



STANDARDS AND GUIDELINES FOR SUSTAINABILITY

INTRODUCTION

Design and construction of historic structures maximized the use of natural resources such as light and ventilation. This chapter will explore old and new techniques to assist you in maintaining your home and provide additional energy efficient options. These techniques and options will allow your home to operate efficiently while maintaining its character defining features.



MAINTAINING WOOD WINDOWS

STORM DOORS AND WINDOWS

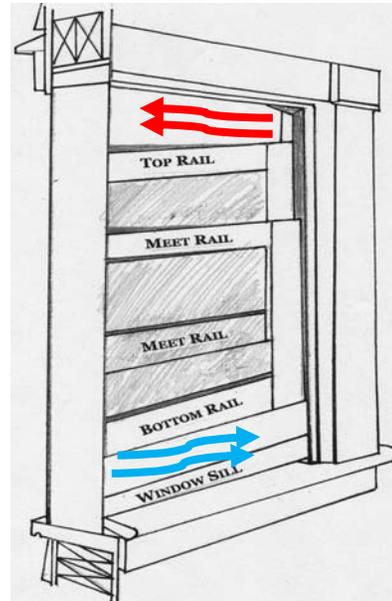
SHUTTERS

SCREEN DOORS AND WINDOWS

AWNINGS

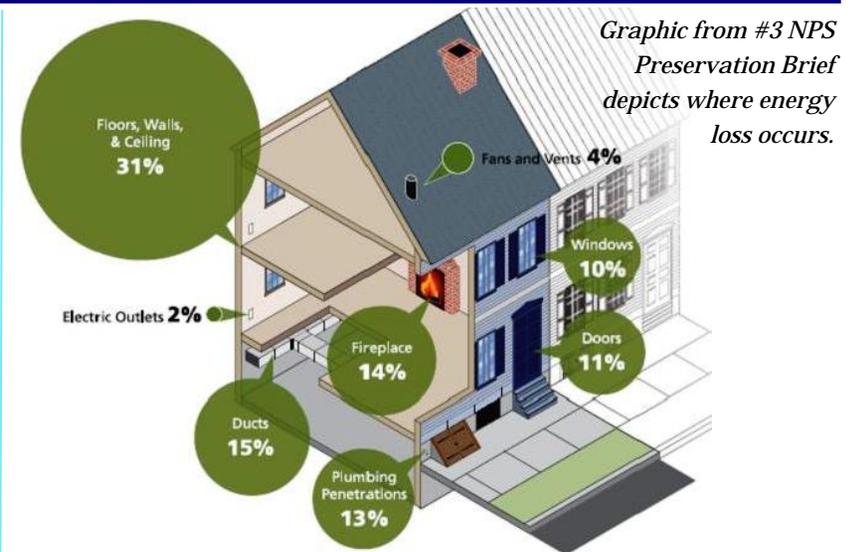
COOL ROOFS

SOLAR TECHNOLOGY



WOOD WINDOWS—MAINTENANCE AND EFFICIENCY

The US Department Of Energy estimates that windows account for roughly 10% of a structure's air loss. Three basic steps can be taken to reduce the amount of air loss through the window unit; maintenance and the installation of low-e film and storm windows.



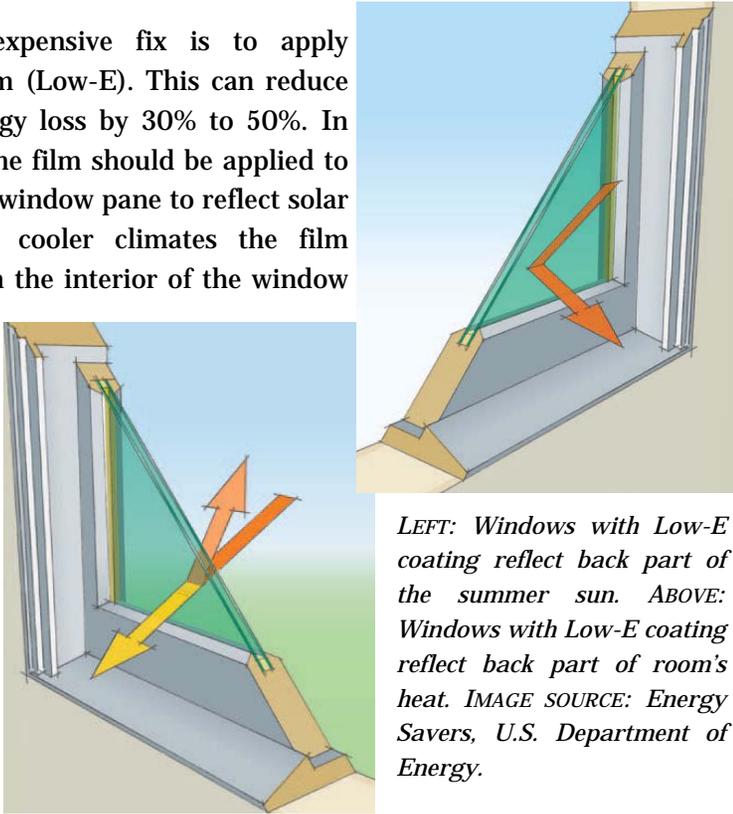
MAINTENANCE, WEATHER STRIPPING AND CAULKING

Maintaining windows on a regular basis to ensure that they operate properly will significantly reduce the amount of air loss. This includes replacing rotten wood, painting, and adding weather stripping and caulk. Weather stripping should be used between the movable parts of a window. It can easily become ripped, torn, loose, bent or otherwise damaged so follow the manufactures instructions for installation and routinely inspect and replace if needed. Caulk and other sealants can be used on the exterior of your building where different materials meet or where expansion and constriction occur.

REMINDER: All exterior work requiring a building permit requires a Certificate of Appropriateness and must conform with all of City of Fort Worth ordinances. It is helpful when using these guidelines to be familiar with your architectural style.

LOW-E FILM

A quick and inexpensive fix is to apply Low-emissivity film (Low-E). This can reduce your window energy loss by 30% to 50%. In warmer climates the film should be applied to the exterior of the window pane to reflect solar radiation out. In cooler climates the film should be placed on the interior of the window pane. So heat is reflected back into the house. The film can be purchased at your local hardware store and has a lifespan of approximately 10-15 years.



LEFT: Windows with Low-E coating reflect back part of the summer sun. ABOVE: Windows with Low-E coating reflect back part of room's heat. IMAGE SOURCE: Energy Savers, U.S. Department of Energy.

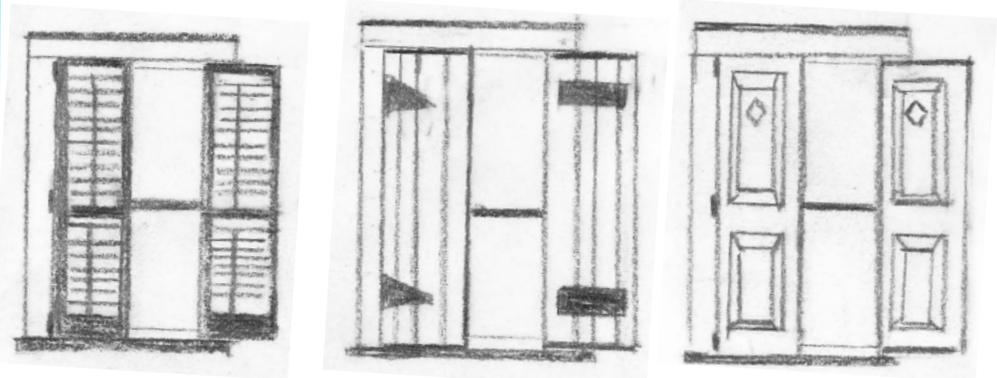
STORM WINDOWS AND DOORS

Storm windows can be installed either on the interior or exterior of the structure to increase the thermal performance of your window. The addition of a storm window to a single pane window will have an energy rating close to that of a double pane replacement unit. Storm windows avoid the irreplaceable seal failure on insulated glass units (IGUs). The typical life span of an IGU is approximately 25 years. Storm windows can also be purchased with a Low-E coating. Storm windows and doors should not be installed in locations where they damage or conceal significant features and should fit the opening.



SHUTTERS

Historic windows are recessed within the wall of the structure. This allows for either a shutter or a screen to sit within the frame of the window unit. When the shutter is closed it creates a flush condition that provides protection from storms and intruders. Exterior shutters, historically have been used to provide privacy and security while controlling light and air circulation. For this reason, **all shutters shall be operational (hinged)**. The style of shutter is dependent upon the architectural style and not all styles can accommodate shutters. Styles that cannot accommodate shutters can accommodate wood screens and awnings on the exterior and blinds on the interior.



A. LOUVERED

B. BOARD AND BATTEN

C. PANELED

- A. LOUVERED: Provide the most control for light and air circulation. They can be closed and locked, with the louvers open. This provides protection from rain and security while allowing light and air in. Louvered shutters are appropriate for all style of homes.
- B. BOARD AND BATTEN: Are vertical boards, usually beaded tongue and groove, fastened by horizontal battens. They provide security, but do not allow for the control of air circulation and light. They are appropriate for Arts and Crafts style structures, with or without a decorative cutout and Tudor style structures. They are NOT appropriate for Victorian style structure.
- C. PANELED: These shutters have panels and don't afford much control of air circulation or light infiltration. They are appropriate for Arts and Craft style structures, with a decorative cutout, and for ground floor commercial Victorian style structures, without a decorative cutout.

SCREENS FOR DOORS AND WINDOWS



Screening became popular in the 1880s and remained popular throughout the United States. It fell out of favor as air conditioning became affordable. During the beginning of the 20th century it was so popular that a 1930 survey from *The Journal of Home Economics* ranked window screening as the third most important “household appliance” behind running water and sewage disposal. Screen doors can be simple in design or can match the style of the main structure. Paired and ribbon windows will not accommodate shutters; however, wood screens can be installed to help control light and air circulation. Screens also provide some protection from rain and sun. Screens can be combined with shutters. Structures that have shutters located on the exterior will have screens located on the interior; while, windows that can not accommodate shutters will often have screens on the exterior with blinds on the interior.

SOLAR SCREEN



Solar screening is more opaque than traditional screening. This allows for more privacy while still allowing for air circulation. It will reduce the amount of light infiltration, by reflecting the sun's rays and because of its thickness it will help to trap heat in the winter months. The reflection of the sun ray's will also extend the life of your window unit.

AWNINGS



For nearly two centuries awnings have helped to define the American streetscape. Awnings first made an appearance in America in the first part of the 19th Century. These awnings were simple and utilitarian in design. After the Civil War awnings became more popular; industrialization made the frame work of awnings affordable. By the later part of the 19th Century operable and roller awnings were common. They allowed for more flexibility in the shading of shops and residences.

Historically their primary use has always been to regulate light infiltration. The US. Department of Energy states that awnings can reduce heat gain by up to 65% in south facing windows and up to 77% in east facing windows. They reduce the stress on air conditioning units and can lower the cost of cooling a building by up to 25%. They reduce glare and heat gain as efficiently as tinted windows and window film. During severe weather they provide protection to the structure while allowing the window or door to remain open, circulating air.

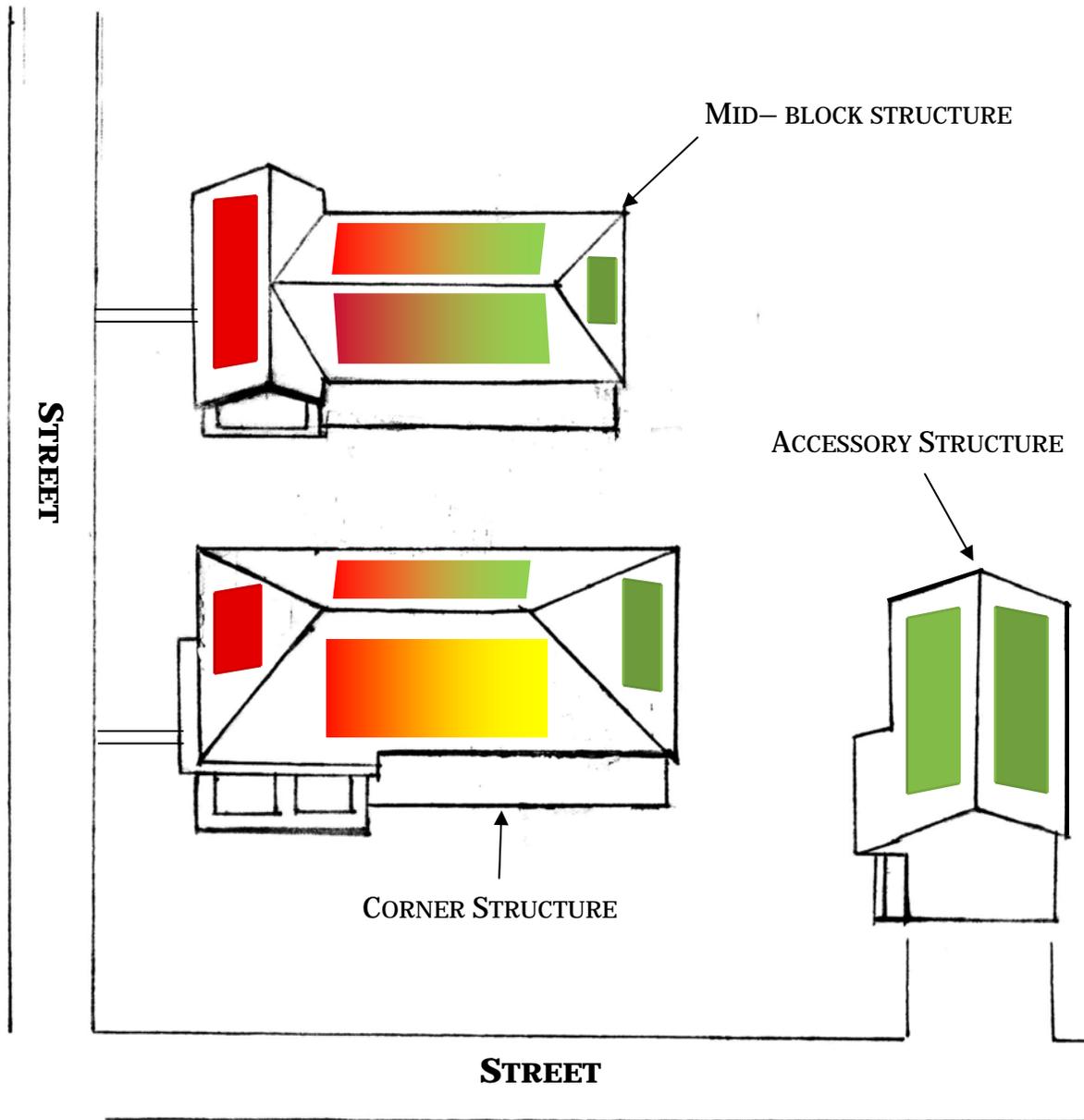


Awnings were typically triangular in shape with a simple metal frame to which dyed canvas was attached. Slate, tan and green were the most popular colors. Sometimes stripes were painted to the top portion of canvas. The color of the stripes typically corresponds to the color of the structure. Shed like awnings



with free hanging valances are appropriate for most structures in the Fairmount Historic District. Awnings should be installed only where needed, typically the south and west elevations of a structure or on selected openings.

SOLAR PANELS



Prior to installing solar technology on-site, try improving the energy efficiency of the structure through other passive methods such as awnings, and screens. When placing solar panels on-site, consider the impact that the technology will have on the historic character and fabric of the site. Consider the following locations prior to requesting the installation of solar technology on historic structures:

1. Pole mounted below the fence line
2. Non-historic structures on the site

If the desired energy efficiency cannot be achieved in the above location then consider the following location:

3. Historic Accessory structures

If the desired energy efficiency cannot be achieved by placing solar technology in the above three areas, and the technology must be place on the historic structure, then the following locations should be considered in the order listed below.

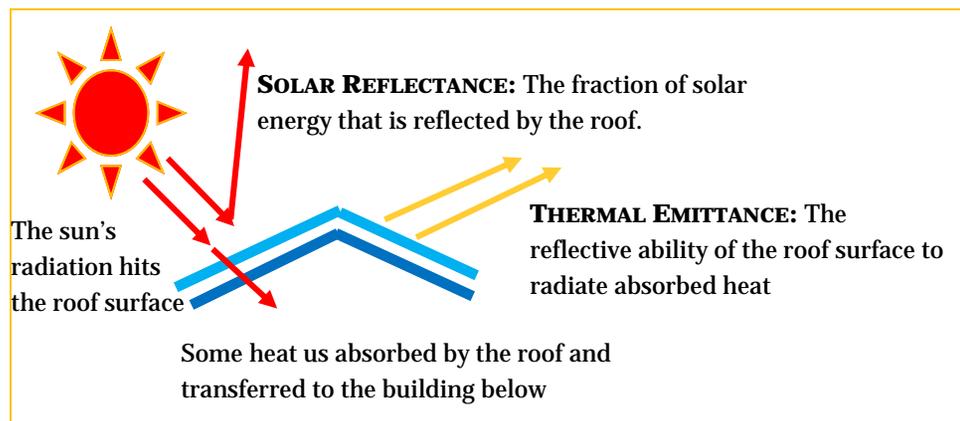
4. Non-visible roof slope
5. Rear roof slope
6. Rear portion of side or secondary roof slope
7. Side or secondary roof slopes
8. Front or primary roof slope

In addition solar panels installed on the main structure should conform to the slope of the roof and not extend past the ridge line or eave line of the roof.

ABOVE: The above illustration shows where the most and lest appropriate locations for solar panels.



COOL ROOFS



Cool roofs reflect and emit the sun's heat back into the sky instead of transferring it to the structure. Their average energy saving range from 7-10%. There are several different types of cool roofs. They range from coatings for metal roofs and flat roofs to reflective granules on asphalt and other synthetic shingles.



ABOVE: Cool Roofs come in three colors in asphalt/fiberglass shingles. They are typically lighter and more reflective than traditional roof shingles.

ADDITIONAL RESOURCES

- NPS Preservation Brief #3 Improving Energy Efficiency in Historic Buildings
- NPS Preservation Brief #9: The Repair of Historic Wooden Windows
- NPS Preservation Brief #44: The Use of Awnings on Historic Buildings: Repair, Replacement and New Design
- The Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines on Sustainability for Rehabilitating Historic Buildings
- Energy Savers, US Department of Energy

SUSTAINABILITY STANDARDS

1. Desired locations of solar panels shall be: pole mounted (not visible above fence line), accessory structures, rear roof slopes and rear portion of side (secondary) roof slopes.
2. Solar panels located on front roof slopes or primary roof slopes shall only be permitted provided that they increase energy production by more than 10%.
3. Solar panels shall conform to the slope of the roof.
4. Solar panels shall not extend above the ridge line of the roof.
5. Shutters shall be operational (hinged) and fit the opening.
6. Shutters on paired or ribbon windows are prohibited.
7. Vinyl and metal shutters are prohibited.
8. Storm doors and windows shall not damage or conceal significant features and shall fit the opening.
9. Screen doors and windows should be made of wood and shall not damage or conceal significant features and shall fit the opening.
10. Metal screens or storm doors and windows shall have a factory painted finish or shall be painted to match the window frame or sash.
11. Metal, corrugated and slatted plastic awnings are prohibited.
12. Fabric awnings with simple metal frames shall be allowed provided that the shape, and size of the awning is compatible with the structure and does not conceal or damage any significant architectural elements. Primary colors of awnings should be slate, tan, green or stripe.