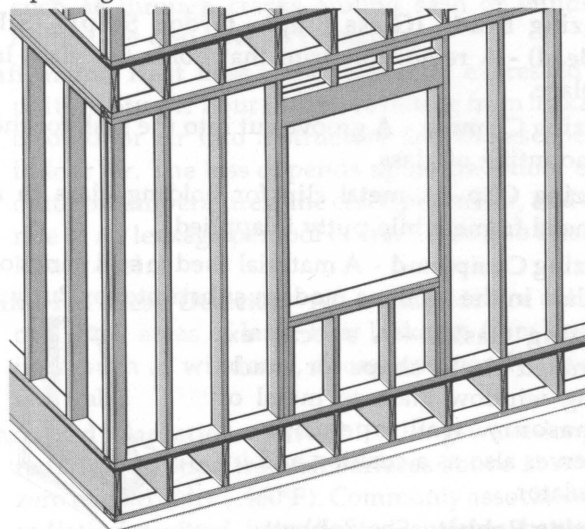
**Folding Casement** - Casement windows hinged together so they can fold into a confined space.

**Folding Shutter** - See Boxing Shutter.

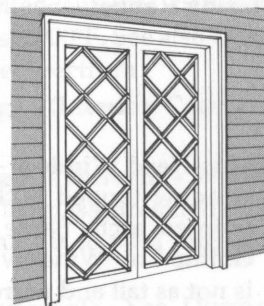
**Forced Convection** - A heat transfer process, aided by mechanical circulation of a liquid (such as water) or of a gas (such as air). This applies to natural wind flow over a window.

**Frame** - See Window Frame.

**Framing** - Structural members to provide a window opening.



**French Window** - Two casement sash hinged on the sides to open in the middle; the sash extends to the floor and serves as a door to a porch or terrace.

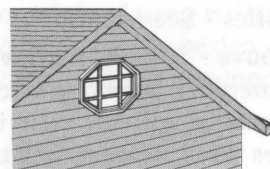


**Friction Hinge** - A window hinge which remains open at any position by means of friction in the hinge.

**Front Putty** - See Face Putty.

## G

**Gable Sash** - A fixed sash in the gable of a building to admit light into an attic.



**Georgian Window** - See Double-hung Window.

**Glass** - An elastic transparent material composed of silica (sand), soda (sodium carbonate), and lime (calcium carbonate) with small quantities of alumina, boric, or magnesia oxides. See Flat Glass.



**Glass Brick** - Glass that has been pressed into a hollow brick form, usually installed in a wall opening or as a decorative structure.

**Glass Stop** - See Glazing Bead.

**Glazier's Point** - (**Spring**) - A thin metal triangle with one point pounded into the frame to hold the glass, then putty is applied to seal the glass.

**Glazing** - The installation of glass in a window opening; also the fenestration or windows.

**Glazing Bar** - See Muntin.

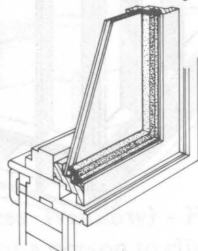
**Glazing Bead** - (**Glass Stop**) - (**Wood Stop**) - (**Sill Bead**) - A removable trim that holds the glass in place.

**Glazing Channel** - A groove cut into the sash for the mounting of glass.

**Glazing Clip** - A metal clip for holding glass in a metal frame while putty is applied.

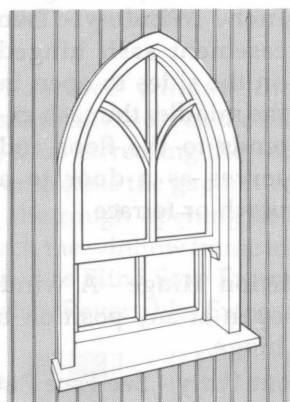
**Glazing Compound** - A material used to seal panes of glass in the frame; a modern substitute for Putty.

**Glazing Gasket** - A special extruded plastic shape for attaching window glass to metal or masonry wall openings. It serves also as a cushion and insulator.



**Glazing Rabbet** - See Rabbet.

**Gothic-Head Window** - A window topped with a pointed arch. Same as Gothic-Top Window. It is not as tall and narrow as the pure Gothic Lancet Window.



**Greenhouse Porch** - An addition to a building on the south side incorporating large glass areas on the walls and roof; a form of passive solar design.

**Grilles** - See Muntin.

**Groove** - A long, narrow cut on the face of a wood member; a groove across the grain is a Dado; one parallel with the grain is a Plough. A groove exposes three surfaces, in contrast with the two surfaces exposed in a Rabbet or Notching. See Rabbetted Joint and Plough.

**Groove Glazing** - See Glazing Channel.

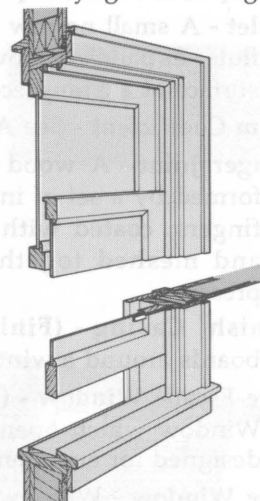
**Ground** - A wood strip around a window frame against which the plaster face will be worked true.

**Ground Casing** - A molding around the window frame which attaches the frame to studs and header and furnishes a ground for plastering; used in old windows.

**Ground Glass** - A light-diffusing glass, usually sandblasted or ground.

**Ground Light** - The reflection of skylight or sunlight from the ground.

**Guillotine Window** - The first double-sash window, with only one movable sash and no counterweights or balancing system. A peg was inserted through a hole in the movable sash and into a corresponding hole in the frame. Its tendency to come slamming down led to the colorful name.



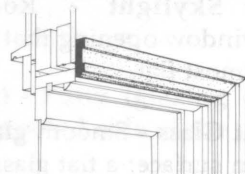
## H

**Hanging** - Mounting a sash in its frame.

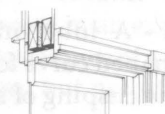
**Hanging Sash** - (**Hung Sash**) - Sash hung on a cord connected to a counterweight.

**Head** - The top or upper member of any element or structure; in windows, it refers to the top of the frame, as in Round Head Window. See Head Jamb.

**Head Casing** - The horizontal exposed framing across the top of the window (See Casing).



**Header** - (**Lintel**) - (**Beam**) - Supporting member or beam above window opening which transfers building weight above to the supporting wall structure on each side of the window. The term header is generally in reference to a wood beam, whereas Lintel often refers to a steel beam.



**Head Flashing** - Flashing installed in a wall over a window.

**Head Jamb** - (**Head**) - All of the horizontal members at the top of the window frame.

**Head Rail** - See Rail.



**Heat-Absorbing Glass - (Tinted Glass)** - Window glass containing chemicals (with grey, bronze, or blue-green tint) which absorb light and heat radiation, and reduce glare and brightness. Shading coefficient of this glass varies from about 50% to 70%.

**Heat Mirror®** - A thin transparent insulating film that is inserted between double glazing which permits transmission of visible light but reflects far-infrared radiation.

**Heat Transfer Coefficient - (U-value)** - A value indicating the rate of heat flow through a building construction, expressed in units of 'Btuh per square foot of surface per degree F. difference between indoor and outdoor air temperature.' This is numerically equal to the 'inverse of the sum of R-values' for the construction.

**High-Light Window** - See Clerestory.

**Hinge** - A movable joint enabling a window to swing open.

**Hit-and-Miss-Window** - A two-part window with the lower sash containing movable ventilation panels.

**Hood** - A decorative cover placed over a window to protect it. See Cap.

**Hoodmold - (Dripmold) (Headmold)** - A molding that projects over the head of an arch and serves to discharge rainwater.

**Hopper Light - (Hopper Vent) - (Hopper Ventilator)** - inward-opening sash hinged at the bottom.

**Horizontal Sliding Window - (Horizontal Slider)** - Windows which slide horizontally.

**Horn - (Lug) - (Stile Lug)** - See Stile Lug.

**Hung Sash** - See Hanging Sash.

**Hung Window** - Window with one or more hanging sashes.

**Hygroscopic** - The ability to 'give off' and 'take on' moisture, as in wood exposed to changes in relative humidity of air.

## I

**Infiltration** - Leakage of outdoor air into a house, such as through cracks around sash or window frame. See also Crack Perimeter.

**Infiltration Heat Loss** - The heat loss, expressed in units of Btu per hour (Btuh), resulting from leakage of outdoor air into a structure and the escape of indoor air. The loss depends upon the indoor and outdoor temperatures, the crack perimeter, and the rate of air leakage per foot of crack (See also Design Heat Loss).

**Infra-red Heat Detector** - An optical device which can show areas of large heat leakages from buildings, such as windows, doors, and poorly insulated walls.

**Infra-red Radiation** - Invisible, long-wave-length radiation emitted from all surfaces above absolute zero temperature (-460°F). Commonly associated with radiation emitted from heated surfaces between room temperature and almost 1000°F. See also Ultra-violet Radiation and Visible Spectrum.

**Inner Casing - (Inside Casing) - (Interior Casing)** - See Inside Casing.

**Insect Screen - (Window Screen) - (Screen)** - Woven mesh of metal, plastic, or fiberglass stretched over a window opening to permit air to pass through, but not insects.

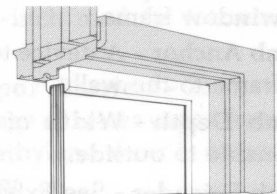
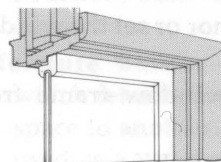
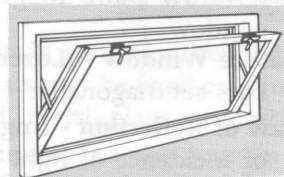
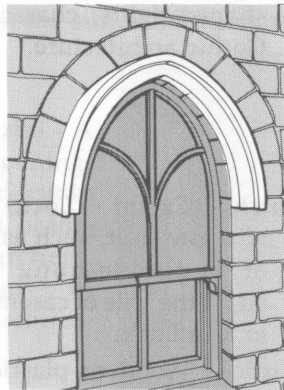
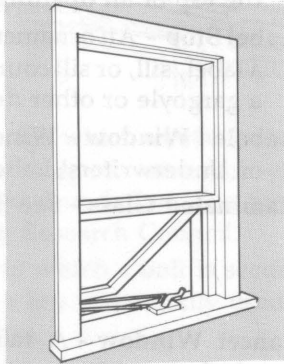
**Inset Dormer - (Recessed, Internal)** - See Dormer Window.

**Inside Casing - (Interior Casing) - (Interior Finish) - (Interior Trim)** - The inside visible molding surrounding the interior of the window frame. See Casing.

**Inside Trim** - See Inside Casing.

**Inside Sill** - See Stool.

**Insulating Glass** - Double- or triple-glazing with an enclosed, dehydrated, and hermetically sealed air space between the panes; the space is commonly from 3/16" to 3/4".



**Insulating Panel** - An interior or exterior covering, door, shutter, or sash to increase the thermal resistance of a window; commonly a non-transparent panel inserted seasonally or during night hours only.

**Insulating Strip** - A strip of insulating material separating metal storm sash from metal window sash; or a plastic separator between two panes of insulating glass.

**Insulated Window** - A window with multiple glazing that provides one or more air spaces between layers of glazing.

**Interior Finish** - See Inside Casing.

**Interior Glazes** - Glazing installed from inside of building.

**Interior Mullion Casing** - The inside trim between adjacent windows. See Mullion.

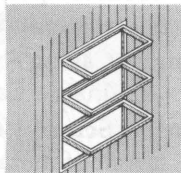
**Interior Trim** - See Inside Casing.

**Interior Venetian Blinds** - A Venetian blind installed between two panes of glass and remotely controlled.

**Internal Dormer - (Inset Dormer)** - See Dormer Window.

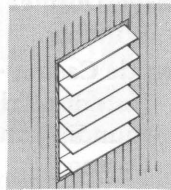
## J

**Jal-Awning Window - (Awning Window)** - Window with several out-swinging, awning-type windows that pivot near the top of the glass and operate in unison.



**Jalousie** - A shutter with slats, which are either fixed or adjustable.

**Jalousie Windows - (Louvered Windows)** - A window composed of overlapping narrow glass, metal, or wood louvers, operated by means of a crank handle for adjusting the louver angles; introduced in the 1950's.



**Jamb** - A vertical member at the side of the window frame; also refers to the horizontal member at the top of the window frame, as in Head Jamb and Window Jamb.

**Jamb** - All of the vertical members at the side of the window frame.

**Jamb Anchor** - A device to anchor or set the window frame to the wall.

**Jamb Depth** - Width of the window frame from inside to outside.

**Jamb Extender** - See Extension Jamb.

**Jamb Horn** - Part of the jamb of the window frame extending beyond the sill or head jamb.

**Jamb Lining** - See Extension Jamb.

**Jamb Shaft** - A free or engaged column decorating the jamb of a window opening; used in medieval architecture.

**Judas Window** - A small window in a door for peering out.

**Jut Window** - See Bay Window or Bow Window.

## K

**Knocked-Down** - Not assembled; parts for a window frame pre-manufactured for assembly at a later date on the job site.

## L

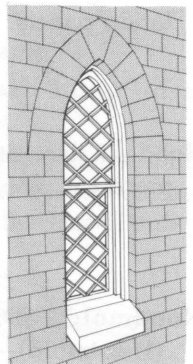
**Label** - A projecting molding by the sides and over the top of an opening. See Hood Mold.

**Label Stop** - An ornamental projection on each end of a label, sill, or sill course. It often takes the shape of a gargoyle or other decorative carving.

**Labeled Window** - Window bearing fire-rating label of Underwriters' Laboratories. See N.B.F.U.

**Laminated Glass** - See Shatter-Proof Glass.

**Lancet Window** - A tall, narrow window with a pointed-arch top, often with leaded diamond shaped lights; characteristic of Gothic architecture.

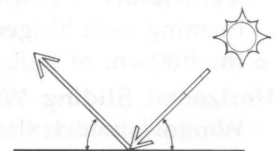


**Latch - (Catch) - (Lock)** - A device which holds a window shut, such as the latch at the meeting rail of a double-hung window or one mounted on the stile of casement windows, often referred to as a Lock.

**Lattice** - Wood or plastic strips set diagonally in a window pane to give the effect of a lattice window.

**Lattice Window - (Lozenge)** - Window with glazing bars set diagonally.

**Law of Reflection** - Angle of incidence of light is equal to the angle of reflection when radiation hits a reflecting surface.



**Laylight** - A glazed ceiling opening for lighting.

**Lead Light - (Lead Glazing) - (Stained Glass) -** Window with small panes of glass set in grooved rods of cast lead (or came). The glass can be clear, colored, or stained.

**Lexan®** - A trade name for a glazing material which is extremely resistant to breakage.

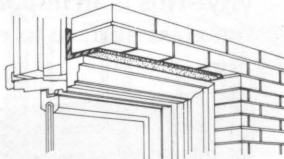
**Lift - (Sash Lift)** - Handle for raising the lower sash in a double-hung window.

**Light - (Lite)** - A window; a pane of glass within a window. Double-hung windows are designated by the number of lights in upper and lower sash, as in six-over-six.

**Light-Fast** - A material or surface which is color stable when exposed to sunlight.

**Lightwell** - An open shaft in a building which provides air and light to windows opening onto the shaft.

**Lintel** - Horizontal member (wood, steel, or stone) over a window opening to support the weight of the wall above (See also Header).

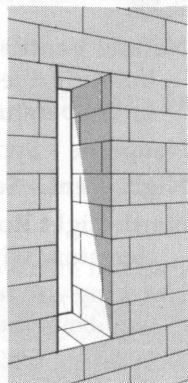


**Lo-Cal House** - A house design which combines passive solar orientation with large R-values for windows, walls, ceiling, and foundation. See Small Homes Council-Building Research Council.

**Lock** - A fastening device in which a bolt is secured and can be operated by a key. Commonly used to refer to Latches or Catches.

**Lock Rail** - See Meeting Rail.

**Lock Stile** - The vertical member (stile) of a casement sash which closes against the surrounding frame.



**Loop Window - (Balustraria)** - A long, narrow, vertical opening, usually widening inward, cut in a medieval wall, parapet, or fortification for use by archers. Modifications appear in Romanesque Revival Architecture.

**Louver** - Slanted fins or slats in a window, ventilator, or Venetian blind; the slats may be fixed or adjustable, and made of wood, metal, glass, or plastic.

**Louvered Window** - A window having louvers or slats that fill all or part of the opening. See Jalousie Window.

**Lozenge** - A diamond-shaped design, as in a window composed of diamond-shaped panes. See Quarry.

**Lucarne** - A small dormer window in a spire or steeply-pitched roof.



**Lug** - See Stile Lug.

**Lug Sill** - A window sill extending beyond the window frame.

**Lunette** - A crescent-shaped window framed by moldings or an arch.

## M

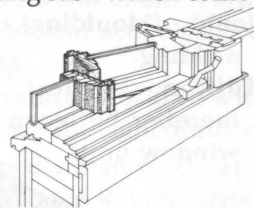
**Margin Light** - See Side Light.

**Marigold Window** - Rose Window.

**Matte-Surfaced Glass** - Etched, ground, or sand-blasted glass that provides diffused light.

**Meeting Rail - (Lock Rail)** - One of the two horizontal members of a double-hung sash which come together. See Check Rail.

**Meeting Stile** - The vertical member in a pair of stiles, as in abutting casement windows.



**Member** - Any structural part of a window, such as a rail, stile, or lintel.

**Metal Window** - A window constructed of metal frame and sash; the metals are commonly aluminum, steel, stainless steel, and bronze.

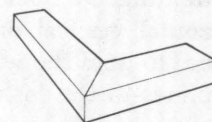
**Micron** - One millionth part of a meter.

**Mil** - One-thousandth of an inch, or 0.0254 millimeter.

**Millimeter - (mm)** - Metric measure for length, one-thousandths of a meter. 25.4mm = 1.0 inch.

**Millwork** - Window sash and other wood products made in a wood-working plant.

**Miter Joint** - Two members joined at an angle, commonly 45 degrees.



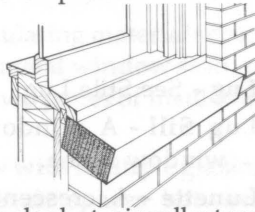
**Module** - A dimension which is repeated in construction, such as a '4-inch module' for window sizes.

**Moisture Barrier - (Vapor Barrier)** - A material which retards the passage of water vapor from one space to another. Polyethylene sheet is commonly used as a vapor retarder.



**Moisture Content** - Percentage of dry weight of material which is composed of water, such as in wood.

**Mold - (Molding)** - A relatively narrow strip of wood used to conceal a joint or to emphasize the ornamentation of a structure.



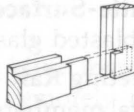
**Mold Stone - (Jamb Stone)**

A stone serving as a window jamb.

**Morse Collector** - The earliest solar hot-air collector; a window with glass in front of heavy metal plate, and air openings for convected flow (patented in 1881). The Trombe Wall is a contemporary version.

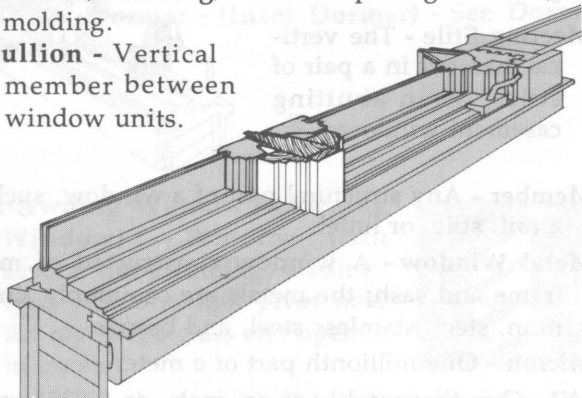
**Mortise** - Cavity into which a tenon is fitted; also for inserting window hardware for locking purposes.

**Mortise and Tenon Joint - (Mortise Joint)** - Joint with an opening (mortise) into which a projection (tenon) is fitted.

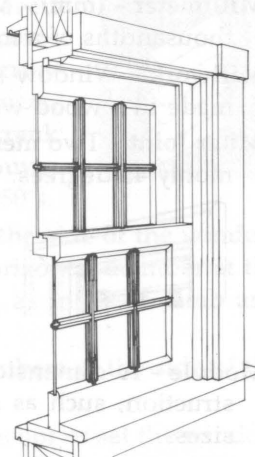


**Mould - (Moulding)** - British spelling of mold, and molding.

**Mullion** - Vertical member between window units.



**Mullion Cover - (Mullion Trim)** - A molding covering the vertical joint between two window frames.



**Muntin - (Sash Bar) - (Window Bar) - (Glazing Bar)** - A secondary framing member (horizontal, vertical, or slanted) to hold the window panes in the sash. This term is often confused with Mullion.

**Muntin Grilles** - Wood, plastic, or metal grilles designed for a single-lite sash to give the appearance of muntins in a multi-lite sash, but are removable for ease in cleaning the window.

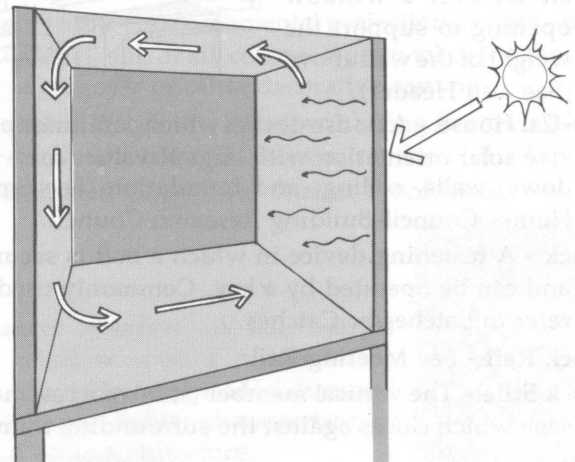
**Multi-Lite Sash** - A sash divided into many lites.

**Mylar®** - Trade name for a clear, durable plastic sheet used for covering an inside storm panel or for a removable, roll-up glazing over an entire window frame.

## N

**Nail** - Common nails and box nails are used in window frame assembly and installation; casing nails are used for assembling heavier exterior moldings; finish nails (and brads) are used for interior trim members.

**Natural Convection** - A heat transfer process involving motion in a fluid (such as air) caused by difference in density of the fluid and the action of gravity. This is an important part of heat transfer from the glass surface to room air. See Forced Convection.



**Natural Ventilation** - Air movement into and out of a building due to wind, or differences in air pressure or temperature.

**Neoprene** - Synthetic material used for gasketing.

**Night Vent** - See Ventlight.

**North-Light Roof** - Sawtooth roof with north-facing clerestory windows, used extensively in factories.

**Notching** - A rectangular cut across the grain of the wood member at the end of the board (See Rabbet).

**N.W.M.A.** - National Woodwork Manufacturer's Association, Inc., 205 West Touhy Ave., Park Ridge, IL 60068.

## O

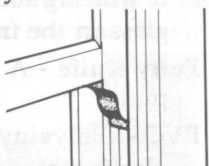
**Obscure Glass - (Visionproof Glass)** - Any textured glass (frosted, etched, fluted, ground, etc.) used for privacy, light diffusion, or decorative effects.



**Oculus** - A round or oval window without tracery or muntins (Oeil-de-Boeuf, Bull's Eye, Rose, Wheel, Cameo).

**Oeil-de-Boeuf Window - Bull's Eye Window** - See Oculus.

**Ogee Curve - (Ogee Molding)** - A reverse flex curve commonly found in window moldings or trim.

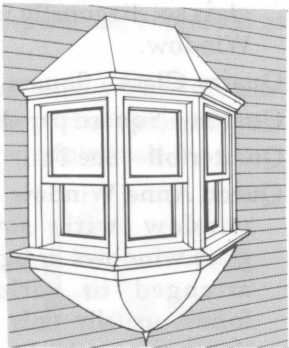


**Operable Transom** - Panel (usually glazed) over door which can be opened for ventilation.

**Operable Window** - Window which can be opened for ventilation.

**Operator** - Crank-operated device for opening and closing casement or jalousie windows.

**Oriel Window** - A window projecting from the wall and carried on brackets, corbels, or a cantilever. Unlike a Bay Window, the projection of an Oriel does not extend all the way to the ground.



**Orientation** - The placement of a room, window, or building with respect to sun, wind, earth, access, or view (See also Solar Orientation).

**Outside Casing - (Outside Facing) - (Outside Trim) - (Exterior Casing)** - That portion of the window frame which is exposed to the outdoors. See Casing.

**Outside Glazing** - Glazing installed from the outside.

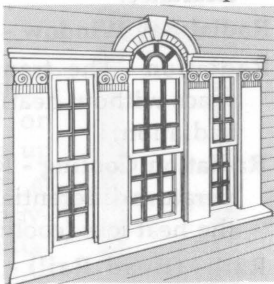
**Outside Sill** - See Sill.

**Overhead Balance - (Coiled Tape, Pullman)** - See Sash Balance.

## P

**Package Trim** - Prefabricated window trim in a package.

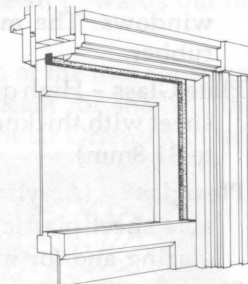
**Palladian Window** - A tripartite window developed by the 16th Century Italian architect Andrea Palladio.



**Pane** - A sheet of glass for glazing a window. After installation, the pane is referred to as a 'light' (lite) or 'window light.'

**Panel Window** - A form of picture window consisting of several sash or fixed glazings, separated by crossbars or mullions, or both.

**Parting Bead - (Parting Strip) - (Parting Stop)** - A vertical strip on each jamb that separates the sashes of a double-hung window.



**Parting Slip** - A thin wood strip separating the sash weights in the weight box of each jamb of old double-hung windows.

**Passive Solar Device** - Any solar collector, storage, or distribution system which functions without motor-driven fan or pump and without electrical sensors or controls. The basic and intrinsic solar device is a south-facing window, usually with multiple glazing, which transmits solar energy, and is also required for view and ventilation. Various adaptations between passive and active solar devices (hybrids) are evolving.

**Patterned Glass** - One or both surfaces of glass with a rolled design; used for privacy and light diffusion.

**Pediment** - A triangular-shaped ornamental cap or hood over a window; in Colonial Revival style.

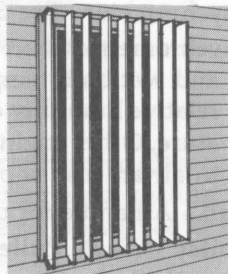
**Percentage Humidity** - Weight of water vapor in air divided by weight of vapor contained in saturated air, expressed as a percentage.

**Perimeter Heating** - A system of heating in which the radiators or registers are located along the exposed wall, usually below windows; heated air from the heating devices counteracts the cold convection flow from the windows.

**Permeability** - The ability of a porous material to permit transmission of water vapor.

**Permeance** - A measure of the transmission of water vapor through a material expressed in units of 'perms.'

**Persienne - (Persiana)** - An external slatted shade or shutter with adjustable slats.



**Picture Window** - Large fixed windows; introduced in 1940's.

**Pivot** - Axis or hardware about which a window rotates.

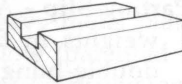
**Pivoted Window** - Window sash which rotates about pivots near the center of the edge of the frame.

**Plastics** - Artificial substances made of organic polymers that can be extruded or molded into various shapes, some of which have been adapted to windows. The material is commonly stiffer than rubber.

**Plate Glass** - High quality, ground and polished glass sheet with thickness from 1/8 to 1-1/4 inch (3.2 mm to 31.8mm).

**Plexiglas® - (Acrylic)** - A trade name for a clear, durable sheet plastic made of acrylic; used for safety glazing and for inside storm panels.

**Plough - (Plow)** - A rectangular groove or slot (with 3 surfaces) cut parallel with the grain (See Dado).



**Plowed and Bored Sash** - A box window frame (in old windows) where the edges of the stiles were ploughed and bored to receive the sash weight cord and to tie the knot.

**Polyethylene** - A semi-transparent plastic sheet commonly used as a vapor retarder but also used as a temporary, low-cost double glazing or storm panel.

**Polysulfide** - See Sealant.

**Polyvinylchloride** - See PVC.

**Preservative** - See Water-Repellent Preservative.

**Pressed Glass** - Glass that has been pressed into shape, such as for glass bricks. See Glass Brick.

**Prime Sash** - The balanced or moving sash of a window unit.

**Prime Window** - Window with single or multiple glazing to which storm sash may be installed.

**Projected Window** - An awning type window that swings either inwards or outwards at the top or the bottom. The 'PIB' or 'project in at bottom' window can be cleaned from the inside.

**Protected Opening** - A window with fire-resistance rating suitable for the wall in which it is located.

**Psychrometer** - See Sling Psychrometer.

**Psychrometric Chart** - A chart which shows dry bulb and wet bulb temperatures used to determine the relative humidity of air and the dew point temperature. Other engineering data referring to moisture in air are also shown.

**Pull** - A handle for opening a window.

**Pulley - (Sash Pulley)** - In older windows, a sash cord attached to a sash weight was carried over this device to a window sash. Four pulleys, located at the top of the jambs, were used for a double-hung window. See Sash Balance.

**Pulley Stile** - Part of the window frame in older windows; a removable vertical board flush with the

frame to allow access to the sash weights and cord.

**Pullman Balance** - See Sash Balance.

**Putty - (Glazing Compound)** - A thick paste made of whiting and linseed oil, used for sealing panes of glass in the frame.

**Putty Knife** - A tool with a flat surface for applying putty.

**PVC - (Polyvinylchloride)** - An extruded or molded plastic material used for window framing and as a thermal barrier for aluminum windows.

## Q

**Quarrel** - A diamond- or square-shaped glass piece set diagonally; a medieval term for small panes of glass set diagonally in Gothic windows. See Lattice Window.

**Quarry Glass** - Square glass piece set diagonally.

**Quarter** - Square panel.

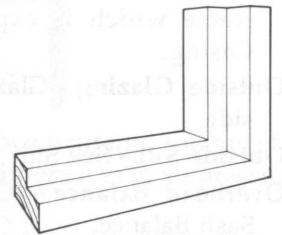
**Quarterfoil** - See Foil.

**Queen Anne Window** - A window with small glass windows or lights arranged in various forms, usually only on the upper sash; began appearing in the 1870's.



## R

**Rabbet** - A rectangular notch (consisting of two surfaces) cut parallel with the grain of wood along the edge. See Notching.



**Rabbeted Joint** - The joint formed by two boards with rabbeted ends, as in some window frames.

**Rabbet Size** - The size of glass opening including clearance.

**Radial Bay Window** - See Bow Window.

**Radiation** - The transmission of energy through space without heating the air between, as in Solar Radiation.

**Radiation Cooling** - Radiant heat loss due to a temperature differential between objects. For instance, the heat loss (cooling) of a roof during the night.

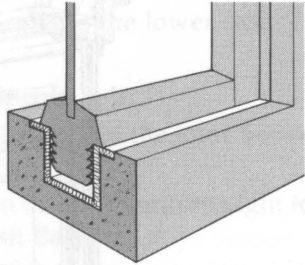
**Rail - (Head Rail) - (Top Rail) - (Bottom Rail) - (Meeting Rail)** - Horizontal member of a window sash.

**Reflection** - See Law of Reflection.

**Reflective Glass** - Window glass coated to reflect radiation striking the surface of the glass.

**Refraction** - The deflection of a light ray from a straight path when it passes at an oblique angle from one medium (such as air) to another (such as glass).

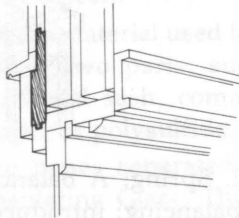
**Reglet** - A plastic or wood molding placed in a concrete or masonry opening to provide a uniform groove for a spline-type gasket to hold window glass. See Dry Glazing.



**Relative Humidity** - Weight of water vapor in air divided by the weight of water vapor in completely saturated air at the same temperature, expressed as a percentage.

**Reveal** - The surface of the jamb for a window, perpendicular to the wall, or the part of the jamb from the wall to the face of the window sash.

**Reversible Extension Blind Stop** - An extension Blind Stop that is rabbeted to receive either 1/2" or 25/32" sheathing.



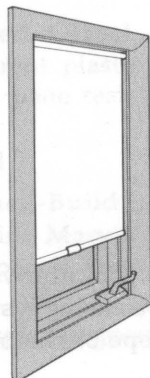
**Reversible Window** - A window sash which can be pivoted around a vertical axis for ease of cleaning.

**Ribbon Window - (Window Band)** - A series of windows in a row across the face of a building.

**Rolled Glass** - A flat glass with a patterned or irregular surface produced by rolling, with varying transparency. Sub-types include flat wire glass, corrugated glass, and figured glass; thickness from 1/8" to 1 1/4" (3.2mm to 31.8 mm).

**Roll-up Screen** - A screen installed on the inside of the house and operated like a roll-up shade. The screen fits into metal track on the side and rolls up into a box at the top. Another model, the roll-down screen, rolls into a box at the bottom.

**Roll-up Shade - (Roller Shade)** - Window shade installed on inside of house which rolls up around a cylindrical holder at the top. Serves to maintain privacy, to reflect some solar radiation, and to reduce convection flow when fully extended.

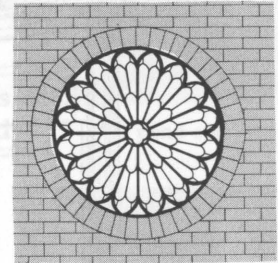


**Roloc** - See Rowlock.

**Roman Shade** - A hanging fabric over a window that serves as an insulated window shade, and which can be rolled, enfolded, or drawn upwards out of the way.

**Roof Overhang** - The projection of the roof construction beyond the wall; significant for shading the windows on a south wall in Solar Oriented building design.

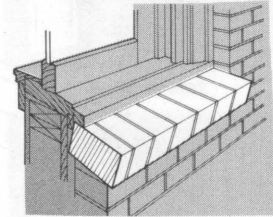
**Rose Window - (Marigold Window)** - The true Rose Window is of circular shape and shows a radial pattern; rarely used in secular buildings.



**Round-Head Window** - A window with a rounded top member.

**Roundel** - A very small circular window; also a circular light resembling the bottom of a bottle. See Oculus Window.

**Rowlock** - Sill made from brick, installed on a slant in the direction of the rainfall.

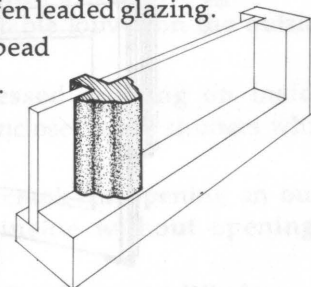


**R-Value - (Thermal Resistance)** - A measure of resistance to heat flow of a material or construction; a higher value indicates a better heat-insulating property. The R-value of an ordinary single-pane sash with a 15 mph wind on one side is about 0.9.

## S

**Saddle Bar** - A light steel bar placed horizontally across a window to stiffen leaded glazing.

**Saddle Bead** - A glazing bead for securing two panes.



**Safety Glass** - A strengthened or reinforced glass that is less subject to breakage or splintering, such as glass for storm doors and some windows. See Tempered Glass, Shatterproof Glass, and Plexiglas®

**Safety Lintel** - A second lintel of wood behind a stone lintel in a window opening.

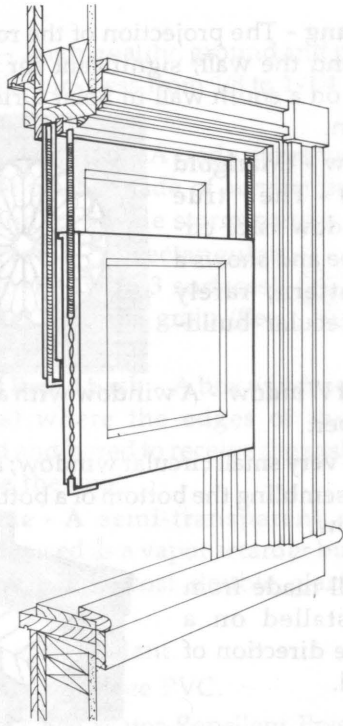
**Sash - (Window Sash)** - Framework of stiles and rails in which the lights of a window are set.

**Sash Adjuster** - See Casement Adjuster.

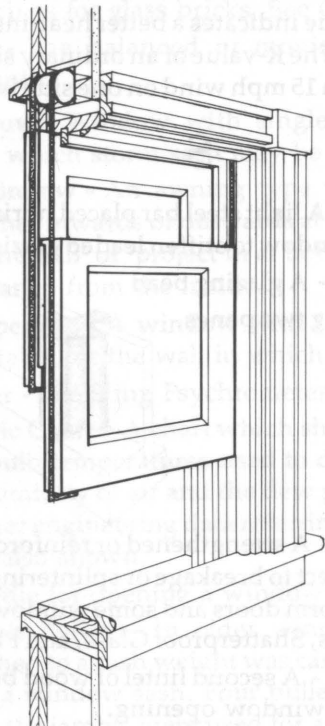
**Sash and Frame** - A window and its cased framing.



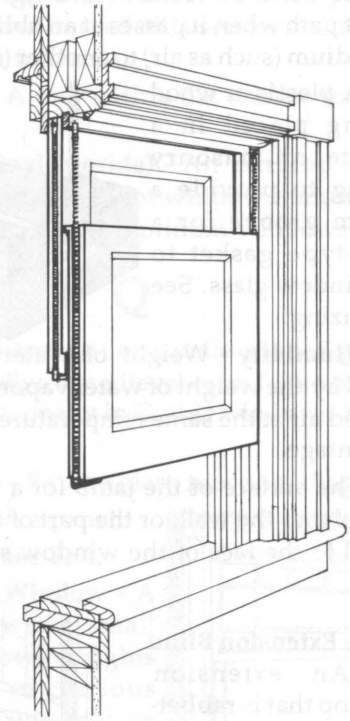
**Sash Balance** - A device for counter-balancing a sash of a double-hung window to hold it in the up position. There are four basic types:



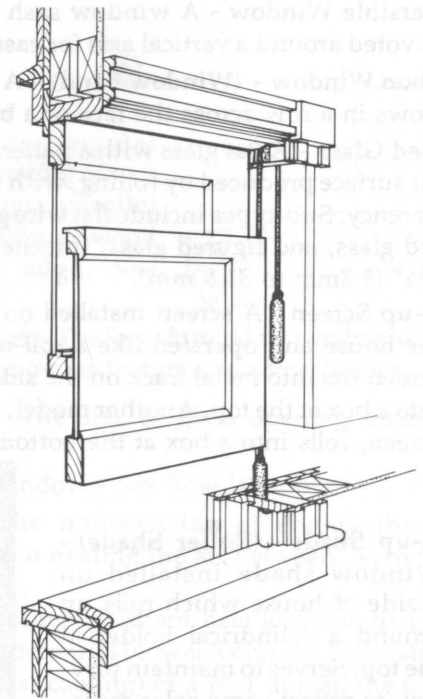
1. Spiral: A balance using a spirally-wound spring;



3. Coiled Tape - (Pullman Balance, Overhead Balance): A coiled steel tape under spring tension for balancing the sash, located in the head jamb of the window frame.



2. Spring: A balance using a spring for counter-balancing; introduced in the 1890's;



4. Counterweight: The most common type of balancing system, utilizing a weight held by a sash rope or chain over a pulley.

**Sash Bar** - See Muntin.

**Sash Cord** - See Cord.

**Sash Chain** - See Chain.

**Sash Center** - A supporting device of two parts for horizontally pivoted sash.

**Sash Lift** - A handle for raising the lower sash.

**Sash Pulley** - See Pulley.

**Sash Spring Bolt** - See Spring Bolt.

**Sash Stop** - A molding that covers the joint between window sash and the jamb.

**Sash Weight** - A cast-iron or lead counterweight for a movable sash. See Sash Balance.

**Schedule** - See Window Schedule.

**Screen** - See Insect Screen.

**Screen Molding** - The trim for covering the edge of screening material on the frame.

**Screen-Wire Cloth** - A close-mesh woven screening material of metal, plastic, or fiberglass for a window screen, to block the entry of insects but permit light, air, and vision through the screen.

**Sealant** - A compressible plastic material used to seal any opening or junction of two parts, such as between the glass and a metal sash, commonly made of silicone, butyl tape, or polysulfide.

**Sealed Double Glass** - Two panes separated by a sealed space. See also Insulating Glass, Thermopane®.

**Section** - A view of an object when it is imagined to be cut through to show its internal structure.

**Shade Screen - (Sun Screen)** - A specially fabricated window screen of sheet material with small narrow louvers formed in place to intercept solar radiation striking a window; the louvers are so small that only extremely small insects can pass through. Also, an awning with fixed louvers of metal or wood construction.

**Shading Coefficient** - A decimal value which is the solar gain of a window, divided by the solar gain for a clear single-glass window of the same size. The shading coefficient of clear, double-glazing is about 0.85 to 0.9.

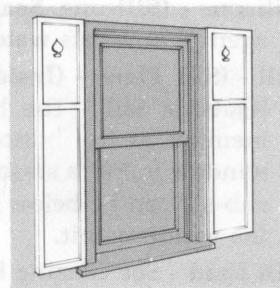
**Shatterproof Glass - (Laminated Glass)** - Two sheets of glass with a transparent plastic sheet sandwiched between to form a pane resistant to shattering.

**Sheet Glass** - Window Glass.

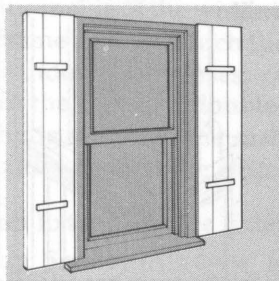
**SHC-BRC** - Small Homes Council-Building Research Council, One East Saint Mary's Road, Champaign, IL 61820. Developer of the Lo-Cal House.

**Show Window** - A window for display of goods (See Cabinet Window).

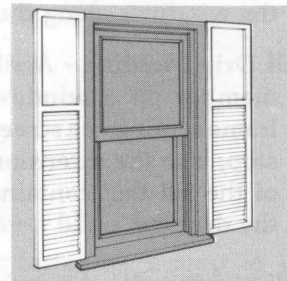
**Shutter - (Blind)** - A frame assembly mounted on a window supporting a panel which shuts out light or view from a window opening; originally for protection, then decoration, and now energy conservation. Some authorities consider solid panels as shutters and louvered panels as blinds.



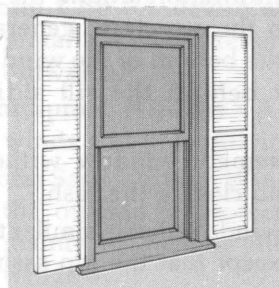
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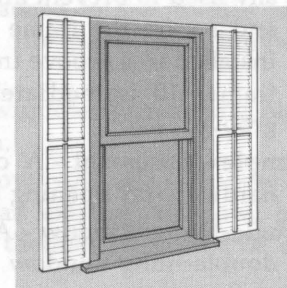
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pand & slat



stationary slat



rolling slat

**Shutter Bar** - A device for securing the shutter in place. Sometimes called a Shutter Dog.

**Shutter Blind** - Adjustable louver on the outside of the window.

**Shutter Box** - A recessed opening on inside of window jambs to enclose inside shutters while in the open position.

**Shutter Operator** - A crank for opening an outside shutter from the inside without opening the window.

**Side-hung Window** - See Casement Window.

**Side Jamb** - The upright member forming the sides of the frame.

**Side Light - (Margin Light)** - A fixed often narrow glass window next to a door opening (or window).

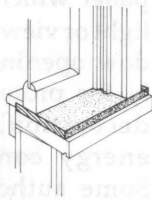
**Side Stop** - The vertical window stop on either side of the window or door frame opening.

**Signal Sash Fastener** - A device for fastening double-hung windows that require a long pole to reach the fastener.

**Silica Gel** - See Dessicant.

**Silicone** - (**Silicone Sealer**) - An enduring sealing agent that resists water. See Sealant.

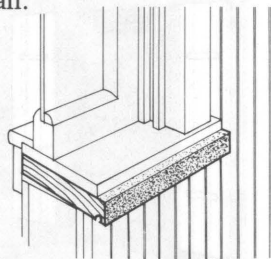
**Sill** - (**Sill Plate**) - (**Inside Sill**) - (**Outside Sill**) - The horizontal member at the bottom of the window frame; a masonry sill or sub-sill can be below the sill of the window unit.



**Sill Bead** - See Glazing Bead.

**Sill Block** - A concrete or stone unit for the sill.

**Sill Course** - A continuation of the masonry sills of the windows along the wall.



**Sill Drip Molding** - A sill member on a window frame serving as a screen stop; also the extension of the sill that contains the drip cut.

**Sill Windbreak** - A window frame member occasionally used to prevent air infiltration around the sill and secure the frame to the structure; generally installed in a groove in the bottom of the window frame sill immediately behind the sill siding groove.

**Simplex Casement** - A casement window without hardware for opening and closing the sash.

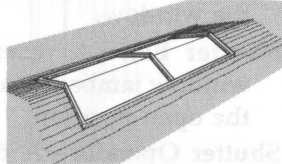
**Single-Hung Window** - A window that is similar to a double-hung window except that the top sash is stationary.

**Single-Lite Sash** - A sash with only one lite.

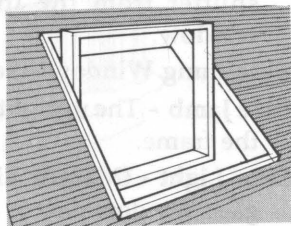
**Single-Strength Glass** - Glass with thickness between 0.085" to 0.100" (2.16 mm to 2.57 mm).

**Skylight** - (**Sky Shine**) - Light received from the sky away from the sun.

**Skylight** - A window in the roof.

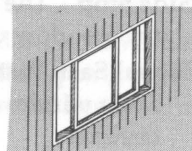


**Skylight (Operable or Pivoting)** - A relatively new product which gains light, ventilation, and a means of egress from attic spaces.



**Slave Windows** - See Eyebrow Windows.

**Sliding Sash** - (**Sliding Windows**) - A window which moves horizontally in grooves or tracks.



**Sling Psychrometer** - A measuring instrument with two thermometers (dry-bulb and wet-bulb) used for determining the dewpoint and relative humidity of air; its relation to windows is ascertaining the point at which moisture will condense on the inside surface of the glass. See Psychrometric Chart.



**Slip-Head Sash Unit** - A sash that slips into a hidden pocket in the wall above the frame. See Boxhead Window.

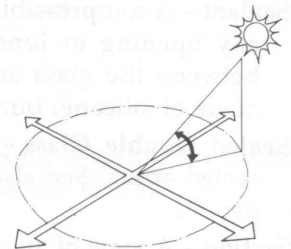
**Slot Ventilator** - An opening in the lower part of a wooden storm sash for venting the air space between the main and storm sashes.

**Small Homes Council-Building Research Council**  
See SHC-BRC.

**Soft Glass** - Window glass.

**Soft Light** - A light which produces poorly defined shadows.

**Solar Altitude** - The angle between the sun and the horizontal plane of the earth.



**Solar Heat Gain** - Heat from solar radiation that enters a building.

**Solar House** - A house designed for effective use of solar heat. See Active Solar Device and Passive Solar Device.

**Solar Orientation** - A building placed on a lot so that the long dimension faces south and a majority of the windows are south-facing.

**Solar Radiation** - The total radiation of energy from the sun, including ultra-violet and infra-red wave lengths as well as visible light.

**Solar Screen** - A sun-shading device, such as screens, panels, louvers, or blinds, installed to intercept solar radiation.

**Solid Frame** - A window frame made from a single piece of lumber (rare).

**Sound-Insulating Glass** - **Sound-Resistive Glass** - Double glass fixed on resilient mountings and separated so as to reduce sound transmission.

**Sound-Resistive Glass** - See Sound-Insulating Glass.

**Spandrel** - An exterior wall panel filling the space beneath a window sill, usually extending to the top of the window below in multi-story construction.



**Specification** - Written document often accompanying architectural drawings giving such details as scope of work, materials to be used, installation method, and quality of workmanship for work under a contract.

**Specific Heat** - Amount of heat required to raise the temperature of one pound of a given substance one degree F. divided by the heat required to raise one pound of water one degree F. A ratio used to determine the heat storage capacity of a substance.

**Specular Surface** - A mirrored surface which reflects light at the same angle as the light falling on the surface. See Law of Reflection.

**Spiral Balance** - See Sash Balance.

**Splayed Window** - A window unit set at an angle to the wall.

**Spline** - A rectangular strip of wood or metal inserted between two boards which have been slotted to receive it.

**Sprig** - See Glazier's Point.

**Spring Balance** - See Sash Balance.

**Spring Bolt** - A fastener for holding the sash in a fixed location by means of a spring-loaded bolt in the stile entering a hole in the jamb.

**Stacked Window Units** - A combined grouping of awning, hopper, casement, or non-operative windows to form a large glazed unit.

**Stained Glass Window** - A window with a painted scene or pattern that has been fired into the glass. Windows with plain colored glass set in lead are also called stained glass. See Lead Light.

**Stationary Sash** - A fixed sash; also referred to as a picture, studio, vista, or view sash.

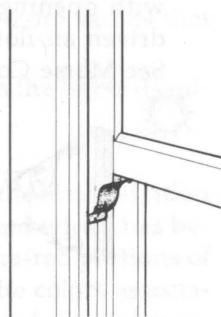
**Stay** - See Casement Stay.

**S.W.I.** - Steel Window Institute, 2130 Keith Building, Cleveland, OH 44115.

**Stiffener** - A secondary member to prevent a plate or frame from buckling.

**Stile** - The vertical-edge members of a window sash.

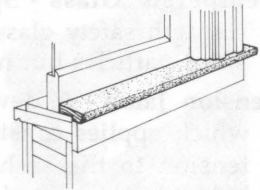
**Stile Lug - (Lug) - (Horn)** - One of two extensions of the sash stiles to support the upper sash of a double-hung window.



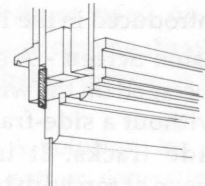
**Stock** - Lumber, window units, trim and other materials in standard sizes and dimensions commonly available from suppliers.

**Stock Millwork - (Stock Size)** - Manufactured millwork, such as window units, sold in standard sizes and styles, and available from suppliers.

**Stool** - A shelf-like board of the interior part of the window sill, against which the bottom rail of the sash closes.



**Stop - (Bead, Side Stop, Window Stop, Parting Stop)** - The molding on the inside of the window frame against which the window sash closes, or in the case of a double-hung window, the sash slides against the stop.



**Stop Extender** - See Extension Blind Stop.

**Stop Screw** - A screw for fastening a stop to the window frame.

**Storm Clip** - A device attached to the muntin of a metal sash to prevent the pane from moving outwards.

**Stormproof Window** - A window for resisting high winds and precipitation.

**Storm Sash - (Storm Window)** - An extra window on the outside to protect an existing window, but mainly to increase the thermal resistance of the window.

**Storm Panel** - An exterior covering, door, shutter, or sash to protect the window during a storm.

**Studio Window** - See Stationary Sash.

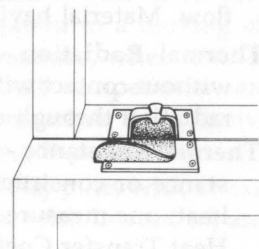
**Sunblind** - See Shade Screen.

**Sunburst Light** - See Fan Light.

**Sun Control Film** - A tinted or reflective film applied to the inside surface of window glass, causing a reduction in visible, ultra-violet, and total transmission of solar radiation. Shading coefficients can be as low as 0.25. Such films serve to reduce the solar heat gain in summer, and to reduce glare. Some can be removed and reapplied with changing seasons.

**Sun Screen** - See Shade Screen.

**Sweep Lock** - A sash fastener located at the meeting rails of a double-hung window, which rotates and clamps the two rails closer together.



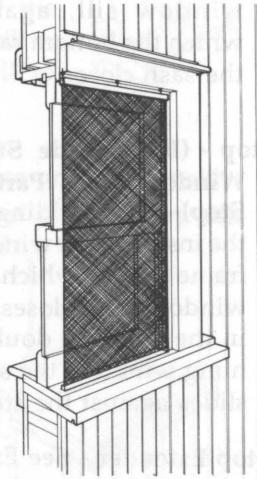
## T

**Tape Balance** - See Sash Balance

**Tempered Glass** - Special heat-treated, high-strength safety glass which shatters into pebble-sized particles but not into slivers.

**Tension Jamb** - A device which applies constant tension to the sash to hold it in place; used instead of sash weights; introduced in the 1930's.

**Tension Screen** - A screen installed on the window without a side-frame or side tracks. It is fastened at top with hooks, and a tensioning device, easily released, holds the screen at the bottom.



**Therm** - See Diocletian Window. In technical usage, the term is a convenient measure of heating value, namely 100,000 Btu. One therm is roughly equivalent to the heating value of 100 cubic feet of natural (methane) gas.

**Thermal Barrier - (Thermal Break)** - A material of high thermal resistance placed between two metal sash, or installed between adjoining metal framing of metal windows, in order to reduce thermal conduction from indoors to outdoors.

**Thermal Conduction** - Heat transfer through a material by contact of one molecule to the next. Heat flows from a high temperature area to one of lower temperature.

**Thermal Conductivity** - Heat transfer property of materials expressed in units of 'Btu per hour per inch of thickness per square foot of surface per one degree F. temperature difference.' Referred to by the letter 'k.'

**Thermal Conductance** - Same as Thermal Conductivity except thickness is 'as stated' rather than one inch. Referred to by the letter 'C'.

**Thermal Expansion** - Change in dimension of a material as a result of temperature change.

**Thermal Insulation** - A material that resists heat flow. Material having a high R-value.

**Thermal Radiation** - Heat transfer through space without contact with a solid substance, as in solar radiation through empty space.

**Thermal Resistance - (R-value)** - A property of a substance or construction which retards the flow of heat; one measure of this property is R-value. See Heat Transfer Coefficient.

**Thermopane®** - A trade name for an insulating glass, or double-glazing.

**Tinted Glass** - See Heat-Absorbing Glass.

**Top Hung-in Window** - An awning window pivoted at the top and with the bottom swinging-in. See also Projected Window.

**Top Rail** - See Rail.

**Tracery** - Ornamental work consisting of delicate intersecting lines of muntins or glazing bars that form a design in a window.

**Transom - (Transom Bar)** - A horizontal member separating a door from a window panel above the door, or separating one window above another.

**Transom Lift** - A device for opening and closing the transom light.

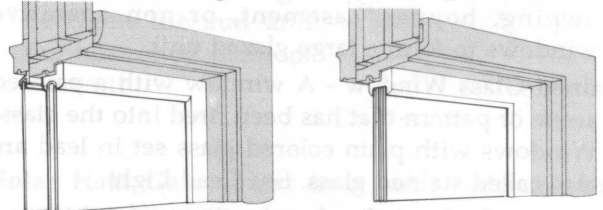
**Transom Light - (Transom Window)** - The window sash located above a door.

**Trefoil** - See Foil.

**Trellis Window** - See Lattice Window.

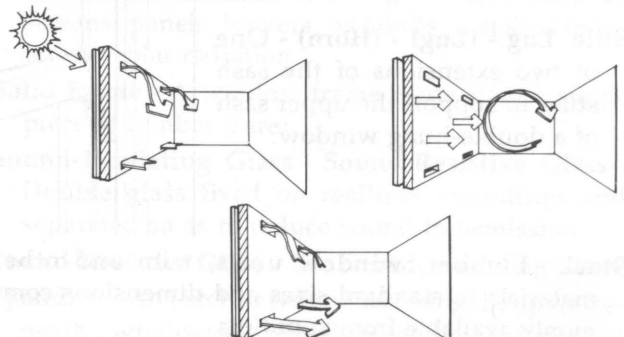
**Trim** - Visible molding surrounding a window opening. See Casing.

**Triple Glazing** - Three panes of glass with two air spaces between, commonly consisting of an insulating glass with a separate storm sash. Also available as an Insulating Window in a single frame.



**Triple Window** - A term generally referring to any tripartite group of windows with square heads. These are frequently found on Colonial Revival houses; they suggest Palladian Windows but are less expensive to build.

**Trombe Wall** - One form of passive solar energy collector. A window with a masonry wall behind it to absorb radiation coming through the window, often with openings in the wall for convective or fan-driven air flow to heat the room behind the wall. See Morse Collector.



**Twindow®** - A trade name for an insulating glass, or double-glazing.

**Two-Light Window** - A window which is two panes high or two panes wide.

## U

**Ultra-violet Radiation** - Extremely short wave length invisible radiation, which is a component of solar radiation, and merges into the visible spectrum; attributed as a source of skin sunburn and color fading of draperies and carpeting.

**Underwriters' Laboratories** - The testing laboratories operated by the American Insurance Association.

**U-value** - See Heat Transfer Coefficient

## V

**Vapor Barrier - (Vapor Retarder)** - A membrane or coating which resists passage of water vapor from a region of high vapor pressure to low pressure, more accurately called a Vapor Retarder.

**Vapor Pressure** - That part of the total pressure of air which is due to the presence of water vapor. Vapor travels from a region of high vapor pressure to low pressure.

**Venetian Blind** - A light-controlling shading device consisting of overlapping thin horizontal slats, which can be raised or adjusted from wide open to closed positions by varying the tilt of the slats. See also Interior Venetian Blind.

**Venetian Window** - See Palladian Window.

**Ventlight - (Vent Sash) - (Night Vent)** - A small pane which can be opened in a larger sash to provide ventilation even with the larger sash closed.

**Vertically-Pivoted Window** - See Reversible Window.

**Vertical Sliding Window** - One or more sashes that move in a vertical direction.

**View Sash** - A picture window with the lights divided by muntins.

**Vinyl** - See PVC.

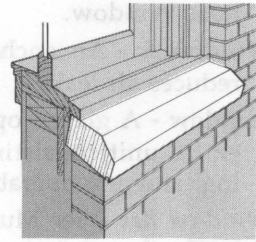
**Visible Spectrum** - That portion of the total radiation that is visible to the human eye and which lies between the ultra-violet and the infra-red portions of the electromagnetic spectrum. The colors associated with the visible spectrum range from violet, indigo, blue, green, yellow, orange, through red.

**Visible-Proof Glass** - See Obscure Glass.

**Vista Window** - See Stationary Sash.

## W

**Wash Cut** - A beveled cut in a stone sill to divert water.



**Water Drip** - A molding sometimes used on the exterior surface of an inswinging casement sash in order to prevent water from being driven in over the sill.

**Water-Repellent Preservative** - A solution for protecting wood parts from the weather, consisting of wood preservative and a water repellent.

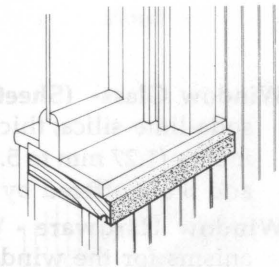
**Weatherseal** - A device that reduces the leakage of outdoor air and precipitation around the window frame into the structure.

**Weatherstrip** - A strip of resilient material for covering the joint between the window sash and frame in order to reduce air leaks and prevent water from entering the structure.

**Weathertight** - Sealed to prevent entry of air and precipitation into the structure.

**Weep Cut - (Drip Cut)** -

A groove in the underside of a horizontal board or masonry unit (such as a sill), which projects beyond the wall surface below to prevent water from moving back toward the wall surface.



**Weephole** - Small holes drilled along the bottom edge of storm sash or combination storm-screens to permit moisture condensation or wind-driven rain to drain away from the sill to the outdoors.

**Weight Box - (Box Window Frame)** - A hollow cavity on each side of a double-hung window to hold the sash weights.

**Wet-Bulb Temperature** - The air temperature recorded by a thermometer whose bulb is covered with a wet wick and is exposed to a moving air stream. The wet-bulb temperature, when used in conjunction with the dry-bulb temperature, enables the observer to determine the relative humidity of the air. See Sling Psychrometer.

**White-Lead Putty** - A good quality putty with at least 10 percent white lead mixed with linseed oil and calcium carbonate.



**Wheel Window - (Catherine Wheel)** - A round window with muntins radiating from the center, as in the spokes of a wheel. See Cameo Window and Rose Window.

**Windbreak** - An anchor strip or blind stop which reduces air leaks.

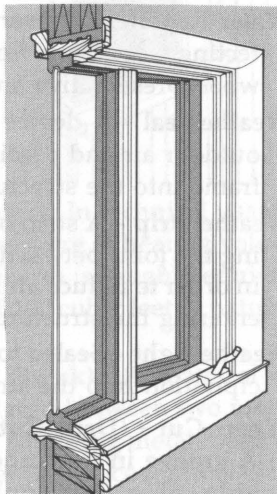
**Window** - A glazed opening in an external wall; an entire unit consisting of a frame, sash and glazing, and any operable elements.

**Window Bar** - See Muntin.

**Window Band** - See Ribbon Window.

**Window Casing** - See Casing.

**Window Catch** - A fastener attached to the sash to prevent sash from being opened from the outside.



**Window Frame** - The fixed frame of a window which holds the sash or casement as well as hardware.

**Window Glass- (Sheet Glass)** - A glass made from soda-lime-silica; thickness from 0.05 inches to 0.22 inches (1.27 mm to 5.59 mm). Three grades AA, A, and B are offered by the glass manufacturers.

**Window Hardware** - Various devices and mechanisms for the window including: catches, cords and chains, fasteners and locks, hinges and pivots, lifts and pulls, pulleys and sash weights, sash balances, and stays.

**Window Lift** - See Sash Lift.

**Window Sash** - See Sash.

**Window Schedule** - A listing of windows required in a given house, stating types, sizes, number of lights, manufacturer, and any special needs.

**Window Screen** - See Insect Screen.

**Window Spring Bolt** - See Spring Bolt.

**Window Stop** - A molding to hold the bottom sash of a double-hung window in place, sometimes called a check stop; also the weatherstripping of the side window jamb.

**Window Unit** - A complete window with sash and frame.

**Window Wheel** - See Wheel Window.

**Wind Pressure** - The pressure produced by stopping the wind velocity; the main cause of air infiltration.

**Wire Glass** - A glass with inner wire mesh for strength and fire-retardant qualities.

**Wood** - For window frame and trim, white pine and oak were commonly used in early windows; since 1930, treated ponderosa pine has been commonly used.

**Wood Moisture Content** - The weight of moisture in wood, compared with the weight of completely dried wood, expressed in percent. Moisture contents of 6 percent to 12 percent at the time of fabrication are specified in the commercial standards.

**Wood Stop** - See Glazing Bead.

**Wood Window** - A window made of wood members.

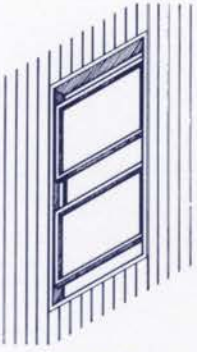
**Worm-Type Hardware** - A device for opening and closing a casement or awning-type sash by means of a crank.

## Y

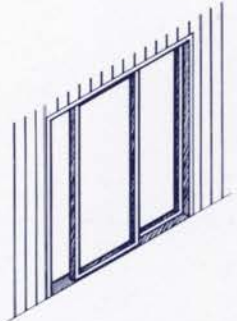
**Yoke** - The head window jamb in a box window frame.

**Yorkshire Light** - A window with one or more fixed sash and a horizontally moving sash.

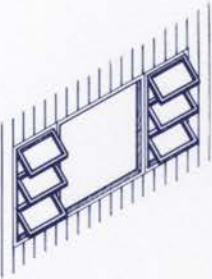
## WINDOW TYPES



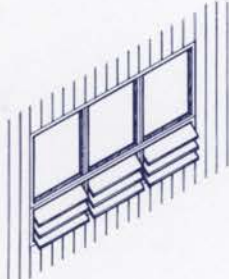
Triple-hung



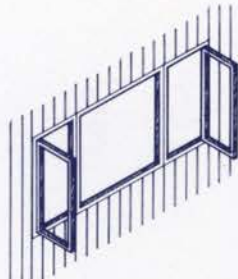
Sliding Patio Door



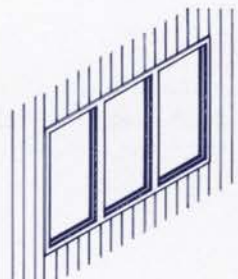
Combo-Awning



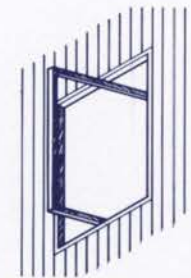
Combo-Jalousie



Combo-Casement



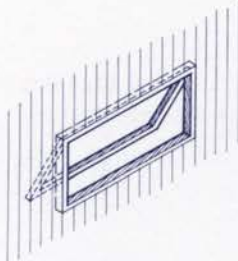
Panel



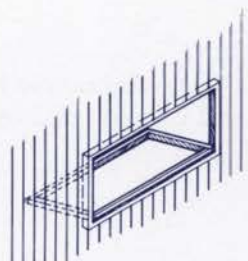
Vertical Pivoted



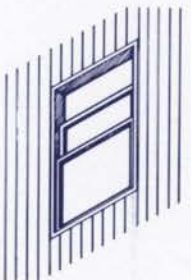
Jalousie



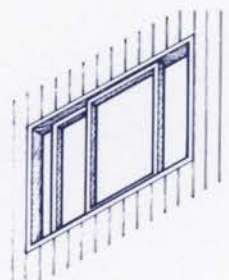
Awning



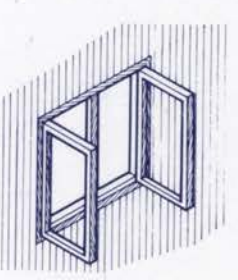
Hopper



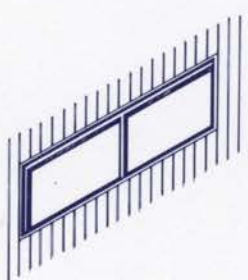
Double-Hung



Horizontal Slider



Casement



Ribbon