



## Carson City Planning Division

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### MEMORANDUM

Historic Resource Commission of March 14, 2019

**TO:** Planning Commission **Item E-5**

**FROM:** Hope Sullivan, AICP  
Planning Manager

**DATE:** March 7, 2019

**SUBJECT:** **HRC-18-114** – To consider potential modifications to Section 5.16 of the Development Standards regarding guidelines for windows in the Historic District.

At its meeting in September 2018, the Historic Resources Commission (HRC) decided to pursue clarifications to the Design Guidelines relative to windows, similar to the work done on fences. The goal was to better articulate the expectations in the district for the benefit of property owners.

Individual members of the Commission have started drafting new language for the consideration of the Commission. That new language is not in a final form, but is provided for the purposes of discussion to verify and clarify the expectations of the Commission.

Currently, Section 5.16 of the Design Guidelines addresses windows as follows.

#### **5.16 - Guidelines for windows.**

*The majority of buildings in the Historic District are characterized by 19 century styles of architecture. A basic design characteristic of these styles is symmetrically placed, vertically proportioned windows. Houses built in the 1930s to 1960s used in addition to the above, metal framed windows such as casements and picture windows.*

**5.16.1 Guidelines for Historic Buildings.** *Original windows shall be retained and repaired when at all possible. When replacement is necessary a window of duplicated design shall be used. The size, pane configuration, design and trim shall replicate that of the original. Original trim and surrounds are to be retained when windows are replaced. Bronzed aluminum framed windows are not appropriate for use in a historic building. Stained glass windows were not commonly used in the buildings of the district. Original stained glass windows are very valuable and should be retained. The addition of stained glass windows into openings which did not historically have stained glass is discouraged. (Standard Number: 2, 6)*

*Graphics of windows not shown*

**5.16.2 Guidelines for New Construction.** *The overall style of the new building will determine the appropriate design characteristics of the windows to be used. Windows for new buildings emulating 19th or early 20th century designs should emulate one of the 19th or early 20th*

*century window styles and shall be vertically proportioned with a minimum ratio of 2 horizontal to 3 vertical and shall be single or double hung. Windows for new buildings emulating mid-20th century designs should use windows found in designs of those era (c. 1930-1960). The use of smoked, mirrored or tinted glass is not appropriate for use in the district.*

*(Ord. 2005-23 § 1 (part), 2005: Ord. 2001-23, Development Standards).*

The guidelines reference standards 2 and 6 of the Secretary of the Interior Standards for rehabilitation. These standards state the following.

**5.13 - Secretary of interior standards for rehabilitation.**

*Rehabilitation is defined as the process of returning a property to a state of utility, through repair or alteration, which makes possible an efficient contemporary use while preserving those portions and features of the property which are significant to its historic, architectural and cultural values.*

*The standards for rehabilitation are as follows:*

*2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.*

*6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.*

Attachment

Revised window language with a window matrix

## Revised Windows – Carson City Historic Resources Commission (~~2-19-2019~~) (3-1-2019)

There are 270 buildings in the Carson City National Register District that were constructed before 1900 and thus will have wooden windows. The vast majority, 67% of resources in the CC district will have wooden windows, which is why it is so critical that property owners know how valuable the original windows are and how to repair and preserve this important character-defining element of the building.

Replacing an original window in a historic building should be the very last choice. Most historic wood frame windows can be taken apart and the deteriorated pieces fabricated and the window put back together. Newer windows cannot be taken apart and have a use life of about 30 years. Whereas the historic windows are usually 100 or more years old!

Considerations for repair or replacement of windows.

Windows are a character-defining feature of most historic buildings. The size, configuration of panes, sash, and material and reflect the time period and styles that were popular at that moment in history. In most cases the windows were carefully chosen when the building was constructed to match the style.

After 120 years in a house, the wooden windows can look worn, rattle loose in their frames, feel drafty, stick or not close tightly. Window panes might be broken, sashes and sills may be rotten, and putty may be falling out. Is it time to just replace them?

Let's take a closer look at the windows – wooden windows can be refurbished: wood repaired, stripped and repainted, clean putty applied to keep windows from rattling, new glass if broken, weatherstripped, and the mechanisms repaired so that windows open and close smoothly. The repaired window is weather tight and efficient – and will last another 100 years! Most replacement units are only good for about 20 years. Replacing windows is expensive and wasteful, because most modern windows are just thrown in the dump. Wood windows can be repaired endlessly.

The following questions and table provide some steps to clarify the decision-making process.

### Questions

- 1) Are the windows the front or primary side of the building?\*
- 2) Are the windows original to the building? All or some? – Document how many are original.
- 3) Are the windows unique or good examples of craftsmanship or design?
- 4) If not original, were they replaced to match the original?

\*The front or primary side of the building is the most important for maintaining the original materials, design, and windows. Secondary elevations such as the sides or rear of the building are

less visible and there is more latitude for repairs and replacements. However, on each side of the building the window treatment should be consistent.

Decision Tree: Why do you want to replace a window? Have you considered repairing the window? (see window condition matrix)

Window 1 – Located on the façade, is original, a wooden double-hung, six over six sash with one pane broken. The window is missing a sash weight, so it doesn't operate smoothly, is painted shut, and has some deterioration of the exterior sash. All of the items can be repaired. Replacing missing pane and removing paint are fairly easy repairs to make. Replacing or repairing the sash weights is a bit of a challenge but there are some good guides on how to do this. Once the sash weight is replaced the window may need to have weather stripping or guides to allow it to move smoothly.



Windows with their functional and decorative features are important to the overall historic character of the building. The window material (wood, steel, aluminum) and how the window operates (e.g., double hung, casement, awning, or hopper) are significant, as are its components (including sash, muntins, ogee lugs, glazing, pane configuration, sills, mullions, casings, or brick molds) and related features, such as shutters.

There are 270 buildings in the Carson City National Register District that were constructed before 1900 and thus will have wooden windows. The vast majority, 67% of resources in the CC district will have wooden windows, which is why it is so critical that property owners know how valuable the original windows are and how to repair and preserve this important character-defining element of the building.

After about 1850, with the advent of mass-produced millwork, standard profiles and sizes of windows were established with a wide variety of designs and glazing configurations that could be purchased from catalogues.

Steel was employed beginning at the end of the 19th century to build fire-resistant windows in tight urban environments. Rolled steel was also used for double-hung windows, which were common in high-rise buildings in the 1920s and beyond. Aluminum windows were developed in the 1930s and, by the 1970s, rivaled wood in popularity, particularly in commercial and institutional buildings. They were produced in a variety of styles and functionality, including casement, hopper, awning, and double-hung sash.

Metal-clad (initially copper) wood windows appeared early in the 20th century but were not common until the later part of the century, when enameled aluminum cladding replaced copper. Although used primarily as replacements in older buildings, vinyl windows were developed in the latter part of the 20th century and marketed as inexpensive and thermally efficient. Modern windows are also made of fiberglass and polymer-based composites.

Storm windows were used historically and are still used to help regulate interior temperatures. Limited commercial use of thermal-pane or insulated glass in windows began in the 1930s, but it was not readily available until about 1950. Tempered glass also came into use about this time. Since then, work has continued to improve its efficiency and to reduce the effect of ultra-violet rays with tinted and low-e (low emissivity) glass.

The majority of buildings in the Historic District are characterized by 19 century styles of architecture. A basic design characteristic of these styles is symmetrically placed, vertically proportioned double hung windows. Houses built in the 1930s to 1960s used, in addition to the above, metal framed windows such as casements and picture windows.

**New Section:** After 120 years in a house, the wooden windows can look worn, rattle loose in their frames, feel drafty, stick or not close tightly. Window panes might be broken, sashes and sills may be rotten, and putty may be falling out. Is it time to just replace them?

However, wooden windows can be refurbished. Wood windows can be taken apart and deteriorated components fabricated and the window put back together. Sometimes a window just needs to have the paint removed, clean putty applied to keep windows from rattling, new glass if broken, weatherstripped, and the mechanisms repaired so that windows open and close smoothly. The repaired window is weather tight and efficient – and will last another 100 years! Most replacement units are only good for about 20 years. Replacing windows is expensive and

wasteful, because most modern windows are just thrown in the dump. Wood windows can be repaired endlessly.

The following questions and table provide some steps to clarify the decision-making process.

### Questions

- 1) Are the windows the front or primary side of the building?\*
- 2) Are the windows original to the building? All or some? – Document how many are original.
- 3) Are the windows unique or good examples of craftsmanship or design?
- 4) If not original, were they replaced to match the original?

\*The front or primary side of the building is the most important for maintaining the original materials, design, and windows. Secondary elevations such as the sides or rear of the building are less visible and there is more latitude for repairs and replacements. However, on each side of the building the window treatment should be consistent.

Why do you want to replace a window? Have you considered repairing the window? (see window condition matrix)

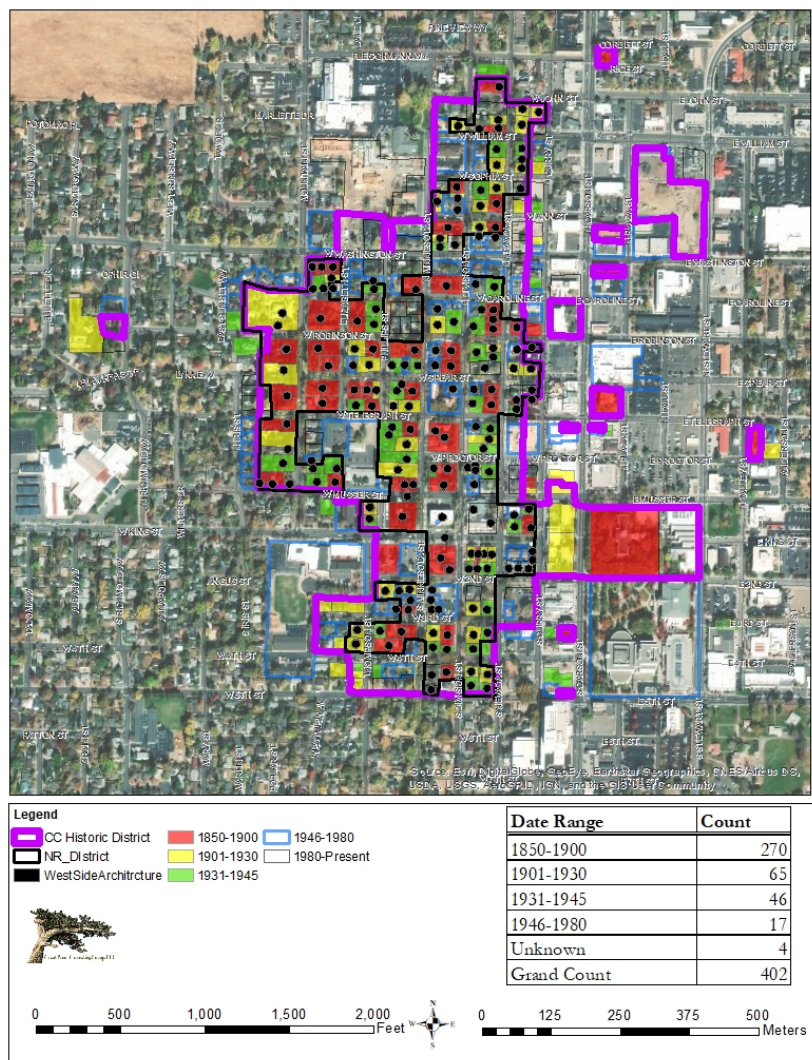
**5.16.1 Guidelines for Historic Buildings.** *Original windows shall be retained and repaired when at all possible. Since 90% plus of all historic windows can be repaired cost effectively, replacement should be the very last resort and based on proof the windows cannot be repaired. Insert window assessment. When replacement is necessary a window of duplicated design shall be used. The size, pane configuration, design, trim and shadowlines produced by the sash and muntins shall replicate that of the original. Original trim and surrounds are to be retained when windows are replaced. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.*

*Bronzed aluminum framed windows unless substantiated by documentary or pictorial evidence are not appropriate for use in a historic building. Stained glass windows were not commonly used in the buildings of the district. Original stained glass windows are very valuable and should be retained. The addition of stained glass windows into openings which did not historically have stained glass is discouraged. (Standard Number: 2, 6)*

Windows with their functional and decorative features are important to the overall historic character of the building. The window material and how the window operates (e.g., double hung, casement, awning, or hopper) are significant, as are its components (including sash, muntins, ogee lugs, glazing, pane configuration, sills, mullions, casings, or brick molds) and related features, such as shutters.

Typically, windows are formally and symmetrically arranged on the front facades of buildings. Windows located on side or rear facades are often informally arranged for more functional purposes. It is important to identify, retain, and preserve windows--and their functional and decorative features--that are important in defining the overall historic character of the building.

After about 1850, with the advent of mass-produced millwork, standard profiles and sizes of windows were established with a wide variety of designs and glazing configurations that could be purchased from catalogues. Wooden framed windows occur between 1850 and 1890 in the Carson City Historic District



Approximate Construction Dates of Buildings within the Carson City Historic District

Steel was employed beginning at the end of the 19th century to build fire-resistant windows in tight urban environments. Rolled steel was also used for double-hung windows, which were common in high-rise buildings in the 1920s and beyond. Within the Carson City Historic District wooden frame and steel window were likely on buildings constructed between 1891 and 1930.

Aluminum windows were developed in the 1930s and, by the 1970s, rivaled wood in popularity, particularly in commercial and institutional buildings. They were produced in a variety of styles and functionality, including casement, hopper, awning, and double-hung sash. Aluminum windows may appear in the Carson City Historic District on buildings dating between 1931 and 1945.

Metal-clad (initially copper) wood windows appeared early in the 20th century but were not common until the later part of the century, when enameled aluminum cladding replaced copper. Although used primarily as replacements in older buildings, vinyl windows were developed in the latter part of the 20th century and marketed as inexpensive and thermally efficient. Modern windows are also made of fiberglass and polymer-based composites. Modern windows likely appear in the Carson City Historic District after 1946.

Storm windows were used historically and are still used to help regulate interior temperatures. Limited commercial use of thermal-pane or insulated glass in windows began in the 1930s, but it was not readily available until about 1950. Tempered glass also came into use about this time. Since then, work has continued to improve its efficiency and to reduce the effect of ultra-violet rays with tinted and low-e (low emissivity) glass.

~~The majority of buildings in the Historic District are characterized by 19th century styles of architecture. A basic design characteristic of these styles is symmetrically placed, vertically proportioned double hung windows. Houses built in the 1930s to 1960s used, in addition to the above, metal framed windows such as casements and picture windows.~~

## **Historic Windows - Repair or Replace**

After 120 years in a house, the wooden windows can look worn, rattle loose in their frames, feel drafty, stick or not close tightly. Window panes might be broken, sashes and sills may be rotten, and putty may be falling out. wooden windows can be refurbished: wood repaired, stripped and repainted, clean putty applied to keep windows from rattling, new glass if broken, weatherstripped, and the mechanisms repaired so that windows open and close smoothly.

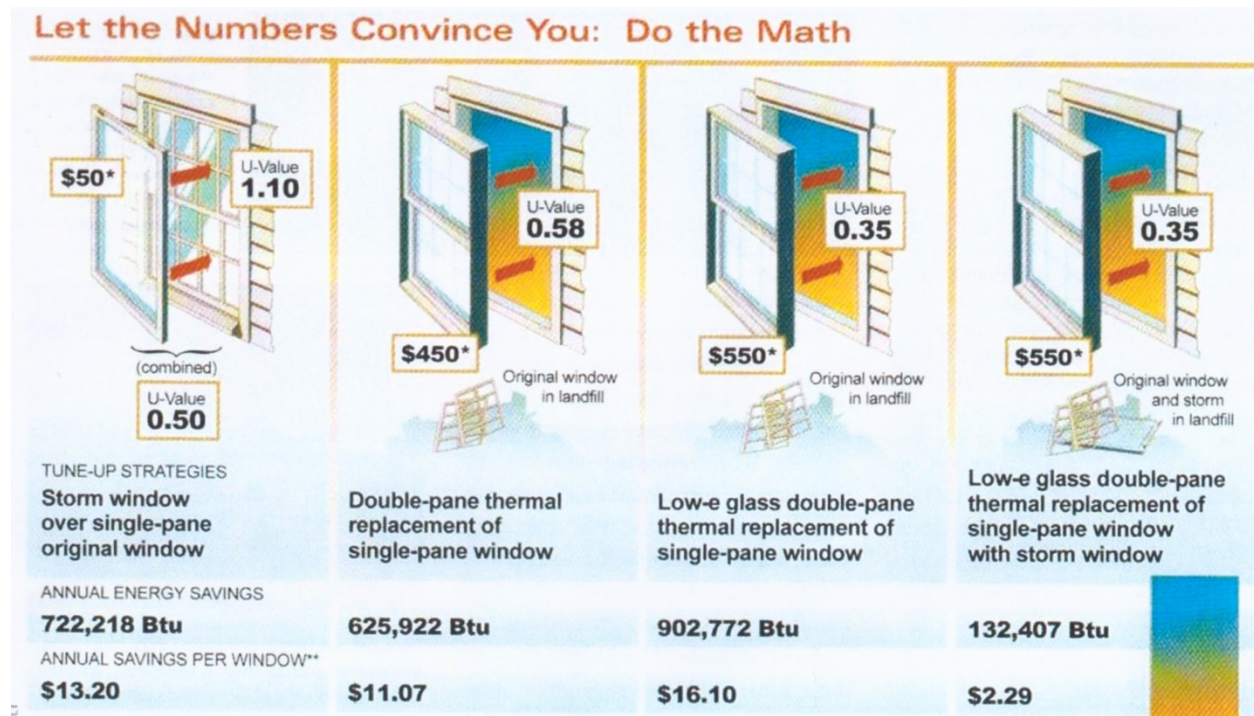
Replacing windows is expensive and wasteful, because most modern windows are just thrown in the dump. Even if windows are deteriorated, it can often be cheaper to reglaze, caulk, weather-strip or scrape and paint the old windows, which are made of old-growth wood, a denser, longer-lasting material than wood harvested today. The repaired window is weather tight and efficient – and will last another 100 years! Most replacement units are only good for about 20 years

## **Energy Efficiency**

Windows do more than let in light and air. Replacing windows in pursuit of better energy efficiency, convenience and lower maintenance is not recommended. Similar to all components of historic buildings, windows need regular maintenance to extend their useful life. Even if windows are deteriorated, it can often be cheaper to

reglaze, caulk, weather-strip or scrape and paint the old windows, which are made of old-growth wood, a denser, longer-lasting material than wood harvested today.

The addition of a storm window can protect a home's historic windows and extend their life for decades. Properly maintained historic wood windows with weather-stripping and storm windows can improve their energy efficiency and are comparable to the energy efficiency of many new windows (see chart below).



Before windows can be replaced in a building in the historic district, the existing condition of each window should be documented. The Carson City Historic Resource Commission offers advice and helpful literature that can guide homeowners to the best choice for their historic home. HRC has prepared Window Consideration Guidelines and Matrix to assist with identifying the extent of deterioration in each window and to provide a decision base as to whether the windows should be repaired or replaced. Building owners are urged to replace windows or window parts as needed with windows that match the style, size and materials of the originals.

### A preservation-friendly approach

Try to repair what you have. Investigate the historic windows to determine the problems and their causes. Only after weighing the aesthetic, performance, energy efficiency, cost and long-term durability aspects of proposed work can an informed decision be made whether to repair or replace windows.

If you cannot feasibly repair it, replace it with the same thing. Consider the impact of the new windows on the appearance of the building. Replacement windows should match the historic windows in their materials, operation and design.

If you cannot replace it with the same thing, replace it with something that is similar in appearance. Wood windows are offered with aluminum or vinyl cladding on the exterior, which helps reduce the maintenance.

True divided light windows are the preferred choice for replacement windows. Simulated divided light windows, where the grilles are permanently applied to the exterior of the glass, may be substituted for historic wood muntins. Avoid flat grilles placed between window panes or only on the interior, because they poorl

The following questions and table provide some steps to clarify the decision-making process.

### Questions

- 1) Are the windows original to the building? All or some? – Document how many are original.
- 2) Are the windows examples of unique or exceptional craftsmanship or design?
- 3) If not original, were they replaced to match the original?
- 4) Is the frame deteriorated on the exterior only?
- 5) Is the frame also deteriorated on the interior?
- 6) Do the windows operate?
- 7) Can they be made operable by paint removal, re-glazing, weather-stripping, caulking, and repainting

The National Park Service utilizes a four level classification system to document and assess the existing condition of historic windows. Preservation Brief #9, *The Repair of Historic Wooden Windows*.

**Class One (I):** Routine Maintenance is associated with small repairs that are usually performed as part of a building's annual maintenance program. This may include paint removal, re-glazing, weather-stripping, caulking, and repainting.

**Class Two (II):** Stabilization shows a small degree of physical deterioration but can be repaired in place by patching, waterproofing, consolidating, and re-gluing the existing material.

**Class Three (III):** Partial Replacement has localized deterioration in specific areas. These members are totally removed and new ones are spliced into the existing fabric.

**Class Four (IV):** Total Replacement is called for when the entire fabric of the window has deteriorated and the only feasible alternative is total replacement.

Total replacement calls for accurately replicating the historic appearance of the existing windows. The replacement sash should match the historic sash in pane size and configuration, glazing, muntin detailing and profile, and historic color and trim. Particular attention should be paid to the change in relief that would affect the character of the historic window and alters the overall appearance of the entire building.

**5.16.1 Guidelines for Historic Buildings.** *Original windows shall be retained and repaired when at all possible. Since 90% plus of all historic windows can be repaired cost effectively, replacement should be the very last resort and based on proof the windows cannot be repaired. (See Denver Window Application). When replacement is necessary a window of duplicated design shall be used. The size, pane configuration, design, trim and shadowlines produced by the sash and muntins shall replicate that of the original. Original trim and surrounds are to be retained when windows are replaced. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.*

*Bronzed aluminum framed windows unless substantiated by documentary or pictorial evidence are not appropriate for use in a historic building. Stained glass windows were not commonly used in the buildings of the district. Original stained glass windows are very valuable and should be retained. The addition of stained glass windows into openings which did not historically have stained glass is discouraged. (Standard Number: 2, 6)*