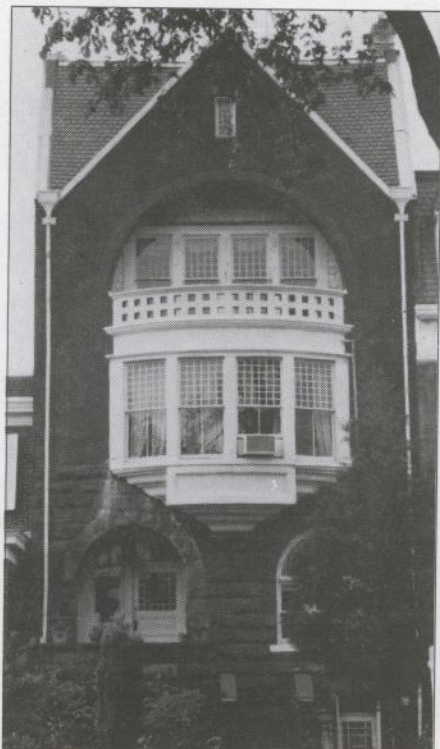


# Guidelines

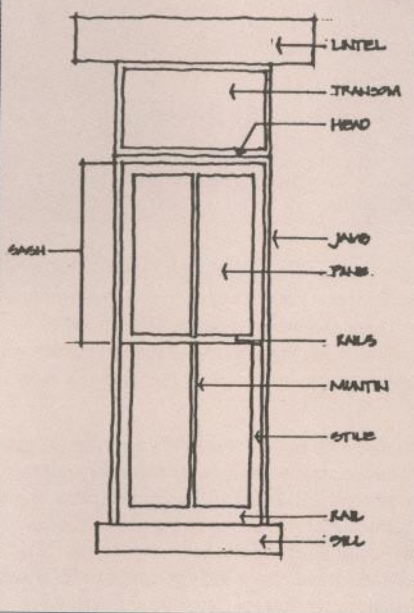
## WINDOWS: THE EYES OF A BUILDING



**W**indows let the world in or exclude it. They can admit a spring breeze and a bird's call or keep out winter winds and rain. They flood a room in light or make the merest connection to the outside from a sanctum. Certainly, the world is different viewed from a parsimonious, fixed window obscured by security grilles than seen from a generous open window.

Windows do a lot for us and our buildings. Besides providing light, ventilation, and view, windows help create the architectural character of our houses inside and out.

A variety of window types and sizes have been associated with particular building styles over the years. Sash, or double-hung windows, became the dominant window type in this country in the 18th century with the popular Georgian style. Prior to that, mediievally-derived colonial period buildings used small many-paned casement windows. (A case



ment window is one in which the sash swings open along its entire length. Casement windows may swing in or out.) A variant on the double-hung window, the triple-hung sash window, was found on some of the grand post-Revolution houses of the United States. Windows of the Georgian, Federal, Adam, and Jeffersonian styles were multipaned, sometimes with as many as sixteen panes ("lights") in one sash of a large window. The dividing strips between panes, horizontal or vertical, called muntins, were thicker and more robust in



506 East Capitol Street, left, illustrates the importance of "curb appeal" even in the 19th century. The front elevation has many very decorative windows. Note the elaborate Queen Ann-style sash on the second and third floors.

Anatomy of a Window, center. Double-hung window with two-over-two sash.

Saint Peter's Rectory, above, has the semi-circular arches and rock faced stone characteristic of the Richardsonian Romanesque style.

Georgian-style windows than those used during the later Federal period. (People sometimes refer to muntins as "mullions," but a mullion is technically a vertical member between windows or doors.)

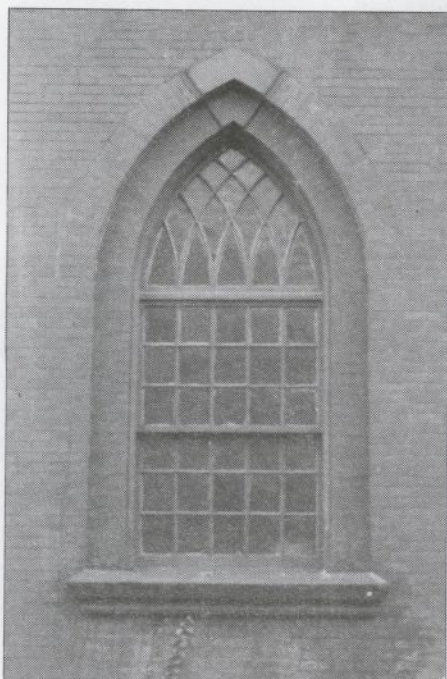
Front doors and windows seem to be prime candidates for "improvement" in the Capitol Hill Historic District. Poorly maintained double-hung, single-glazed windows *can* be breezy in the winter, but homeowners should not assume their windows must be replaced. Many sales claims of the vigorous replacement window industry are just not true: windows *are* reviewed as part of the permit process in the Historic District and there is no construction material known to human-kind that is totally maintenance free.

This guideline discusses historic windows and options for maintenance, repair, replacement, security grilles, sun shading, and shutters.

**How windows work.** The top or bottom sash of double-hung windows slides up or down in front of the other sash. This operation is generally assisted by a system of weights and pulleys, a common repair and maintenance item. Hardware for the typical double-hung window is a latch at the meeting rails of the sash and one or two pulls on the

JUDITH M. CAPEN AIA





Most of Capitol Hill's Gothic windows and pointed arches are found on churches such as is this window on the Capitol Hill Presbyterian Church, Fourth and Independence Avenue, S.E. One occasionally finds a pointed arch on a row house as at 643 A Street, N.E., center top.

bottom sash. Often this hardware is brass or brass-plate with embossed patterns.

Awning windows have top-hinged horizontal sash, the bottom edge of which swings out. A hopper light is bottom hinged, inward opening.

A single-hung window is one with a single sash, hung and balanced like a double-hung window. The sash may slide upward into a pocket in the wall or may slide in front of a fixed sash, giving the appearance of a double-hung window

## CAPITOL HILL PATTERNS AND PRECEDENTS

**Window patterns.** Capitol Hill's more highly developed front facades, 19th century curb appeal reflecting issues of marketability faced by 19th century entrepreneurial builders, contrast with minimally developed rear elevations. A front parlor might have four windows in its bay, while the second parlor might have only a single window looking into a dogleg light well. (The narrower rear section of row houses is known as the "dogleg.") The rooms in the dogleg itself had a minimum number of windows. Sometimes a rear elevation of a dogleg that could easily accommodate four openings would have only two: a door at the main floor and one window at the second floor. Two room deep houses that were three bays wide in the front would have only two vertical rows of windows in the rear. Just as today's developers minimize windows on sides and backs to maximize profits, Capitol Hill's Victorian-era builders bought fewer and less expensive windows for rear elevations and doglegs.

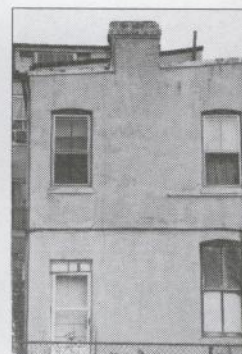
The multiplicity of small panes of glass before



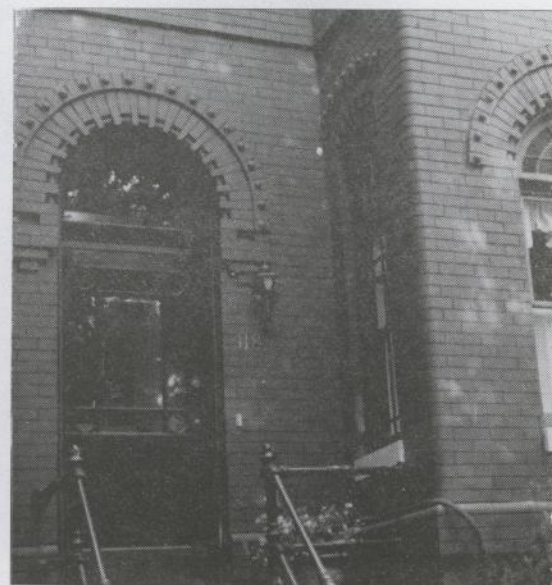
Quintessential Queen Anne-style sash at 322 East Capitol Street, center, not only incorporates the characteristic small panes of glass around a larger central light in the upper sash, but also illustrates a straight-headed window in a segmental arched opening. 118 12th Street, S.E., right, has a Queen Anne transom in a three centered arch next to a door of Queen Anne character under a semicircular arched transom. Overall, this house has a more explicit Queen Anne character than found on many Capitol Hill houses.

the mid-19th century was largely an artifact of glass manufacturing technology: as technology advanced in the second half of the 19th century, panes of glass became progressively larger. Thus, the best late Victorian-era houses had one-over-one (1/1) sash, less grand houses had two-over-two (2/2) sash. Because larger panes of glass were more expensive, builders often used the more expensive windows on the fronts of houses, and windows with smaller panes on sides and rears. One can often stand in a Capitol Hill row house and see 1/1 windows in the front parlor and 6/6 or 2/2 windows in the rear parlor.

Technology also helped shape the exterior stylistic expression of windows. Many Italian houses have elaborate window hoods (the projecting "eyebrows," of greater or lesser elaborateness, at the tops of windows, with vertical sections, or "drops," extending down the sides of the windows) made possible because they were mass produced in cast iron. Other windows are trimmed with pressed metal elements or decorated with turned posts; both machine-produced.



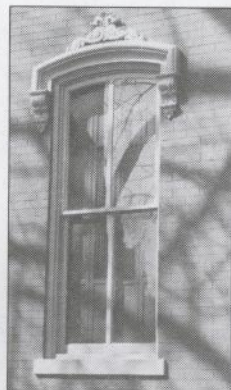
Left Rear elevations have minimal openings. Right This gridded stained glass transom is likewise Queen Anne in character under a segmented arch with a straight top, at 104 North Carolina Avenue, S.E.



**Window Styles.** Capitol Hill's building stock spans nearly two centuries and many different building styles. Building style on the facade of a row house was limited to cornice, window and entrance treatments, bays, and various two dimensional decorative expressions, such as water tables and decorative pressed bricks. With such a limited palette, window types, styles and treatments are central to stylistic expression.

The Gothic Revival, Queen Anne, Richardsonian Romanesque and other styles all had window types and opening styles associated with them. Tracery or Gothic arches exemplified the Gothic style. Windows were often paired in the Italian and French Second Empire styles, and elaborate window hoods were a hallmark of the Italian. Small-paned casement or double-hung windows with upper sash bordered by little square panes, often colored, typified the Queen Anne style. Transomed and/or semicircular arches characterized the Romanesque style. While Capitol Hill's houses





600 East Capitol Street



These two windows are found on 600 East Capitol Street, top: one on the front, one on the side. On the front the segmental arch is trimmed with a beautiful example of industrialization applied to the Italian style: the elaborate window hood is manufactured cast iron. Note the interior shutters on both windows and the mounting brackets for exterior shutters on the side window. Even though this is a corner house with both the front and side highly visible, the Victorian builders did exactly what builders today do: they used more expensive face brick with butter joints and the elaborate window hoods on the front, changing to common brick and simple hoods on the side.

200 East Capitol Street, top right, has semicircular arched openings on the second floor above segmentally arched openings on the first floor. The large paired window, separated by a turned post, has a single stained glass transom.

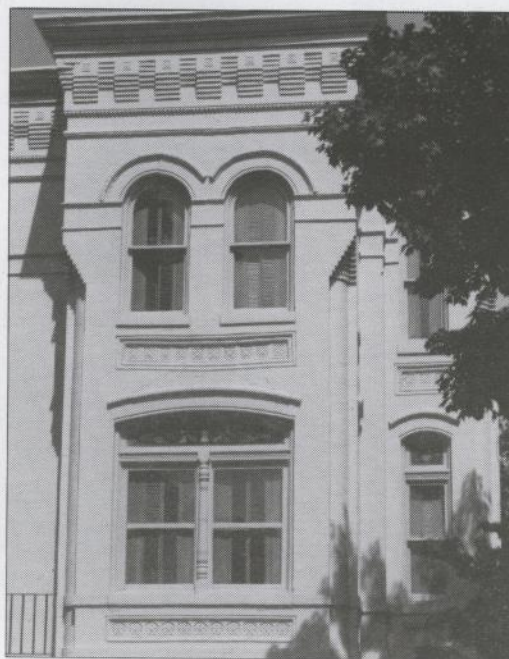
Triangular-arched windows, at 427-433 2nd Street, S.E., above, are rare on Capitol Hill, as is the exotic revival style in which they are found.



512-14 East Capitol Street have different Italian-style window hoods than Italian-style neighbors at 600-606 East Capitol just across the street, but are both quite characteristic of the style, illustrating the diversity found within a single building style.

include examples of all these types of windows, the most common window type is the two-over-two or one-over-one double-hung sash window in wood. Transoms over doors and windows are extremely common, as are bay front paired windows separated by a turned or decorated post.

In the late 19th and early 20th centuries, revival styles (especially Colonial) became popular, and multi-paned windows reappeared. On Capitol Hill this is seen in the six-over-one sash found in the dormer windows on the mansard roofs of porch



## BASIC ADVICE ON WINDOWS

*Maintain and repair.*



*Upgrade thermal performance of old windows with storm windows, either:*

*historically accurate wood storm sash or other storm sash originally found on house*

*interior storm panels*

*exterior aluminum triple track storm windows with divisions that reflect the windows underneath, painted to match the sash color.*



*Replace sash (if sash is missing) with wood sash of the same size and configuration as the missing sash.*

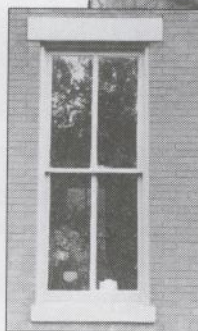


*Replace the entire window (including frame) only if the sash is missing and/or seriously deteriorated, frame is deteriorated, or if replacing an inappropriate replacement window. Replace with new windows of the same size and configuration as the originals, in the full original opening.*





*Replication of the missing part of the drop (the vertical section of the "eyebrow") of this elaborate Italian window hood would restore the original appearance.*

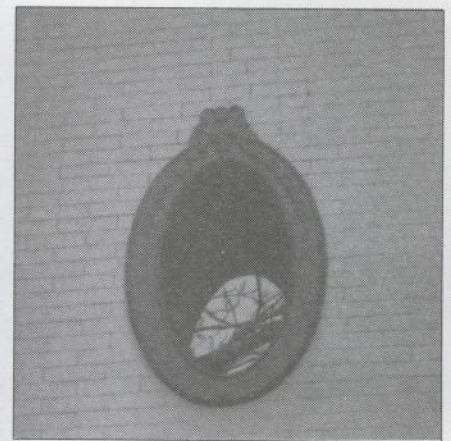


*Far Left* This window, at 116 6th Street, N.E., with its jack arch (forming a flat head) and 8/1 sash is typical of early 20th century Capitol Hill buildings influenced by the Georgian Revival styles. Note the more square proportion of this window in contrast to the vertically-attenuated Victorian era windows.

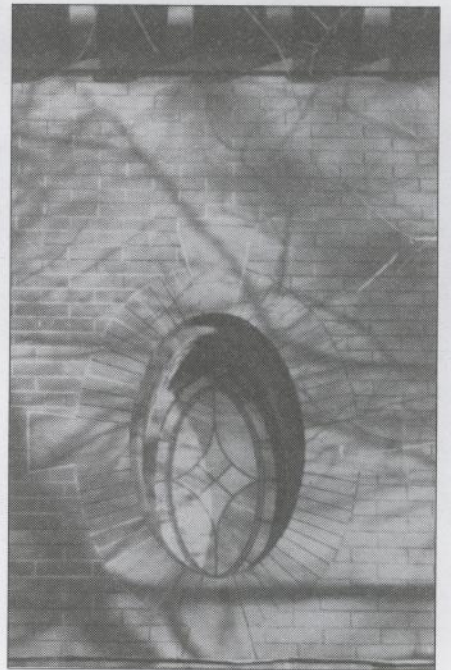
*Center left*, 517 East Capitol & *center right*, 815 Independence Avenue, S.E. Both these window openings are spanned by lintels. The lintel with the 2/2 sash on the left is smooth faced; the lintel on the right is rock faced. The right window is somewhat later than that on the left. Note the vertical proportion and large size of both windows, both of them being nearly eight feet tall.

*Right* A very typical 2/2 sash in segmental arched opening. This window, at 116 7th Street, S.E., has a straight head in an arched opening with the little segment between window head and arch filled in with a piece of wood with an incised design. Other windows in segmental arches on Capitol Hill have curved tops that follow the curve of the arch.

*Top* 1000 North Carolina Avenue, S.E. has an unusual oval window, the characteristic Queen Anne windows with small squares of colored glass around a central light in the upper sash, and stained glass transoms



*An oval window, left, at 32 Eighth Street, N.E.*



*Opalescent glass in this oval window at 100 12th Street, S.E., right, enlivens it from the outside during daylight hours.*

front houses. These windows match the rest of the house in character.

**Material.** All Capitol Hill's windows were wood until well into the 20th century when some steel casement windows appeared. These windows, while original on some buildings, are replacement windows on others and should be reversed. Steel casements are so rare on Capitol Hill, they won't be discussed further here. For information on historic steel casements, see Preservation Brief #13, referenced at the end of this article.

Beside window sash and frame, other components include sills, lintels, glass, and decorative hoods.

**Sills.** Exterior window sills on Capitol Hill's historic buildings are brick, stone, or wood. Sometimes a

house may have stone sills on the front, brick on the rear; brick on the front and wood on the rear; or wood or brick throughout.

Water often penetrates in old houses just below the window. This can be caused by inadequate slope to the sill, which should direct rain water away from the window. Rotten wood sills will not shed water at all. Another way moisture penetrates at windows is through joints between the sills and their surrounding brick or stone.

Frequently, the window sill is a critical element of the overall design of the facade, especially when it is incorporated in horizontal banding.

**Lintels.** Heads of windows are spanned by masonry arches (usually brick) in many forms or by flat lintels of stone. Elaborate arches or stone lintels are

usually on the front, with windows in doglegs and back elevations typically spanned by very simple segmental brick arches. Wood buildings have wood lintels, often not expressed at all on the exterior, being structural elements within the wall.

Just as window sills are frequently incorporated in the exterior design detailing, so too are lintels and arches embellished and/or incorporated in banding and belt coursing.

**Glass.** The Victorian's love affair with large pieces of glass helped shape building fashion in subtle ways. Another aspect of glass in our historic windows is that it is often historic, too. Considering the fragility of glass, an astonishing amount of distinctive 19th century glass is still in place in its historic window sash. Glass-making technology today produces





*Top* Dormer windows appear on older Capitol Hill buildings but are characteristic of early 20th century porch front houses like these.

*Bottom* These modest alley dwellings in Gessford Court typify Capitol Hill's alley dwellings. Hard on the alley, a step or two above grade, they have economical multipane 6/6 windows.

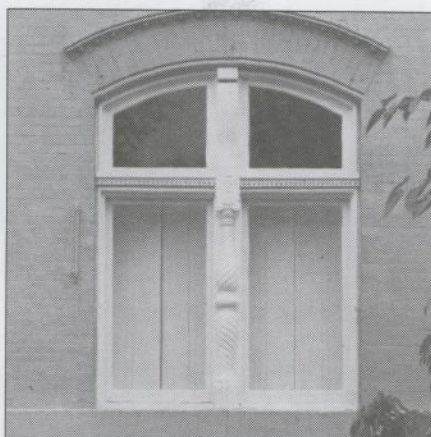
These paired windows illustrate the richness and diversity found in windows on Capitol Hill.

*Bottom right* At 634 East Capitol Street, a floral stained glass transom is in an elliptical arch over two one-over-one windows separated by a turned post.

*Top right* at 636 East Capitol Street, large open sash areas are separated by the turned post.

much more uniform and perfect glass than that of a hundred years ago. Old glass tends to have ripples, sometimes air bubbles, and sometimes subtle color that modern glass doesn't have. The texture, appearance, and translucency of old glass is yet another argument for preserving historic windows. Even if modern windows reproduce muntin and sash profiles precisely, they are unlikely to have glass with the special quality of old glass. In fact, modern glass is so smooth that it frequently looks opaque (completely reflective) from a raking angle. A walk down your block will confirm the difference between old and new glass.

**Decorative Hoods.** One of the characteristics of the Italian or bracketed styles, widely represented on Capitol Hill, are the hoods, or eyebrows, deco-



rating the tops of windows. These hoods range in elaboration from simple raised brick arches above the window arches with vertical drops on either side, to elaborate cast iron or simpler pressed metal hoods. Because the metal hoods were substitutes for expensive carved stone, they were generally painted to resemble stone and so may not immediately strike one as being cast iron or pressed metal.

Because of ferrous metal's susceptibility to rust, it is essential that it be painted regularly. The result of sporadic maintenance is sometimes seen in a row of houses where some of the iron hoods have lost some of their ornament.

**Arch Types.** The arch is the common spanning strategy in Capitol Hill's masonry. Thus, many window openings are spanned by arches, at least in the outer layer (wythe) of brick. Segmental, so named because they are composed of a segment of a circle, are the most common type of arch found on Capitol Hill. The semicircular arch, strongly associated with the Richardsonian Romanesque style, is also found on other styles of buildings. More complicated elliptical and three-centered arches are not uncommon. Some windows follow the curve of the masonry arch; others have a filler arc or a transom between a square sash top and the masonry.

## WINDOW REPLACEMENT DON'TS

*Don't imitate the wrong historical period*



*Don't use a lot of muntins to divide what should be large expanses of glass.*



*Don't reduce the original window opening size.*



*Don't replace windows to get better thermal performance: do install storm windows.*



*If you must replace windows, don't use artificial materials not originally found on the house like steel, vinyl, or aluminum.*



*On the left are original windows appropriate to the house while the replacement windows on the right are too delicate. Note also how the sandblasting of the house on the right has damaged the brick. Sand blasting is prohibited in the Historic District.*





*The original semi-circular openings and wooden sash have been replaced in this building with shortened, square-headed openings and steel sash. The shortened openings make one wonder if ten foot ceilings have been reduced to meager eight foot heights. Note the idiosyncratic square windows above the inappropriate replacement doors.*

**Opening Size.** The size of the typical Capitol Hill window opening is a key, but sometimes under-recognized, aspect of architectural character. A window sill two feet above the floor, with a ten-foot ceiling can easily result in a six-foot tall window. Even modest Late Victorian-era houses had relatively high ceilings. High ceilings and tall windows create a vertical proportion both in the window opening and the narrow row house facade.

Issues of size and proportion are particularly relevant when considering window or fenestration patterns on new construction or rear additions.

**Decorative windows.** While the majority of Capitol Hill's windows are double-hung, a number of exceptions contribute to the richness of the building fabric. These exceptions include basement/cellar windows, occasional very large fixed glass windows, casement and single hung windows, and the rare oval or circular window.

**Basement and cellar windows.** Because nearly all of Capitol Hill's residential buildings are raised a few steps to nearly a full story above grade with basements or cellars, most Capitol Hill houses have basement windows. Basement windows are often very small in-swinging casements or top-hinged sash. In the case of English basements (basement space at least half out of the ground) windows are frequently double-hung with shallow window wells.

## BASIC RECOMMENDATIONS

Because windows are so significant to the architectural character of buildings (apart from practical considerations of light, ventilation, and view), they are addressed by the Standards for Rehabilitation of the Secretary of the Department of the Interior. (The complete Standards are available from the D.C. Historic Preservation Office (202) 727-7360.) Standards number 2, 3, and 6 are particularly applicable to windows:

"2. The distinguishing original qualities or character of a building, (or) structure, ... shall not be destroyed. The removal or alteration of any historic material or distinctive architectural features should be avoided ..."

Thus, replacement of windows should be avoided whenever possible.

"3. All buildings, structures, and sites shall be recognized as products of their own time. Alterations that have no historical basis and which seek to create an earlier appearance shall be discouraged."

This standard discourages replacement windows suggesting a different period or style such as six-over-six and multipaned sash on buildings that should have one-over-one or two-over-two sash.

"6. Deteriorated architectural features shall be repaired rather than replaced, whenever possible. In the event replacement is necessary, the new material should match the material being replaced in composition, design, color, texture, and other visual qualities. Repair or replacement of missing architectural features should be based on accurate duplications of features, substantiated by historic, physical, or pictorial evidence rather than on conjectural designs or the availability of different architectural elements from other buildings or structures."

Replacement windows should match other original windows on the building or a similar building. If the original windows had divided lights, the replacements should also have true divided lights.

The above standards also establish why fixed, tinted, casement, and six-over-six or other small paned sash windows on Victorian-era houses are generally not appropriate. They emphasize good maintenance and repair as preferable to replacement; that "replace in kind" is the rule when replacement is unavoidable; and that replacement with no historical precedent should be avoided.

**Maintenance and Repair** Routine maintenance for most windows on Capitol Hill is largely protecting them from the deteriorating effects of water by

keeping them well painted and sealed. Paint manufacturers usually consider their materials good for five to ten years depending on a number of factors, including: the conditions under which applied (ideally out of direct sunlight, in moderate temperatures); the adequacy of preparation of the substrate; the amount of pigment (darker colors have more pigment, tending to dilute the paint base that actually creates the protective film); and the exposure (southern exposures are much harder on paint than other exposures).

Capitol Hill homeowners should be conservative about their painting schedules, and figure on repainting every four to five years, for at least three reasons. First, the dark colors the Victorians favored (and which should therefore be favored by current owners in the interests of historical accuracy) tend to weather and fail somewhat faster than lighter colors. Second, most windows on Capitol Hill have not received ideal maintenance over the years, and finally, hundred-year-old wood of our windows is often not an ideal paint substrate. Because of the greater expense for labor than materials, it is a good idea to invest in the best paint you can.

When you paint windows, replace any broken or cracked panes; examine and replace glazing putty if necessary; inspect and replace sealant between window frames and masonry if necessary; and inspect, repair, and repaint sills if they are wood and if necessary. As long as window painting is going on, it is a good time to remove paint from painted stone window sills and lintels.

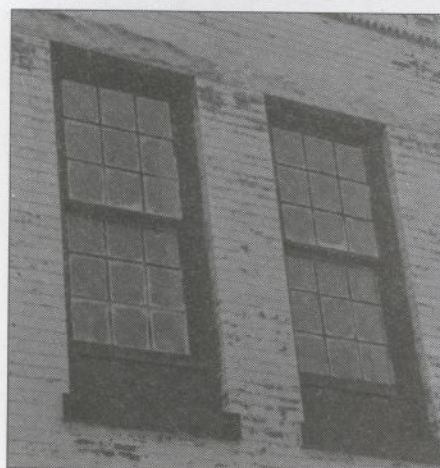
Many Capitol Hill houses have wood window sills: a weak link in the defense against moisture at the window. All horizontal surfaces of buildings are vulnerable to moisture, wood surfaces doubly so. Because brick masonry is subject to moisture migration through capillary action, wood sills embedded in brick are subject to contact with moisture, in turn causing rot. Because window sills in general, and wood sills in particular, are frequent sources of moisture in walls, particular attention should be paid both to the condition of sills and their joints with surrounding materials.

Sash weights and pulleys should also be maintained. The ropes supporting the weights concealed in the window frame frequently break so you may not even realize your windows are counterweighted. Often these ropes are replaced with chains.

Likewise, window hardware should be cleaned, adjusted, and replaced when missing. Excellent reproduction hardware is available in catalogs referenced at the end of this article.

See Preservation Brief #9 on the repair of historic wood windows.





## UNFORTUNATE LESSONS FROM THE PAST: WHAT NOT TO DO.

**The wrong windows for the house.** If you look around Capitol Hill, you can see virtually every mismatch of replacement window and building. At some point, the idea that "old" was the same as "Colonial" resulted in a plague of delicate six-over-six multipaned windows installed to replace aging one-over-one or two-over-two windows. This introduced an incompatible Colonial air to robustly styled late 19th century buildings. The stylistic clash is as jarring as a bold paisley tie with a checked shirt.

The 20th century interest in small-paned windows is ironic when contrasted with the Victorian delight in showing off the industrial expertise that produced larger pieces of glass more economically than ever before in history. Some contemporary homeowners have reversed the large areas of unobstructed glass the Victorians were so proud of: multiple muntins combined with security iron can make over half of the potential glass area solid.

Multipaned steel casement windows and windows of artificial materials such as aluminum and vinyl are equally inappropriate to our building stock.

When window replacement is absolutely unavoidable, it is essential to match the style and type of new windows with the style of the house.

**The incredible shrinking opening.** When people replaced historic windows in the past, if the stock catalog window did not fit the brick opening, the



*Above Here is a candidate for replacement: note the lower sash is missing altogether; the upper sash is from another window; the frames on the windows just below the balcony, victims of leaks from the balcony roof, are pulled away from the masonry, collapsing inward. Note the zig-zag motif in the balcony rail. It is the same ironwork pattern used on security iron on the attached building.*

*Left Multi-paned windows in shrunken openings, shown here, belong on neither of these buildings.*

solution was sometimes to make the opening smaller with wood fillers at the jambs, head, and sill. Tall original windows both looked right in spaces with high ceilings and brought in abundant natural light in otherwise often dim row houses. Installing smaller windows in original large openings not only changes the exterior of the building but also significantly reduces the quality of the interior space and the amount of light.

**Artificial materials.** Now, the vinyl or aluminum replacement window has arrived. The best that can be said about these windows is that they are custom-sized to existing openings. But, they are fraught with other problems, not the least of which is that the D.C. Historic Preservation Office considers them an inappropriate substitute for wood windows. Vinyl and aluminum windows are not acceptable in the Historic District for several reasons, primarily, that they rarely can replicate the character, profile, quality, and overall detailing of genuine wood examples. Look at an installation of them. Study the proportions and profiles of the frame and sash, and the color. Vinyl and aluminum windows are very hard edged and square, unlike the sash and frames of original Victorian-era windows that were softened with various molding profiles. Vinyl or aluminum windows are often white, which is a permanent problem: historically, white was not used for the trim or windows of Victorian-era buildings. Also, if you are replacing your wood windows this year, it means they lasted a hundred years. Do you know how long vinyl will last?

There are no hundred-year-old vinyl windows for reassurance. And, let's say a crack or two develops. Is it repairable? (Lest one feel too protected by guarantees in a relatively new industry; remember, a guarantee is worth little if the installer is bankrupt or has moved on to another business.) We know wood can be scraped, painted, maintained, and repaired to last more or less indefinitely, but we don't know this for vinyl. Finally, vinyl window hardware can be problematic if it becomes brittle in cold weather and snaps.

A desire for thermal upgrading is not normally sufficient reason to replace historic windows. You can reduce infiltration of air at windows with thorough and careful rehabilitation of windows for much less money than replacing them in kind (which is, of course, what you would need to do). (See Preservation Brief #3 for advice on improving window thermal performance.)

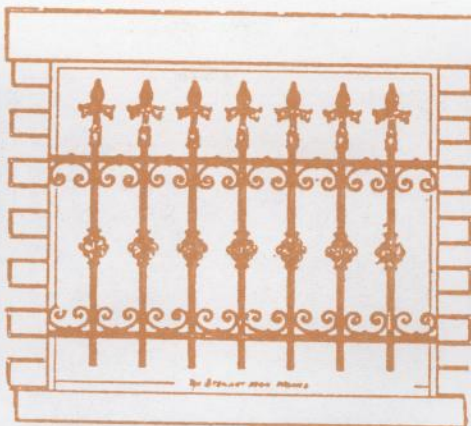
## REPLACEMENT WINDOWS AND NEW CONSTRUCTION

**Replacing Sash Only.** Probably the most common window replacement scenario is when old window sash have deteriorated to the point that joints are coming apart, pieces of sash are missing, and wood members are rotting. Often, deteriorated sash can be found in sound frames. Most of the major window manufacturers make replacement sash so old sash can be removed from the frames and new sash with double glazing installed. This approach is much more economical than replacing an entire window (sash and jamb) to the masonry opening, which also involves disturbing interior and exterior trim.

**Replacing Entire Windows Including Frames.** If you purchase a derelict building with sash that is missing or deteriorated to the point of falling apart, or if you have a building with inappropriate windows and you want to replace them with appropriate ones, you may have to buy new windows from the masonry opening out, both sash and jamb. (A note about inappropriate replacement windows: people have been replacing windows on Capitol Hill houses for decades. It is not always obvious whether windows are original. The major giveaway is inappropriate muntin patterns with the vast majority of inappropriate replacement windows having more panes than the original. Consult the Historic Preservation Office staff if you are not sure your windows are original.)

People used to shrink masonry openings to get stock catalog replacement windows to fit. Since the designation of Capitol Hill as a Historic District in 1976, reducing masonry openings is unacceptable. The possible exception is the occasional case of a rear kitchen window where people sometimes raise





the sill to meet the kitchen counter. Even so, please maintain the original sill and arch in place as a record and to guide restoration should a future owner wish to restore the original. If you are replacing windows that were inappropriate modifications, you need to identify the windows your house originally had. Since many of our row houses have identical or nearly identical neighbors, this is often easily done. Even if a house doesn't have identical neighbors, many Capitol Hill houses have mates elsewhere on the Hill. It is generally possible at least to identify original masonry openings.

The challenge of replacing windows is further complicated by double pane or insulating glass. If you are going to the considerable expense and inconvenience of replacing windows, it is foolish not to take complete advantage of the opportunity to have them as air tight, energy conserving, and comfort enhancing as possible. Using insulating glass reduces the heat lost through windows by half.

So, today, if you have a number of masonry openings of different sizes you are faced with a complicated problem. Basically, you have two choices: buy all custom windows or buy as many stock windows as you can to fit your openings and custom windows for the rest.

There are, however, custom wood window companies who specialize in the replacement market and can make windows appropriate for the Historic District: double-hung, two-over-two, one-over-one, six-over-one, circle topped, and arched window

*Left Both these buildings have historically accurate replacement windows of proper size and configuration for their styles. Note the flat lintels at both window heads, rock faced stone in one case.*

*Bottom One of these houses has replacement windows. Good replacement windows should be indistinguishable from original windows except under closest examination.*

*Top Right New iron work such as this at 627 A Street, N.E. can be just as quirky and charming as historical ironwork while still providing security.*

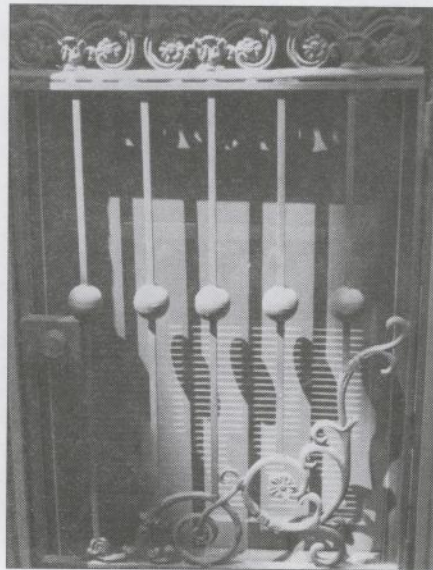
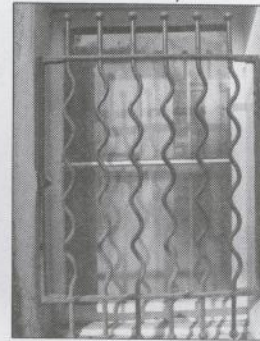
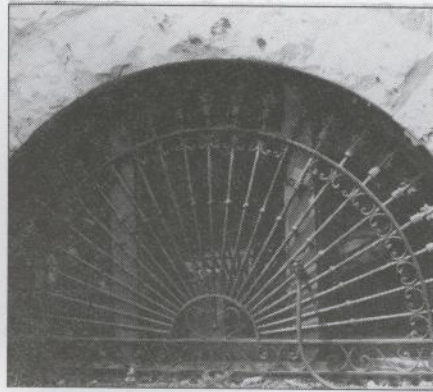
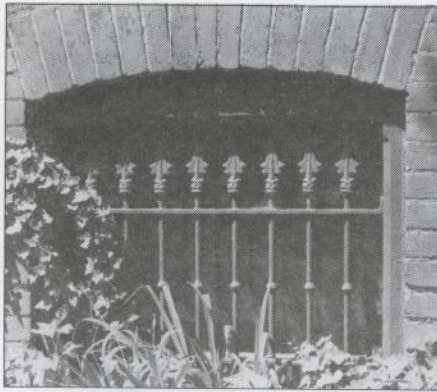
heads. These same companies can make or provide custom brick molds (the piece of molding around the window that makes the transition between the window and the masonry) or true divided lights in insulating glass (opposed to snap-in muntins) or make the other kinds of provisions so the windows look right for the neighborhood.

All the major wood window companies (Pella, Andersen, Marvin, etc.) will make custom window sizes using their stock profiles. You can then use a combination of stock windows that fit openings precisely and custom windows for the openings you cannot find a window to fit. The cost of good wood custom windows is generally not that great relative to the stock lines although circle- and arched-head windows are quite expensive. With sophisticated window systems from these major manufacturers, (the profiles of the frames and sash are extraordinarily complex, helping to ensure both smooth easy operation and water- and weather-tightness), high-performance, low maintenance fin-

ishes are available. The disadvantage of these finishes is often a limited range of color. Remember, white windows are only appropriate for Colonial Revival houses. Dark colors are most appropriate for Victorian-era buildings.

**New Construction and Additions.** In new construction or additions, the design can incorporate stock catalog sizes of wood windows. But, be careful about proportion. "Proportion" can mean many things, but in this case it refers both to verticality and sheer size found in Capitol Hill's windows. When expressed arithmetically, you rarely see a Capitol Hill window that is more squat than about 1:2.5, width to height. While the proportion of any new window is key, equally critical to the overall appearance is the size of the window. A window that is vertical in proportion but too small in size compromises the relationship of opening to solid wall on a building. The typical, late Victorian window is not only vertically attenuated, but is a large





*Top Left* Note the fence style of this basement window grille in a segmental arched opening, with a flat head window. (814 A Street, SE.) *Top Center* Fence vocabulary was also used on this stunning semi-circular grille at 131 11th Street, S.E.

*Top Right* The zig-zag motif on this security grille is also found on the balcony railing on this building's companion at 420 10th Street, S.E. Note that the Victorians too recognized the need to be able to wash windows, providing this grille with lock and hinges.

*Center* 810 A Street, S.E. has a security grille custom fabricated from stock foundry castings. Note that lock and hinges allow both window cleaning and emergency egress.

*Left* A zig-zag motif, found here on a new grille at 404 A Street, S.E., is not uncommon on the Hill.

window, sometimes over six feet in height.

When building new, look to your immediate neighbors (assuming they are buildings of the styles and period establishing Capitol Hill's significance, known to professionals as "contributing buildings") to create fenestration patterns that reflect the pattern of your block. Windows in new construction should be of similar materials (wood), type, size, proportion, and articulation as windows found on neighboring buildings.

Casement windows are not common in the Historic District, although they can be found. Because of their rarity, they are usually not acceptable on the fronts of buildings, although they may be acceptable on rear additions.

Large sheets of fixed glass are also discouraged. Not only are the expanses of glass and absence of window articulation not right for historic buildings, but losing operable windows and the opportunities for ventilation they provide is really unfortunate. Tinted glass is totally inappropriate since it was not

used historically.

**What's Available from the Manufacturers.** The typical, vertically divided two-over-two double-hung wood window of the Historic District is not commonly available as a standard manufactured item, but is increasingly available as a custom item. Window manufacturers' lines of historically accurate wood windows improve every year, so it is important to study your options carefully. True divided light windows have, of necessity, robust muntins, appropriate to a 2/2 window found on an Italian building. Pella's more economical "Architect" series looks like true divided lights, but isn't. Since the muntins are not actually used for glazing they are lighter in cross section: appropriate for a Georgian Revival building such as the porch front style, but not for Capitol Hill's Queen Anne and Italian buildings.

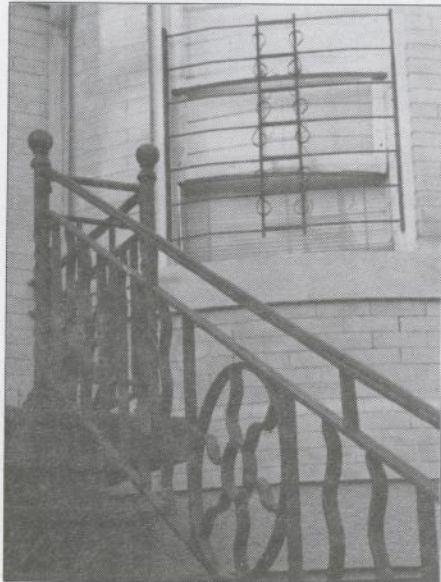
Many modern window systems have snap-in systems that apply a muntin grid to the interior, exteri-

or, or between the panes of insulated glass. None of these snap-in systems look remotely the same as true divided lights and they should be avoided.

The one-over-one window common to the Historic District is readily available from almost all manufacturers of wood double-hung windows. Even though two-over-two and one-over-one double-hung windows are ubiquitous, there is a great range of other window types, sizes, and proportions found in the Capitol Hill Historic District, all contributing to the richness of the building fabric. A missing or seriously deteriorated odd window should be replaced with the same. New construction may employ interesting windows, but they should both be appropriate to the Victorian period, and should be used in ways not inconsistent with what the Victorians might have done.

Additional issues to investigate when buying replacement windows include screens and hardware. There have been cases of custom wood windows on which neither standard hardware nor screens would





fit. Before signing a contract for new windows, be sure you know what the hardware will be like and that you can get screens for them. Some manufacturers of quality wood windows typically install their screens on the exterior. This obscures the historically accurate, and expensive, windows behind. You should insist on interior screens or half screens.

A final reiteration: complete replacement of historic windows should only be a last resort. It is much more expensive than alternatives of maintenance and repair, and is very damaging to the openings, especially to old woodwork. Finally, we must remember that once historic building material, like original windows, is gone, it is gone forever.

## SKYLIGHTS

Another window form found in Capitol Hill's row houses is the skylight typically found above the stairs and sometimes found above the second-floor bathroom. Some of the original wire glass can still be found on the Hill. Save it where you can, as it is increasingly rare. New skylights are appropriate as long as they are not visible from public space.

## SECURITY IRON

Carefully selected replacement windows or good maintenance and repair of old wood windows can be obscured by ill-considered security iron.

We can find precedents in the 19th century building stock of Capitol Hill for many of the additions we want to make to our houses, including

security grilles. If you look around the neighborhood, you can often see basement windows with original security grilles. In some cases, the iron work is reminiscent of patterns and motifs found on iron hair-pin fences. In other cases, there is a coordinated approach to ornamental and security iron on a building with similar motifs used for grilles and balcony rails.

Today's run-of-the-mill security grills seems a debased thing from what it was a hundred years ago. Many people put up security grilles in a panic after a burglary.

## RECOMMENDATIONS

**Maintenance and Repair.** If you are fortunate enough to have original security iron, it should be maintained along with all the other components of the house. Iron work, of course, has some special characteristics and needs.

Because the most obvious threat to any ferrous metal is rust (technically, corrosion, when iron or steel oxidizes through a chemical reaction of oxygen combining with iron to form ferric or ferrous oxides, all in the presence of moisture and air), it is important to keep iron work well painted. Once iron work shows signs of rust you have two choices: remove the rust back to bare metal by sanding or abrading (such as using a wire brush) or use a rust converter to turn the iron oxide (rust) into iron phosphates or complex organo metallic compounds, all of which are stable and form a good undercoating for repainting. Rust converters have the great advantage of brushing on and, as liquids, being able

*Far left This extremely inappropriate security grille looks even more out-of-place in contrast to the distinctive iron stair rail, an original feature of the house.*

*Center Here we can see how unnecessary curlicues detract by competing with the Italian style window and door detail.*

to find their ways into cracks and joints where rust may be. (There are two categories of these rust converters: one is orthophosphoric acid-based and the other is tannic acid-based. Try to avoid the ones that contain resins as those are more expensive, have shorter shelf lives, and don't allow re-coating.) Inquire at your local hardware or paint store for these products.

When historic components rust away, replace them in kind. This may be as simple as inserting bars or rods or as complex as replicating decorative elements and soldering or welding them on. A good ironworker/welder is quite capable of this kind of restoration work.

**New.** Security iron represents a significant investment that will have a substantial impact on the appearance of your house, window washing, and your view of the world. Security iron hastily obtained can make your house look like a jail and make window washing impossible.

In addition to considering how planned security iron will look and how it will be mounted, think about emergency egress and window washing. In spite of the additional expense, it is a good idea to get security grilles hinged with dead bolt locks, keyed on both sides to allow easy opening for window washing or emergency.





*Interior historic shutters as seen from the exterior, above and the interior, left inserts, both open and closed.*

*Right center* This house in Philadelphia Row has both shutters and historic shutter dogs to secure them in the open position.



*Above* An example of a wood storm window hinged at the top for ventilation and access.

**Sources.** There are three basic options for the appearance of security iron: something already made and available, a custom design using stock parts, or a custom design using all original fabrication.

The commonly available security grilles are probably the least expensive and the least historic looking. These grilles are often of the jail look with a curlicue to soften the reality. At the very least, when choosing the most available grilles, please avoid the curlicues and buy simple, undecorated grilles. Also, round bars are more prevalent in the community on fences and original security grilles so they are preferable. Finally, consider whether the grille must cover every inch of the window or whether it could start four inches up from the sill and stop a few inches short of the top. Reducing the overall size of the grille by eight inches is a significant improvement in looks and is just as secure.

Another possibility to consider is running the vertical bars through the top cross piece (just as the pickets on our iron fences extend above the horizontal piece). This lightens up the top of the grille.

If you have a little more time to select your security grille, The Stewart Iron Works Company (listed at the end of this article), has a marvelously appropriate line of window grilles.

Using stock casting pieces can be more economical than getting a completely custom grille. Two

foundry companies that make stock castings are listed at end of this piece. In making selections, consider existing historic grilles in the Historic District.

## ACCESSORIES

**Shutters: Interior and exterior.** Many 19th century buildings on Capitol Hill had window shutters, inside or out. Prior to mechanical cooling and efficient heating, shutters were important thermal strategies for excluding summer sun and providing an additional barrier to cold air, besides increasing privacy, reducing fabric fading and distraction while dining.

When restoring, be guided by physical evidence. If the window configuration precludes shutters, as happens on many of our building fronts where windows are too big or close together to permit shutters, it is a mistake to apply them. Many houses have acquired square top shutters nailed to walls next to arched windows or a single shutter mounted on one side each of a pair of closely spaced windows. This kind of false decoration degrades the architectural integrity of our houses. On the other hand, shutter hinges (or pintels) can often be found on window openings on the rear or dogleg portions of houses, suggesting original or early shutters. Here it would be appropriate to install operable shutters, sizing them to fit the entire window opening precisely.

It is generally obvious when windows originally had interior shutters as they were integral to the window trim at the sides of the window. On Capitol Hill, interior shutters are most commonly seen on the slightly grander corner houses and are

generally solid wood shutters with an operable louvered section in the center.

**Awnings.** Canvas awnings were popular in the late 19th century and were widely used for sun shading on both residential and office buildings. Canvas awnings are historic, aluminum isn't! And, these canvas awnings were taken down in the winter. Also, historic awnings were for sun shading, so they were not used on the north sides of buildings. Residential awnings should be a dark color and should just fit the size of the window.

The common practice of using awnings on commercial buildings for signs is a different issue and is not addressed here.

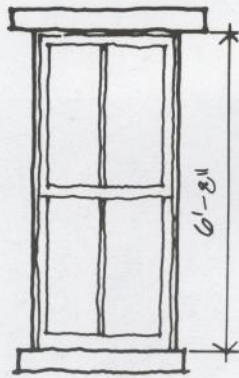
**Storm windows.** Aluminum triple-track storm windows were not the first storm windows. Historically, many Capitol Hill row houses had wood framed storm windows, put up and taken down seasonally. Some lucky homeowners have even found old storm sash in basements and carriage houses.

While there is no historic precedent for triple-track aluminum storm windows, they are the solution recommended by the National Park Service for thermal upgrading of historic buildings. Aluminum storm windows have the advantages of preserving original windows and protecting them from deterioration by the elements. Further, they are reversible and can be painted to be relatively inconspicuous.

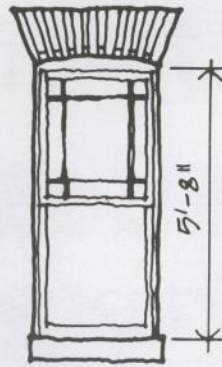
Some homeowners have installed wood storm windows that are hinged at the top and swing out at the bottom. This allows for egress, ventilation, and window cleaning. ☼



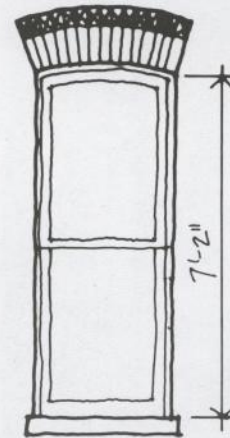
## WINDOW STUDIES



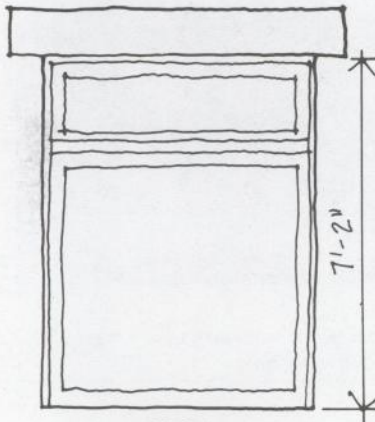
1863



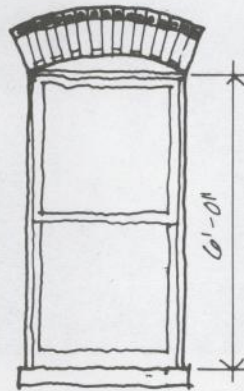
1887



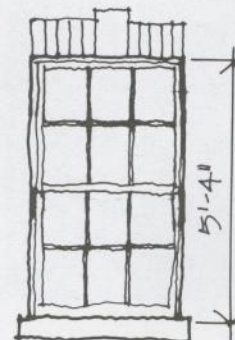
1890



1891



1893



1932

### ADDITIONAL INFORMATION

The *Capitol Hill Historic District Design Guidelines*, published by the Capitol Hill Restoration Society, available from the Society, have several related articles:

Schauer, Lyle. "The Stained Glass Windows of Capitol Hill".  
Capen, Judith. "Building Styles in the Capitol Hill Historic District." to identify the style of your building and appropriate window types for it.  
"Unpainted Ladies" for window colors.  
"Entrances" for discussion of transoms at front doors.

#### Catalogs for security iron:

Fairmont Foundry Company, Inc. Birmingham, Alabama. (205) 841-6472 or 1-800-821-2501.

Lawler Machine & Foundry Co., Inc.  
(Warehouse and Ornamental Sales)  
Birmingham, Alabama. (205) 595-0596.

The Stewart Iron Works Company,  
Covington, Kentucky. (606) 431-1985.

#### Catalogs for window hardware:

The Antique Hardware Store.  
Kintnersville, Pennsylvania 1-800-422-9982.  
The Renovators Supply.  
Miller Falls, Massachusetts. (413) 659-2211.

The *Preservation Briefs* (U.S. Department of the Interior, National Park Service, Preservation Assistance Division, Technical Preservation Services) available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 and from the D.C. Historic Preservation Office

(202) 727-7360, are good sources of information.

Smith, Baird M. "Conserving Energy in Historic Buildings." Brief #3.

Myers, John H. "The Repair of Historic Wooden Windows." Brief #9.

Weeks, Kay D. and Look, David W. "Exterior Paint Problems on Historic Woodwork." Brief #10.

Park, Sharon C. "The Repair and Thermal Upgrading of Historic Steel Windows." Brief #13.

Weeks, Kay D. "New Exterior Additions to Historic Buildings: Preservation Concerns." Brief #14.

Park, Sharon C. "The Use of Substitute Materials on Historic Building Exteriors." Brief #16.

Nelson, Lee H. "Architectural Character: Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving Their Character." Brief #17.

See also "The Window Handbook: Successful Strategies for Rehabilitating Windows in Historic Buildings" joint publication of the National Park Service and Center for Architectural Conservation. Available from the Center for Architectural Conservation, Georgia Institute of Technology, P.O. Box 93402, Atlanta, Georgia 30377. Publication includes Park Service Tech Note #3 on Exterior Storm Windows.

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