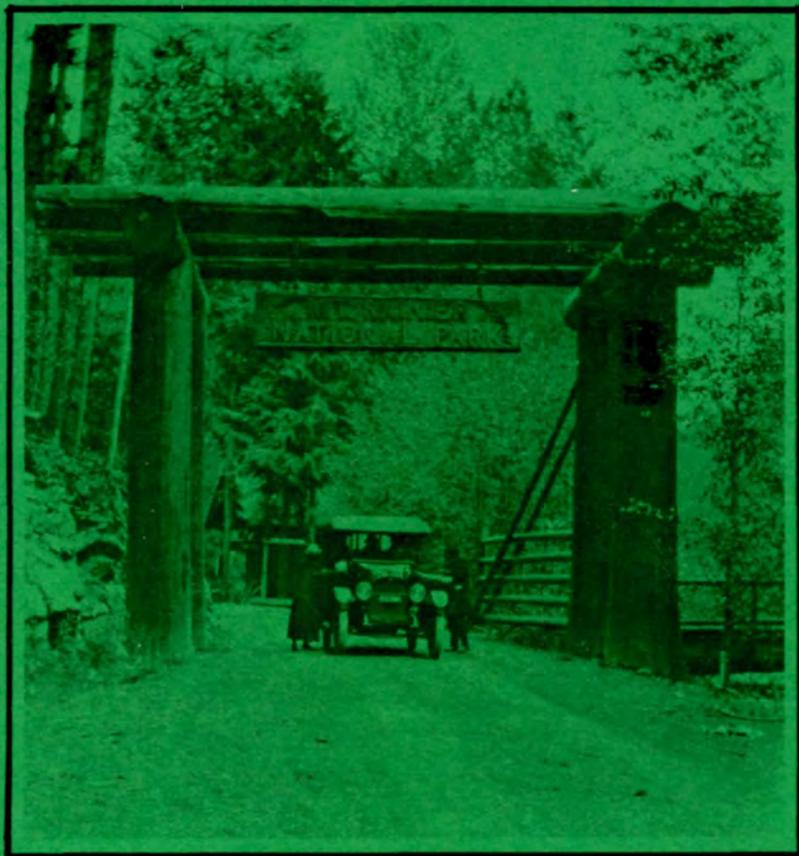


Historic Structures Maintenance Guide



**Historic
Structures
Maintenance
Guide**

For

**Mount Rainier
National Park**

**National Park Service
Pacific Northwest Region
Cultural Resources Division**

Prepared
By



Designed By **Dan O'Neil**

15 April 1983

For
Further
Information

N.P.S.
Pacific Northwest
Regional Office
Cultural Resources Division
Westin Building, Room 1920
2001 Sixth Avenue
Seattle, WA 98121

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Introduction

National Park Service buildings maintenance workers today are facing new demands which were not conceived of a generation ago. The Park Service has always led in the areas of natural and architectural resource conservation in the United States, with the emphasis on conservation and restoration. The building maintenance worker is now expected to not only keep park buildings safe and sound, weathertight, and fit for current uses, but also to become a preservationist, sensitive to historic qualities, knowledgeable about traditional building methods, and able to preserve and restore these landmarks by selecting the most appropriate conservation technology for their many different conditions.

There have been cycles in the attitudes toward commercial and recreational development within the parks, and the related buildings have come and gone. Successive administrations have left their imprints on the parks as the directions changed, with the result that there is a succession of building types and stylistic variety corresponding to those changes. Only recently have national park buildings become recognized as major treasures within the parks equal in importance to the natural wonders. The building represent both a distinctive style of architecture and unique ensembles within the parks, intimately related to the histories of the parks and man's interaction with their wonders.

This guide was commissioned to provide Mount Rainier National Park's building maintenance personnel with background information on the architectural and historic significance of the park's historic landmark buildings. It is an outline of fundamental architectural conservation technology and options available to assist them in doing their work in accordance with professional preservation standards. It is not a detailed cyclical maintenance manual for the buildings or a prescription for preserving and maintaining any specific building. The guide offers a range of current preservation standards and alternative conservation technologies which have been found useful in meeting the problems of buildings in similar conditions. References are suggested for obtaining more detailed instruction on specific technical preservation subjects. A library of these source documents should be made available for the maintenance personnel's consultation when specific questions arise.

The maintenance worker in Mount Rainier National Park is urged to give priority to employing traditional "Well Building" technology in preserving and maintaining the park's historic buildings and to use new miracle technology advisedly. With just a few notable exceptions, there have been no dramatic breakthroughs in architectural conservation technology which have proven more dependable than those sound building technologies which existed when the buildings were first constructed. A measure of skepticism toward newly offered cures for building ills is the historic preservationist's most valuable tool.

The RUSTIC Style

Mount Rainier National Park's buildings conform to what is generally called The Rustic Style of Architecture. The term is used to describe buildings in National Park Service, U.S. Forest Service, and private commercial work and recreation sites. There is no clear point of origin of the style in either of the outdoor services or with any one designer. The Rustic Style was also employed by the railroads and private park concessionaires in the buildings which they constructed in the parks. What is called The Rustic Style appears to be just one variation of the larger Arts and Crafts Style for arts and architecture which began in Europe and rapidly spread to America.

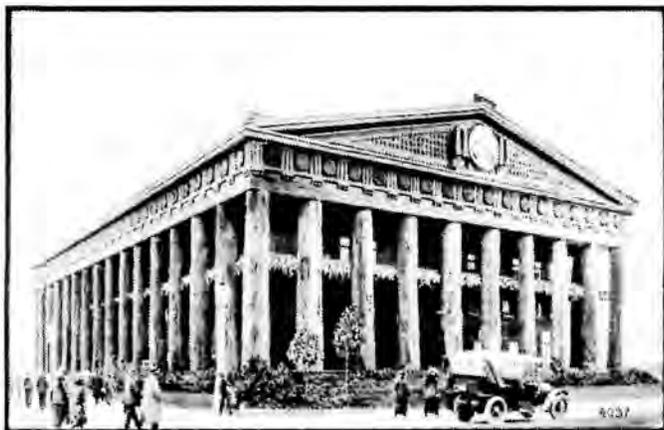
Rustic buildings first appear as playhouses for the wealthy in the eighteenth century. Marie Antoinette played dairymaid in her rustic cottage at Versailles in pre-revolution France. English architect M.H. Bailie Scott built a rustic tree house for Queen Marie of Rumania in 1898 (the same Queen Marie who dedicated Maryhill Castle near Goldendale, Washington). West End Hotel (1879), Bar Harbor, Maine, is one example of the early use of the Rustic Style by architects for resort buildings in New England.



Early Rustic
Hotels

There is a clear developmental path of the Rustic Ideal in life and architecture from the eighteenth century French philosopher, Jean Jacques Rousseau, through nineteenth century English philosopher and moralist John Ruskin and American landscape architect Andrew Jackson Downing, to the Arts and Crafts Movement and Rustic (Rural) ideas of the National Park Movement which reached fruition in the early twentieth century. The Rustic Ideal was an integral part of America's growing years and dominated family and outdoor culture throughout the period 1900 to 1940s. The Rustic Style was seen as being appropriate to the out-of-doors, was "natural", and suggested simplicity to those seeking diversion from their increasingly complicated, industrialized, and commercially directed lives. Giant Rustic Style log cabins were featured exhibit buildings at Portland's 1905 Lewis and Clark Centennial Exposition and San Francisco's 1914 Panama-Pacific Exposition; the "Log Parthenon" was Oregon's exhibit building.

Rustic Fair Building



Variations of The Rustic Style have different names in other parts of the country and might be called Adirondack Style in the lake region of Upper New York and, most recently, Cascadian Style for Timberline Lodge in Oregon. Cyril M. Harris (*Historic Architectural Source Book*, 1977) defines Rustic as, "... Descriptive of rough, hand-dressed building stone, intentionally laid with high relief; used in modest structures of rural character." More generally, the definition should also include the use of heavy hewn timbers and log construction.

Alpine, Nordic, and Chalet Style are names frequently used

along with descriptions of The Rustic Style. A "chalet" is a Swiss herdsman's hut or cottage in the Alps. Alpine and Chalet Style buildings are characterized by their generally low pitched roofs (5:12 and less), were frequently roofed with slate or other flat stones or tiles, and were intended to offer low wind resistance and to retain their snow covering for added insulation, having snow guards and snow retaining stones or blocks on the roof surfaces.

Alpine Chalet



The Nordic Style of building is characterized by its steeply pitched roof (6:12 and steeper) designed to shed its snow covering as rapidly as possible. The Nordic roof is covered with wood shingles and shakes or vertically run board-on-board. While stylistic distinctions between roof pitches and their coverings are not perfect, there is a general respect for the nature of the materials involved and their suitability under different exposure conditions.



A Nordic Church

In addition to incorporating elements of the Chalet or Nordic buildings, Rustic Style buildings typically use heavy rubble stone masonry for foundations, basement or ground story walls, and fireplaces and chimneys. They feature heavy exposed timber framing or log construction with emphasized joinery and projecting ends. Like the Bungalow Style, there is a piling-on of beams-on-beams reminiscent of oriental architecture for porches and eaves. Logs may be barked or with bark left on (a romantic and very poor practice). Some have described Rustic Style as being “Bird House Architecture,” and there is a conscious connection to the romantic sentiments of books like *Wind in the Willows* and the hope that people might enjoy nature like the animals of the woods. Hence, the occasional use of naturally bent tree limbs and forks to make railings, supports, and furnishings in Rustic Style buildings. The original Oscar Brown Cabin, Longmire, was an ideal Rustic Style building.

**Oscar Brown
Cabin (1908)**



The 1899 Congressional Memorial which resulted in the creation of Mt. Rainier National Park included enthusiastic comparisons of Mt. Rainier with Mt. Blanc, St. Elias, Fujiyama, and Mt. Ararat, “. . . like Alps.”

Wherever possible, hand hewn and hand finished work was exhibited in the buildings in their construction and furnishings, from timbers and stonework to lampshades. These characteristics were part and parcel of the corresponding Arts

and Crafts Movement and Bungalow Style architecture of the same period. In many cases, an urban bungalow residence might appear identically “rustic” to a park building, sometimes more so.



**Headquarters
Building**

There are no recorded names of the architects, if any, for the earliest Mt. Rainier National Park buildings. The Longmire family's buildings were typical of the period's rural vernacular buildings, built to meet the immediate needs using the materials fashioned from the site's rocks and trees. The park's early railroad developed buildings were more sophisticated than the Longmires' huts, cabins, and lodge, and were very similar to other railroad stations, inns, and dormitories built throughout the west.

The National Park Service's buildings show a continuous evolution of the Rustic Style from about 1904 through the CCC 1930s. There were a succession of National Park Service Landscape architects and engineers responsible for the designs. Characteristic of the philosophy of the period was Ranger and landscape architect Charles P. Punchard's stated intent to “. . . sanitize Longmire's area to restore its romantic rustic appearance.”

Frederick Heath, Tacoma architect for the 1917 Paradise Inn (coinciding with establishment of NPS in 1916), very typically had never before designed a Rustic Style building, but still planned this most important building. He may have been influenced by other national park and Railroad Rustic architecture. Heath's other buildings exhibit a wide variety of the formal architectural styles used by the leading successful architects in the early twentieth century. Some of his other major buildings in Tacoma are the Puget Sound National Bank Building, Lincoln High School, Knights of Pythias Temple, Board of Education Building, and many residences. Mr. Heath would have seen many Rustic Style buildings illustrated in professional journals and style books published at that time.

Paradise Inn (1917)



The Rustic Ethic survives today, although much Rustic architecture has been superceded by a woosy Modern Style architecture because of changed labor, material, and economic conditions. Also, Rustic Style architecture fell into disfavor among modern architects and designers, both in and out of government service. It was felt to have been too cute and old fashioned. There is no denying its continuing appeal as evidenced by the popularity of log cabin buildings of all kinds for do-it-yourself housing after the Second World War and in the many prefabricated houses and cabins available today for both vacation and permanent residences.

Preserving the Rustic Style



Stacked Timber
Detail

The maintenance and preservation of Rustic Style buildings is a special problem. The Rustic Style's love of massively used stacked and clustered timbers without concern for their weather, rot, and insect protection is inconsistent with building design which facilitates long life and low maintenance. The building's built-in maintenance problems make necessary any *special efforts and methods for their preservation and maintenance* if they are being preserved as landmarks. If these rustic elements are removed, replaced, or improperly maintained, the essential quality of the buildings as historic landmarks is correspondingly reduced. Each increment of change to a historic building made in a manner inconsistent with its original design, adds to those accumulated changes which make it a new building and none of the former landmark, a candidate for either documentation or reconstruction but not preservation. The challenge is to maintain these old limited life expectancy buildings with all their original qualities so that they will endure indefinitely, one hundred years and not just another ten.

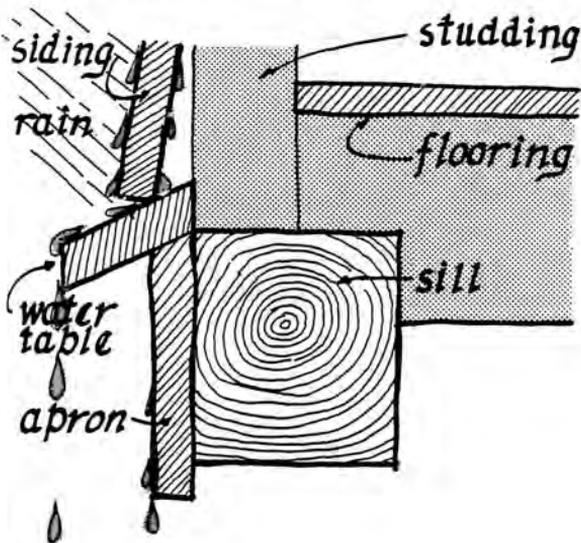
In a true sense, many of the characteristic elements of Rustic Style and its emulation of the picturesque alpine chalet or nordic hut are contrary to the very well thought out details of those Old World buildings which enabled them to survive and continue in use in a similar mountain environment. A brief

Picturesque Details



study of good Scandanavian and Swiss building examples in the United States and of the French-Canadian log buildings in Canada shows that the extremely exposed log ends, projecting beams and rafters, and the unprotected sills and foundation timbers is a *romantic conceit and not representative of permanent traditional log and timber construction methods*, maybe used for temporary out-buildings, but not for the principal house and barn or other permanent buildings. Foundation timbers laid on the ground were always known to be highly subject to rot, and a permanent building always had its sills, floor beams, and joists raised off grade on some kind of foundation, above moisture and insect attack. Measures were always taken to protect the principal structure from weather damage by designing its joints and corners to be resistant to water retention, to minimize the exposure of end grain of wood to the weather, or to provide an outer

Good Protection



protective covering over the main structural material which could be easily maintained or replaced without disturbing the structure.

Where Rustic Style buildings are based on sound building principals and an understanding of traditional "Well Buildings" methods, their preservation and maintenance presents no greater challenge to the trained craftsman than does another building of similar construction in the same environment. Where, however, a Rustic Style building is built employing romantic notions of rural architecture, too often derived from temporary buildings, then the preservation and maintenance of that building presents a challenge to the responsible people, a common challenge with that presented by temporary and vernacular buildings of many types.



Rotten Details

Some Definitions

Before continuing into detailed recommendations for maintaining and preserving the important design characteristics of the Mount Rainier National Park landmark buildings, a few words need to be said about "Significance", "Consistency of Style," and "Appropriateness" or "Authenticity."

Significance

Is the total of the architectural, social, and historic qualities which make the building a historic landmark. Loss or damage to any of those qualities makes the building less of a historic landmark. Ideally, every remaining part of the building is part of its original construction or of an important addition to the building. As much as possible, the present use of the building is the same as it was originally, and it has not been necessary to make improvements to any of the building or to rehabilitate it. Obviously, these ideal conditions do not often exist, and historic landmark buildings must be altered in some ways, improved, rehabilitated, and have their use changed. When the architectural qualities of a historic landmark building have been drastically eroded or altered and only the social and historic qualities remain, the historic landmark building may be said to be gone and only the historic site remains. Whether or not the significance of the site alone is sufficient to be commemorated is a separate consideration from that which recorded the building.

Consistency of Style

Refers to the intent of good architects, builders, and

maintenance people to make changes to old buildings and to impose new buildings among the old ones by either conforming to the principals of the design used for the old buildings or to skillfully adapt the new designs so that they are harmonious with the old. A military-like consistency, such as "Major" Tomlinson's cabin groups at Sunrise may be a bully historical quality of some Rustic Style park buildings, but it is not the same as the consistency aim of preservation maintenance. Just as it would be inconsistent to repaint a part of one of the present brown color buildings with Caterpillar Yellow just because a can of that paint was handy, so it is inconsistent with the Rustic Style buildings to install a 2x4 or pipe railing where the original was heavy timber or natural tree limbs and to use a cheap bullet light fixture with a PAR 40 lamp when there are more suitable and satisfactory fixtures available for installation. It is not always true that aluminum window sash replacements for original wood sash are inconsistent, but bright aluminum and inexpensive horizontal sliders are inconsistent because there are better alternatives available which both maintain the original design appearance qualities and offer fewer maintenance problems with their construction and operation.

Consistency



Authenticity & Appropriateness

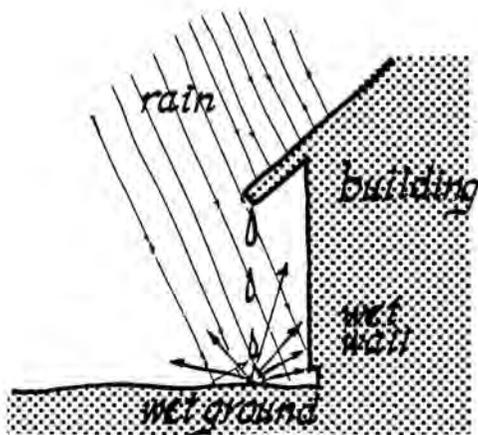
Refer to the relative degree with which replacement or substitute elements of a historic building closely match the original as to material, quality, workmanship, and appearance;

or are found to preserve the original design intent in terms of quality, scale, and appearance when they either are necessary new additions to the historic landmark building or are replacements for a missing or damaged element which is no longer available. The difference between "Authentic" and "Appropriate" and inappropriate new and replacement elements in a historic landmark building is often no more than taking a little more time to consider the alternatives available, seeking qualified advice from design experts, or giving the job a second look and seeing how well the new work truly matches the old.

The following sections give some specific recommendations on particular problems of the Mount Rainier National park historic landmark buildings. Throughout, the problems of Rustic Style buildings, Consistency of Style, Authenticity, and Appropriateness are repeated.

Site and Grounds

Rustic Style buildings are often intentionally built close to the ground to make them appear to be more natural and less of an imposition in the park landscape scene. This close to the ground construction may mean that the foundation sills or timbers are in direct contact with earth, extremely subject to rot, or are otherwise unprotected from ground moisture and from roof run-off splashing. Only temporary rural buildings and outbuildings were normally built so vulnerable to deterioration. Good site planning and maintenance helps to keep ground and rain water away from the building, keeping its materials dry.



Wet Design

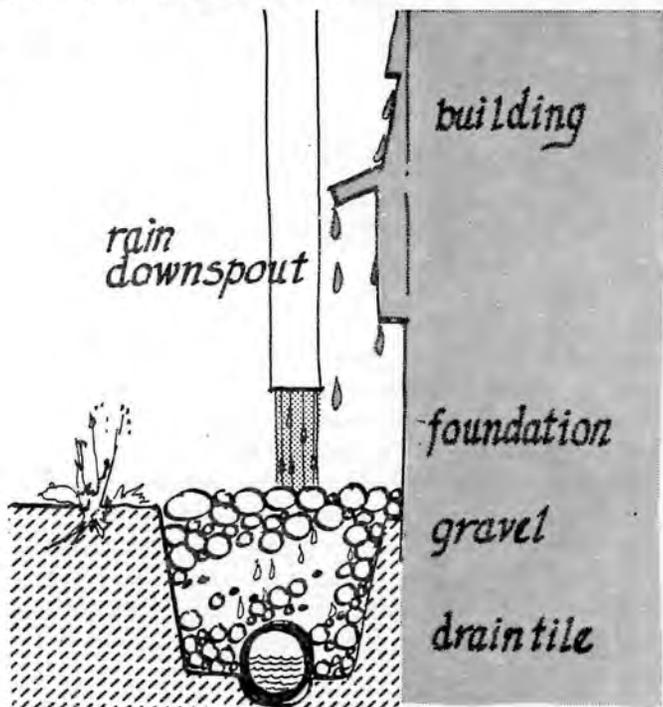
Proper maintenance of the grounds, plantings, and paving adjacent to the park's historic buildings will help to reduce damage to the buildings and consequent maintenance work due to their vulnerable design. Grounds should be maintained or lowered adjacent to the buildings rather than filled so that the foundations and sidings are even wetter. Backfilling against a wood building is sure to promote rot in the siding and framing. Backfilling up against a masonry building wall will raise the water table within that wall, either increasing or creating a moisture problem to the construction above or behind the masonry.

Backfill Problems



Ideally, ground surfaces around a historic building (or any building) should have a minimum four percent slope down away from the building so that any surface water is channeled away to a satisfactory drain or water course. Where eave troughs and downspouts are not used to contain roof water, it is often advisable to install French Drains around the perimeter of the building to receive the run-off and channel it away to a drain course. Where there is a natural watercourse or high water table under a building, the installation of subdrains and ground moisture barriers are recommended to dry the crawl space under the building.

French Drains



Severe cases of moisture damage to a building may require the addition of appropriate eave troughs and downspouts to the historic building and the installation of rain drains to catch the runoff and carry it away, a conflicting problem where snow and ice are considerations.

Plants & Landscaping

The control of natural plants and landscaping materials adjacent to buildings is essential to its maintenance and preservation. Dense and close plantings tend to retain moisture and increase the moisture content of the building materials behind them. More study may indicate that some kinds of plantings can protect a building from weather damage, such as the row of evergreens at the south end of Paradise Inn Annex which appears to shield the wall behind from drifting snow build-up against the wall.

Early Minimum Roads



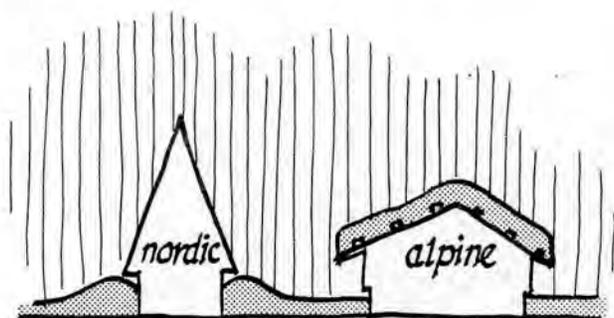
Much of the rustic quality of the park and its buildings has been lost in order to accommodate the growth of seventy years of automobile use. The park and its buildings were oriented to early auto camping culture almost from its inception, but the automobile and its roads and parking areas were a minor part of park scenery for those first thirty years. In addition to the visual intrusion of the present large paved area for automobiles, the impervious asphalt paving compounds surface drainage problems. By contrast, the limited use of paving in the Longmire Campground area is more in keeping with the original concept for the park's landscaping and development. Maintenance of park buildings and grounds might be improved if paved surface areas were inventoried and evaluated for need. The removal of unnecessary areas of

paving might be considered and the grounds restored to forest and meadow floor. Some areas of secondary road and parking paving might be replanned for permeable types of paving such as compacted cinders or "Grass-Crete" type block paving which would remove the harsh paved look and permit dispersion of surface water into the subgrade when not frozen.

Roofs

Nordic Style roofs with steep pitches (5:12 and up) are good for wood shingles, shakes, and for plank roofing. The steep pitches shed snow and rain rapidly and dry quickly after being wetted by rain or dew. Avalanches of ice and snow are a problem of Nordic Style roofs, damaging any projecting vent stacks and other projections through the roof and tearing off any eave troughs. Snow guards on steep pitch roofs have to be heavily built and anchored to resist the weight of the ice and snow they retain, and a failure can be disastrous to the roof and any person or construction below the avalanche area.

Snow Shedding & Retaining

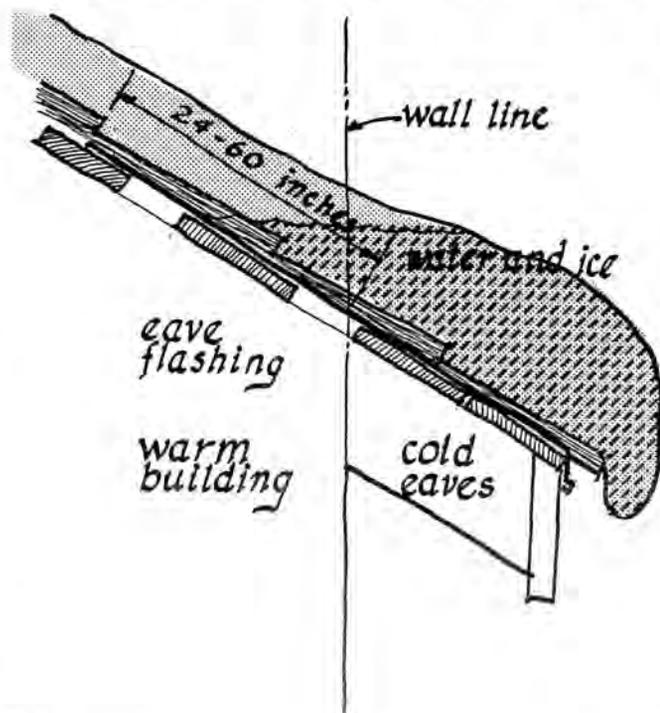


Low pitch (4:12 and lower) Alpine Chalet Style roofs are bad for shingles and shakes because the low pitch roofs retain ice and snow longer and the runoff of rain and snow melt is slower. Such wood roofs are frequently perpetually wet throughout most of the year, the wetness compounded by retained masses of evergreen needles, leaves, and moss on their surfaces and valleys. Traditional Alpine roofs were often roofed with tiles, slates, or field stones and equipped with snow guards to aid in retaining the snow covering as long as possible to add to the insulation of the roof. They were typically out in the open, away from trees, and capable of being dry once the snow was gone. Low roofs were considered to be less intrusive in the landscape and to minimize the profile of the building.

Various systems have been used to either prevent snow from sliding off roofs or to aid in its removal and prevent ice build-up on the eaves. Snow guards are installed on the eaves of roofs and up on the sloping surfaces to retain snow. Where

snow retention is not wanted, the eaves often are metal clad so snow will slide off easier. Whatever the type of roofing and its slope, roofs in alpine environments generally have extra flashing extending up the slope from the edges under the roofing to above the probable level of backed-up water from melting snow and ice which forms a dam at the colder eaves.

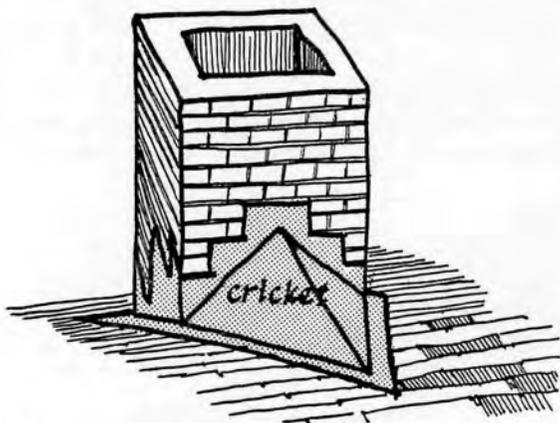
Ice Dams



Retention of snow and ice on a roof, particularly the eaves of the roof, is not desirable unless the structure of the roof and eaves is designed for the considerable weight that builds up from repeated thawing and freezing of the ice and snow retained. Eaves which retain snow and ice and were not designed for that condition are subject to severe damage when the resulting mass loosens and slides off, frequently carrying sections of the roofing with the frozen mass.

Damage to plumbing vent stacks, smokestacks, antennas, and other roof mounted structures frequently is caused by the moving glacier of snow and ice which accumulates on alpine roofs. Forethought in locating vents and smoke pipes at ridges prevents much of this kind of maintenance problem. The Guide House at Paradise is a good example. Other care should be given to insuring that these roof projections are

Cricket Protection



protected and reinforced to prevent snow and ice damage; vents and stacks as well as chimneys should have steeply sloped crickets behind them to divert the snow mass around them.

Importance of Flashing

Because of the severity of mildew and moss damage to wood roofing, it should be mandatory that all flashings, especially ridge flashings, be copper, zinc, or zinc clad stainless steel. Properly designed and used, these metal flashings provide substantial protection to a wood roof from mildew staining and moss build-up; not a replacement for regular cleaning, but an aid which will reduce the need for cleaning and prolong the life of shingle and shake roofing.

Galvanized steel sheet metal flashing should not be used for severely exposed roofs because the galvanized steel sheet metal must be prime and finish painted if it is to perform well, and this paint coating prevents the oxidization of the zinc and the benefits of that zinc tainted water runoff to the wood roofing.



Lost Rustic Details

The roof edges and ridges are important design elements of Rustic Style buildings. Old photographs may show that the roofs originally had accented shingle or board ridges or they may have had prefabricated metal ridges of various designs.

Photographs of the Oscar Brown Cabin, Longmire Gas Station, and possible the Longmire H.Q. Building show that log pole ridges were originally used and are now all removed. Of the many options, the ridge boarding and metal ridge covering is the most dependable and easiest to maintain, the shingles tend to break off more readily exposing the under flashing metal. Roof edges at eaves and rakes should have a one and one-half inch projection of the shingles over the fascia board and any trim mouldings. Anything less looks bob-tailed and exposes the under shingles and sheathing to weather damage. Ridges and valleys must have good metal flashing whatever the style of cover used.

Bright metal should not be used for flashings. Aluminum and stainless steel are inappropriate unless painted and maintained to be inconspicuous. Aluminum is a poor choice where evergreen needles are found. As previously mentioned, galvanized steel flashing is not recommended even if painted. The modern replacements for some of the traditional roofing metals, Microzinc and Tern Coated Stainless Steel, weather to a dark blackish gray color and look appropriate while providing fungicide and herbicide protection to the shingles. Copper, bright when installed, rapidly weathers to the acceptable dark brownish-green patina.

Wooden Gutter



Two kinds of eaves troughs and downspout systems are recommended as being appropriate to the Mt. Rainier buildings, the half-round style metal gutters and the cedar wooden gutters which have been salvaged for reuse at some places on Longmire buildings. Because of the susceptibility of any gutters to damage from ice and snow in this area and because of the need to readily remove and reinstall some short sections of gutters over entrances, as at Paradise, gutters

should be hung with permanent heavy duty support brackets under the gutters rather than the usual top hangers and gutter spikes. The separate supporting bracket system of gutter hanging also offers the most satisfactory method of providing for positive drainage to the downspouts or ends of each gutter section. Downspouts should all be of the plain round or rectangular pattern and fabricated with shop fabricated and soldered joints and offsets rather than pre-fab sectional construction with slip joints. Downspout brackets should support the downspout away from the face of any siding and trim.

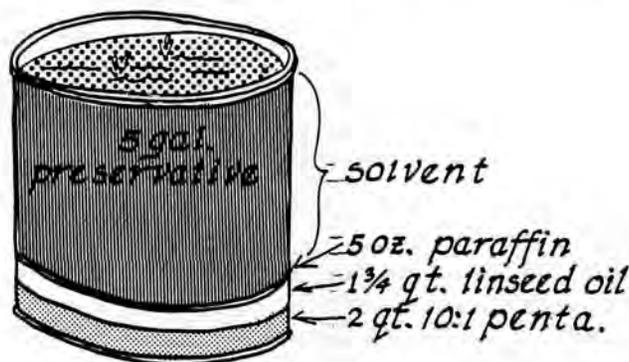
Some kinds of metal roofing are historic and may be appropriate to Rustic Style building: Corrugated galvanized sheet steel roofing, flat seam terne roofing using 20x28 inch metal sheets, and galvanized sheet steel ridge and hip covers. Flat seam metal roofing was preferred for weatherproofing low slope and flat roofs. Corrugated roofing is frequently found on secondary utility buildings and additions. Metal hip and ridge accessories were frequently used in conjunction with cedar shingles on secondary buildings. All plated and galvanized steel roofing metal must be carefully face and back prime painted before installation and finish painted after installation to assure its long life. The replacement of cedar shingle and shake roofs with metal is a major change in the appearance of the building and should be considered as to its long term effect on the landmark's historic integrity, adverse for a primary building but possibly acceptable for a secondary building.

Wood roofing requires regular cleaning to remove accumulations of dirt, debris, and needles. A function of cleaning is to remove moss build-up from surfaces and edges. Roofs should not be walked on, and it is best to accomplish the necessary cleaning by careful pressure washing or sweeping with long pipe wands and spray nozzles wherever possible.

Roof Coatings & Stains

The life expectancy of wood roofings are greatly prolonged if they are kept clean and given regular applications of a penetrating water-repellent preservative shingle stain, such as the Forest Products Laboratory Formula. Another treatment which has been found effective and is traditional is the application of graphite in linseed oil, which provides a dark grayish black sheen to the shingles and is an effective preservative. A function of either the graphite or color pigment in the shingle coating or stain is to provide for ultra-violet light protection which otherwise literally burns away the exposed wood cells, especially at high altitudes. A pigmented roof stain should be used in preference to a clear coating. It should be noted that early accounts and specifications for National Park structures included roof stains; the bare unfinished wood look is a modern style and is generally not historic.

W.R.P. Formula



The best shingle and shake installations use either hot-dip galvanized or copper shingle nails and never staples. Stapling of shingles is reported to hold them too tightly to the sheathing, contributing to splitting, increased dampness, and warping problems. Additionally, the thin gage electro-galvanized staples are less rust resistant than the heavier hot-dip galvanized nails.

Log and Heavy Timber Construction



Log Building

The Rustic Style of building incorporates many bad design elements in order to appear more rural and romantic than would be the case if it had conformed to the good design standards which were well developed for permanent buildings built for long life instead of for appearance. Maintaining these buildings forces many choices between improving their maintainability, even for conserving their original elements, and for preserving their original appearance. The alternative choices are not always compatible.

Reference to any of the standard studies on log and heavy timber construction or to a publication of the Pacific Northwest Forest and Range Experiment Station, Edward W. Schein's *The Influence of Design on Exposed Wood in Buildings of the Puget Sound Area*, Forest Service, Portland, Oregon, 1968, provides ample suggestions on the design means to prevent rot and insect damage to wood buildings. The Forest Products Laboratory booklet, *Principles for Protecting Wood Buildings from Decay*, by T.L. Scheffer and A.F. Verrall (USFS Research paper FPL-190, 1973), similarly gives more general rules for wood protection in new construction and repair work.

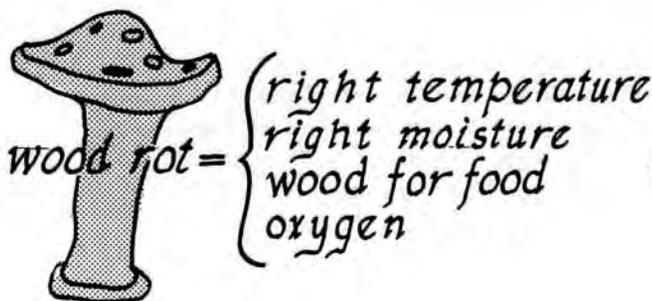
Rot & Insect Damage

Unprotected Wood Detail



The conservation and preservation of wood in buildings depends on removing or conditioning one or more of the four necessary elements conducive to decay and insect growth in wood: right temperature, moisture content between approximately twenty and thirty percent, nutrient (the wood), and oxygen. In practice the two methods used are either poisoning the wood (removal of nutrient) by preservative treatment or lowering the moisture content of the wood below the level necessary for fungus growth by painting, flashing, covering, and other means. In marine environments, fully immersed wood such as pilings and float logs where the moisture content is at or above saturation similarly prevents decay by excluding sufficient oxygen for fungus growth.

Rot's Four Parts



Protection of wood members from termite and carpenter ant attack is most generally provided by metal shielding and flashing, preservative treatment, and keeping the wood members dry. Carpenter ants are not generally deterred by flashings and paint coatings and can only be controlled by locating the nests and destroying them, use of persistent pesticides (most are now banned), preservative treatment of the wood, and by keeping the wood dry. It is important that carpenter ant infested fire wood not be brought to and stored near buildings subject to infestation. Carpenter ants will not generally build their nests in wood which is dry (15% moisture content and lower). Insecticides and preservatives in paint coatings or which are brushed on or sprayed on heavy timbers are generally not effective, because the degree of penetration is insignificant, leaving the whole interior of the wood member unprotected. Conversely, the protection to wood millwork and finish lumber offered by the Three Minute Mill Dip Treatment in a Water-Repellent-Penetrating Preservative solution, Woodlife, Pentaseal, or Forest Products Laboratory Formula has demonstrated benefits for rot, insect, and weather protection to those exposed members.

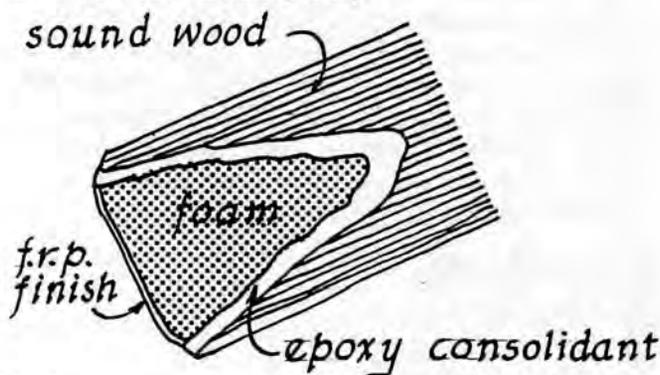


Ant Damage

Restoring Wood

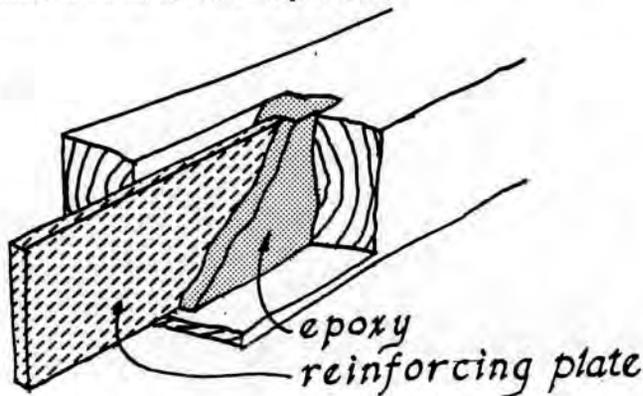
Several methods of restoration for both wood structural and decorative elements on historic buildings have been devised. The epoxy consolidant, foam filler, and fiberglass reinforced plastic repair method which was used on the rafter ends of the Longmire Headquarters Building is one which can be used by maintenance people as well as by contractors. This cosmetic restoration method cannot be said to offer permanent protection and restoration to the treated timbers as rot may still continue or begin in any adjacent sections of wood which are infected and sufficiently damp.

Epoxy-Foam Restoration

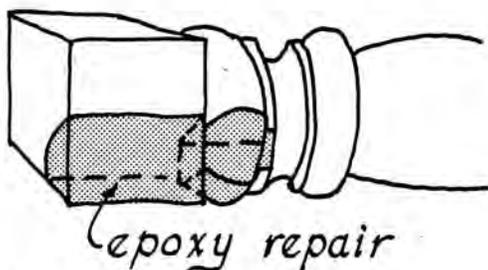


The Wood-Epoxy-Reinforcing System (WER) detailed in the booklet published by the Association for Preservation Technology is both a cosmetic and structural restoration method and may be used in maintenance work by In-House forces or by contractors for large restorations. Restorations done by this method require the designing and computations of a structural engineer to insure that the restored joint or timber meets its structural requirements.

W.E.R. System



For strictly cosmetic restoration of damaged or missing pieces of wood trim and framing members, a variety of flexible, carvable, epoxy restoration compounds can be mixed from readily available ingredients following the instructions in the NPS booklet, **Epoxies for Wood Repairs in Historic Buildings**.



Carvable Epoxy Fillers

Where repair and restoration are not practicable, replacement of the damaged member is the only remaining solution. For highly visible and principal wood members on the primary historic buildings, replacement in kind is required. The replacement member should match the original member as exactly as possible, conforming to the original species of wood, dimensions, and finish of the piece being replaced. The method of fabrication of the timber, its fastening, and shaping should be as close to the original as possible. This often means that custom dimension timbers must be sawn as the current sizes are generally smaller. A machine de-barked log or a plywood peeler core does not match the appearance of a natural log which has been hand de-barked, as at the Nisqually Entrance Oscar Brown Cabin and Longmire Clubhouse.



Machine Barked Poles

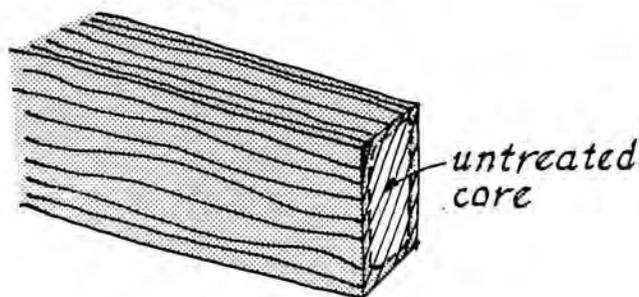
The problem of rot in foundation timbers and sills which are too close to the ground, or in it, will not be solved by the replacement with pressure preservative treated timbers as the preservative is only in the outer shell of the wood and not in the core. Where a timber replacement is required, it is possible to obtain pressure preservative treated glu-lam timbers which have been treated before lamination in which case the protection is throughout the timber.

New Log Treatments

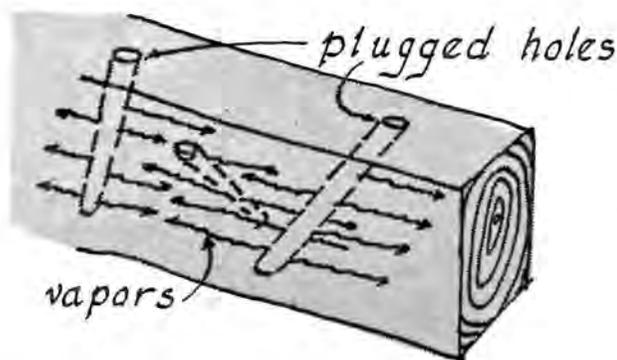


Experimental Methods

A new experimental preservation method is available which uses vapor fumigants placed within the timbers. This method was developed by Oregon State University for extending the life of wood power poles and pilings.



**Pressure
Treated Wood**



**Fumigant
Protection
of Wood**

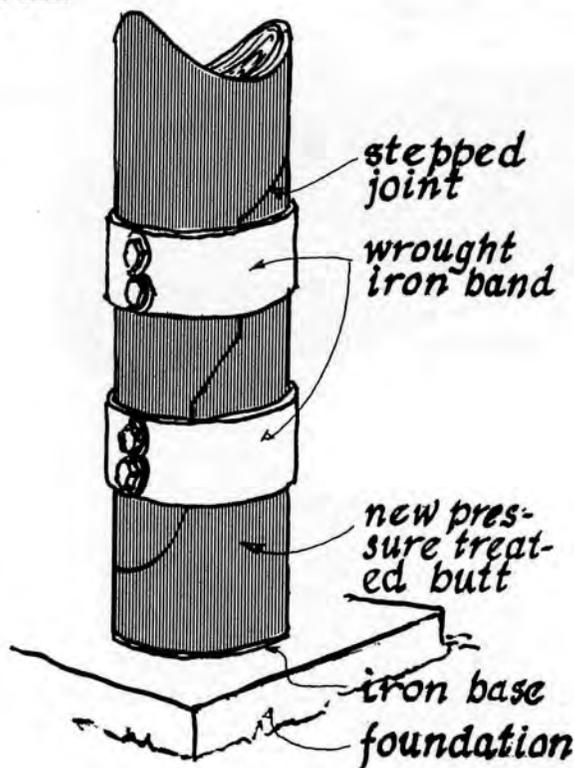
Replacing Wood

Creeping Concretion



In some cases, a substitute for the original timber can be made using precast reinforced concrete finished and painted to resemble the original timber or log. There is a degree of phoniness about this which requires separate consideration in each case.

Scarfed Restoration



Structural repairs and restorations must be regularly reviewed by a qualified architect or structural engineer to insure that structural load and earthquake resistance capabilities are adequate and in substantial building code compliance.

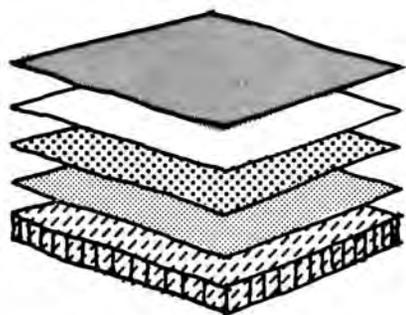
All of the model building codes contain provisions respecting the special needs of historic landmark buildings. These sections offer exemptions from strict code compliance where the public welfare is adequately protected by the measures being made to preserve and restore a landmark building. They are meant to encourage innovative solutions to accomplishing both the ends of historic preservation and code compliance. Substantial compliance with the intent of fire and life safety building codes is an essential part of historic preservation.

Iron and Steel Framing Hardware

Original heavy timber framing hardware can usually be reconditioned and painted with rust inhibiting primer so that it can be reinstalled and continue to serve its original function. Welded and stock heavy timber hardware is not a good substitute for original hand wrought iron hardware where it occurs. Additions of new framing hardware to either reinforce existing structure or to aid the installation of additional framing reinforcing should be designed to minimize the visual intrusion fo that addition. There is usually a choice of installation methods and hardware styles which aids concealment.

Sometimes it is best to frankly admit that reinforcing has been necessary and to design it to be compatible with the original work. The heavy wrought iron and rail steel reinforcing for the north chimney in the Paradise Inn's Lobby is a good example of such reinforcing.

Rust Prevention



*finish
finish
primer
primer
iron-steel*

**Paint
Protection
Layers**

Rust prevention on hardware and fastenings installed with wood members is a practical necessity for the conservation of those members and for lower maintenance. Iron and steel hardware should be hot dip galvanized whenever possible. In addition to the galvanizing, and especially when not galvanized, ferrous metal items should be given two coats of rust inhibiting metal primer before installation and a touch-up coat of primer and the finish coats of paint after installation. This seems like a lot of paint, but it is necessary if the rust protection expected is to be realized. Avoid quick drying primers and spray coats of primer whenever possible. The best primer for iron and steel remains the traditional red lead in linseed oil type in a slow drying formula. There are no special benefits from particular brands of metal primer with fish oil bases.

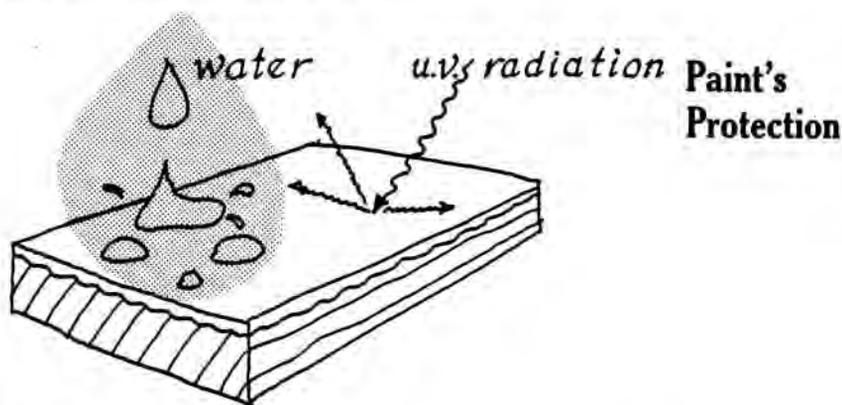


**Linked Rust
& Rot**

Maintenance on the metal fastenings and hardware on Rainier's historic buildings may be facilitated by using rust prevention technology borrowed from the railroad industry. Concealed surfaces and fastenings made of iron and steel which are in contact or contained within damp wood can be additionally protected by coating them before installation with a cosmoline-like protective film, "Rust Cote OS" sold by Interlube Corporation, Cincinnati, Ohio. Preventing rust on through bolts and lag screws enables them to retain their full strength and to prevent splitting of the timbers from rust-jacking, a progressive deterioration process which destroys the strength of the fastening and promotes rot in the wood member.

Exterior Finishes

Finishes applied to wood structural trim, and decorative members serve to both beautify the work and to offer a measure of protection to the wood. To the extent that a paint finish helps to keep the underlying wood dry, it aids in protecting the wood from rot; however, no additive to the paint will offer any rot or insect protection to the wood beyond the immediate surface which is treated or coated by the paint. Penetration from paints and stains into the wood fibers is only a small fraction of an inch, not enough to be meaningful as a preservative treatment to the wood. The principal rot protection comes from the property of the paint to form an impermeable water barrier and to shed that water from the painted surface. Stains which contain a water repellent substance, usually parafine, aid in shedding surface water. Both paint and stain keep the interior of the wood dryer than would otherwise be the case.



In addition to a measure of moisture protection to the painted or stained wood surface, the pigments in paints serve to protect the underlying wood from ultra-violet degradation. Clear stains offer no significant protection from sunlight damage. Any stain which has sufficient pigment to be effective is at the least a thin paint and not properly a stain, the relative amount of pigment content being the difference between paints and stains.

Oil or Latex Paints

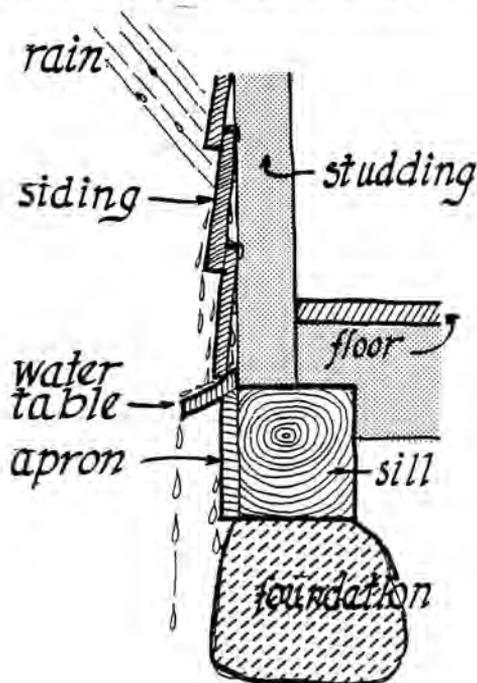
Oil base paints are preferred for use on older buildings, especially for trim enamels, as the oils used are capable of penetrating and binding the inevitable surface dirt and old coatings to a degree not possible with the newer latex paints. In addition, it is advisable to modify the currently available exterior oil base primer paints used for undercoats by the addition of approximately one pint of linseed oil to one gallon mixed alkyd type primer to increase its penetration capability and slow its drying time for better adhesion and binding effect. On new wood surfaces which are properly prepared and primed, latex paints perform as well as the older oil base paints and have the benefit of better color retention over the oil type.

Exterior latex house paints, especially if used with an oil base undercoat, have substantially the same water repellency as oil base house paints. The so-called breathability of latex coatings is not significant to their water repellency.

For critical historic preservation work, it is often necessary to have custom paints mixed and formulated using ground-in-oil pigments rather than the universal colorants now used in the paint industry.

Flashing Systems

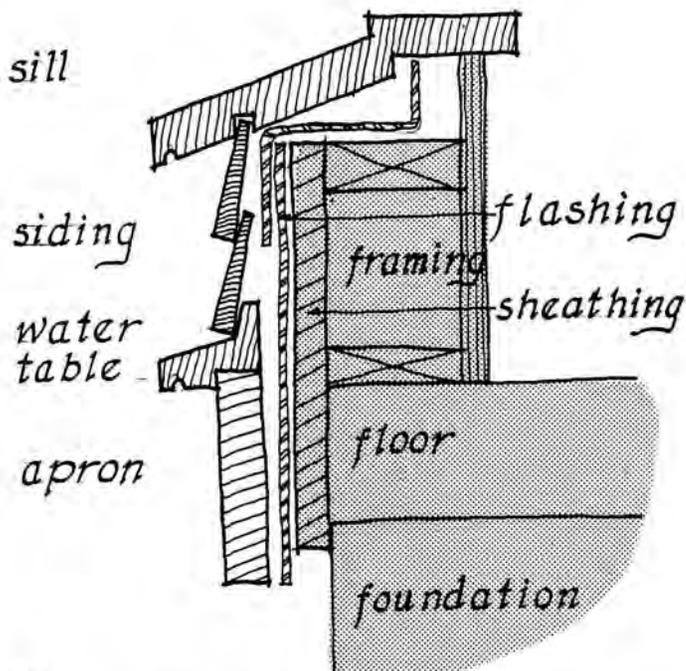
Key parts of the conservation of wooden structural and framing members of historic buildings are their integration and connections with adjacent building materials and assemblies, the siding and trim, roofing, masonry, and flashings of all kinds. These related building materials offer protection to the structural timbers and are frequently designed to be replaceable, sacrificial, parts which save the underlying structure from wear and damage. Altogether, the separate elements of a building's outer covering function as a weather protection system, and neglect of any one part may leave the whole building subject to wear and damage.



**Traditional
Frame Walls**

Ideally, the original builders accounted for these interrelated weather protection needs, and all that is needed is to maintain the original conditions and the building will remain protected and have a long life. Unfortunately, many times the original design of the building's weather resistance is inadequate and improvements must be made if it is to be satisfactorily maintained and economically preserved for an extended life as a historic landmark.

Interlocked Flashing Systems



Traditional “Well Building” technology understood that buildings will leak, and so there were built-in back up systems to intercept the leaks of water and air and to divert these intruders back outside. Maintenance of a landmark building involves the identification of these weather-proofing and back-up systems and their preservation or restoration. Original poor flashing details, like the roof and rear chimney on the Longmire Clubhouse need improvement when the fireplace chimney is rebuilt. Make the needed improvements in a sensitive manner which will not compromise the integrity of the historic building, add to its burden of problems, and be visually obtrusive.

The Clubhouse Chimney



An example of an original design deficiency is the joint between the south end wall framing and finish and the stone masonry chimney at Paradise Inn. Here, there is a one to two inch wide gap between the frame wall and finish and the stonework which permits direct entry of rain, snow, wind, and dirt into the main lobby. There is evidence that various temporary measures have been attempted to close and control this gap for over sixty years, but there have been no serious measures taken to make a permanent system of closure for this breach in the building's physical envelope with its consequent damage to the interior environment and contents. The roof-wall joint at north lobby end also looks like a long time problem area.

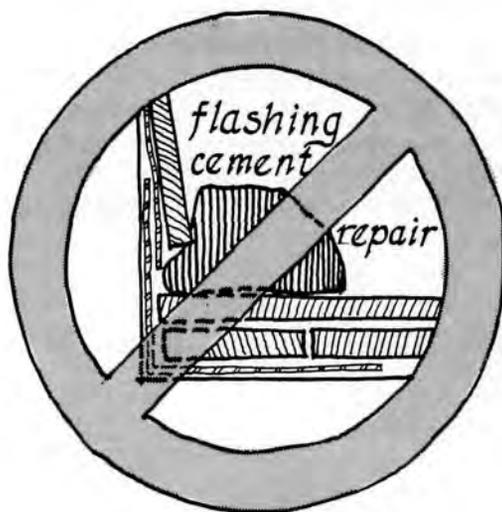


**Lobby
Roof-Wall**

There are generally no satisfactory substitutes for the proper installation and maintenance of the weather proofing of these building joints. Inattention to these protective systems at the time of roofing repairs or replacement, siding repairs, plumbing installation and when doing all kinds of exterior maintenance and repair work will result in accumulated serious problems

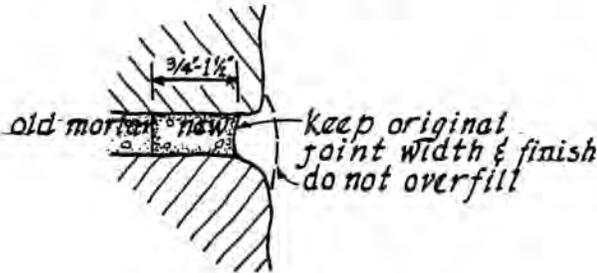
for the building. Plastic flashing cement repairs are always temporary and very often add to later maintenance problems. It is especially important to never mix coal tar and asphalt based roofing materials as they are incompatible.

Stop Goop Repairs



Masonry

The rockwork masonry at the Mount Rainer Park buildings appears to all be in generally good condition and to not require anything more than routine repair where physically damaged or damaged by direct weather related causes. When inspection determines that tuckpointing is required to restore weather tight condition, no special techniques are recommended other than to maintain the original materials and methods of construction. Mortars used at the time of construction of the Mt. Rainier buildings would typically all be high in Portland Cement quantity with possible only ten percent lime added for workability. The mortars are hard and durable and do not appear to be causing any incompatibility problems with the stone masonry units.



Tuckpointing Art

The application of clear sealers, so-called waterproofing or water repellent coatings, and paints to historic masonry is not recommended. These coatings have very little value as masonry preservers despite the extensive manufacturer's claims; and their use begins a cycle of repeated applications and is very likely to increase rather than reduce masonry problems.

The later addition of stonework veneer over wood constructed foundations and walls of earlier buildings is a source of concern for maintenance. Properly flashed and sheathed, such an installation causes no problems, but if the masonry veneer addition causes or aggravates a moisture problem in the concealed wood construction, rot becomes a major problem and that part of the building will eventually require reconstruction. Similarly, the use of wood lintels within stone masonry walls is a romantic and unsound conceit which

warrants frequent monitoring to insure that timely preventive measures can be taken to prevent rot in the lintel, especially the spread of any such rot into the inner structure and trim of the building. When replacing such a rotted lintel timber, consideration should be given to its replacement with either a steel or treated wood structural lintel concealed behind a veneer of log section, with appropriate concealed flashing to protect the structure.

Wood Lintels



Fireplaces

The chimneys and fireplaces are important elements of the Rustic Style buildings of the park and should be maintained and reconstructed where possible to maintain the original quality of the buildings. Particular attention must be given to the joints between fireplaces and chimneys and the exterior walls and roofs of the buildings. The proper installation and maintenance of flashing at these points is critical to the maintenance and preservation of the buildings.

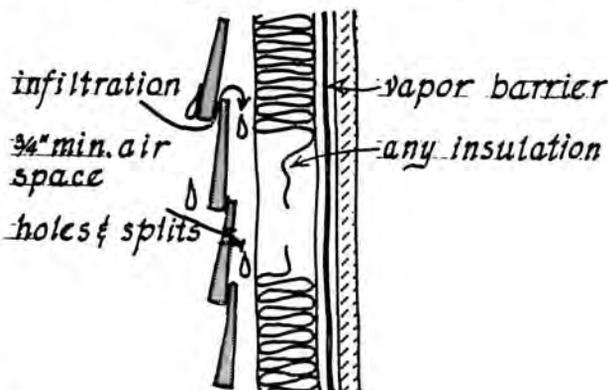
Unused fireplace chimneys, service chimneys and flues should have removable weatherproof caps installed to keep out water, debris, and animals.

Fireplace linings are an important part of any fireplace-chimney system and should be maintained or replaced as required to prevent damage to the main masonry. Maintenance repairs can be made to the firebrick lining of a fireplace by tuckpointing and patching with refractory cement. Anchorages for any fireplace ironwork should be inspected to insure that it is sound and not making the lining bricks loose. Fireplaces and chimneys which have been unused over the winter season should be dried out slowly before subjected to the intense heat of a large fire, otherwise damage to the masonry may occur by rapid drying and shrinkage cracking and spalling of mortar and masonry units from moisture trapped within.

Foundations and Walls

Mount Rainier's Rustic Style buildings have a variety of sidings and trim types. Shingled siding, horizontal lap siding in varying widths and thicknesses, board-and-batten and board-on-board vertical siding, and simulated half-timbering and shingle panels are some of the styles found in addition to the log cabin type walls. Nearly all of the buildings have been painted or stained at this time. Whether or not they were painted originally, the continuation of exterior painting of the sidings and trim work is a recommended aid to their maintenance and preservation. Except for those buildings employing hand hewn and hand barked heavy timbers and logs in their construction, all of the buildings appear to employ either rough sawn or sawn and planed dimension lumber in their construction. The sizes, surface texture, and appearance of the lumber and timbers used in Rustic Style buildings was intentional and must be maintained if their quality is to be preserved. To that purpose, the use of lower pigment content oil base stains is preferred to the high solids content exterior paints because of the lessened paint build-up which tends to obscure the original texture of the buildings. Spot painting and touch-up work instead of full repainting will lessen the accumulation of hiding paint build-up on textured surfaces. Use semi-gloss and egg shell exterior paints and enamels to lessen the highlighting of surface defects in old woodwork.

Adding Insulation



**Keep
Insulation Dry**

Special attention must be given to the problems inherent in the older buildings which have no sheathing, building paper, and flashings installed under their sidings over the stud framing. These walls tend to leak under storm conditions and have survived without rotting because the water which enters them is permitted to dry out rapidly when the storm has passed and dry weather returns. The same openings which permit the water to enter also permit air to enter and circulate within the wall cavity to dry it out. Adding insulation to one of these walls, without insuring its watertightness, upsets what has been a stable condition and is sure to promote rot where none existed before. The Library and National Park Inn buildings at Longmire were particularly noted as being buildings which should be closely monitored for evidence of wet insulation and new rot within their walls because of this changed condition.



**Unprotected
Wet Insulation**

Every attempt must be made to insure that the exterior weatherproofing system of the building's walls and the penetrations of windows, doors, fixtures, and vents is maintained and improved with new flashing wherever possible to prevent the entry of moisture within the wall structure, and at the same time, to maintain any exterior wall ventilation systems which permit moisture to be removed. This attention to the water tightness and ventilation of Rustic Style building walls is in addition to the question of vapor barriers introduced at the time any interior finishes are altered, insulation added to stud spaces, and occupancy changed to one which produce additional moisture which may condense within the walls. Insulation of attics and crawl spaces is less of a problem so long as the spaces are adequately ventilated (in cold weather too), vapor barriers are installed to the interior surface, and other moisture protective measures are properly installed to current standards.

Good practice dictates that all of the wood siding on a historic building should not be replaced in a wholesale manner when it is possible to make spot replacements of badly damaged sections of the boards or when patching and plugging repairs can be made satisfactorily without replacing the board. It is not possible to replace all of the siding on a building at one time without "Renewing" the appearance of the building and losing its "Aged" look. Frequently, it is not practicable to obtain the original size and surface finish of the original boards, whereas it is possible to obtain a small piece for patching or replacement to match the adjacent work. Care dictates that all nails used to refasten or replace wood siding and trim should be hot-dip galvanized and have heads which match the original work or which can be concealed so as to be unnoticeable after the repair is made. Attention must be given to the location of patches and cut-outs for replacement so that the additional joints will not make new patterns in the field of siding which detract from the original appearance.

New Foundations

Exposed New Foundation



The need to replace foundations of historic buildings is not peculiar to Rustic Style Buildings. The fact that these buildings typically were built very close to the ground does make the need for foundation replacement necessary in many cases if the building is to be preserved, making the design of that replacement foundation critical if the low-to-ground quality is to be preserved. Covering existing wood foundation structures with stone veneer is not recommended without substantial reconstruction and weather protection of the frame construction to be concealed. New foundations of either monolithic concrete or concrete masonry can be very satisfactory if sensitively designed and painted to match. Installing replaceable wood skirting over the new foundations can fully conceal their new appearance. Attention must be given to the preservation and maintenance of the upper weather protection systems of the original wall which are designed to protect and save the foundation timbers and framing, specifically any water table trim and skirting or apron boards. In some cases, the installation of original style, expendable, skirting and apron boards is an acceptable means of concealing the fact that a new footing has been installed; however, any expendable skirting and aprons must be separated from the permanent construction above by flashing. Any foundation crawl spaces created by new foundations must be ventilated and the ventilation maintained during cold weather as well as warm. Insulate any water pipes and heating ducts to prevent heat loss and freezing rather than closing crawl space vents.

Doors, Sash and Hardware

Window & Door Importance



Rustic Style Buildings in Rainier Park are fitted with several varieties of the stock millwork doors and window sash which were commonly available throughout the time of their construction. Many of these types of doors and sash are still available or can be readily manufactured by millwork shops. Doors were variously multi panelled stile and rail types of northwest softwoods, either half-lite or full multi-lite styles. Windows are either double run or casement styles, two, six and eight lite upper sash over one and two lite sash and multi-lite divided style casement sash. Window casings are uniformly plain rectangular style terminating at sills on the exterior and at sills and plain aprons on the interior, with door casings to match. Window and door hardware was stock utility type without ornamental escutcheon rings and knobs, plain brass, bronze, bauer-barff (dull black), or japanned finishes. Architectural bronze, black anodized, black chrome, and black nylon finishes would be suitable modern replacements for the original finishes, some of which are no longer available.

Appropriate Hardware Finishes

wrought iron - dull black
japanned - bright black
brass
architectural bronze
white enamel

Replacements for damaged doors and window sash should be made in kind with the added proviso that all new millwork should be "Three Minute Mill Dip" treated in penetrating-water-repellent-preservative before delivery. New, concealed weatherstripping and insulated glass should be used. The careful back priming of all replacement millwork assemblies and trim with a good exterior housepaint primer cannot be too highly stressed as being essential to obtaining satisfactory long life, freedom from maintenance problems, dimensional stability, and rot resistance after installation. The tops and bottoms of doors after fitting are especially vulnerable to water damage if not painted.

Maintenance of the building's doors and windows will be greatly facilitated if a selection of hardware types, sizes, finishes, and brands is made and standardized for both concessionaire and park personnel maintained facilities. This will improve the appearance and style consistency among the park's buildings as well as insuring that the correct item of hardware is available for repair and replacement and to prevent damage to the otherwise uncontrolled or improperly operating door or window. Presently, there are too many missing, broken, or miscellaneous styles of door and window hardware among the many buildings to permit their good maintenance.

Storm Doors & Sash

The original doors and window sash were not equipped with storm sash and doors. This addition is appropriate if done with matching wood frame storm sash and doors hung with traditional sash hangers and control hardware in rabbeted stops in the existing door or window frame. It is not necessary, or even desirable, for the storm sash and doors to make a hermetic seal in the opening, some ventilation between the storm sash and frames prevents condensation and frost. As an alternative, the installation of narrow frame, preferably color annodized to match the trim, aluminum storm sash is not objectionable if recessed within the existing window frame's stops; however, this type of storm sash cannot be opened and adjusted in the same manner as standard wood frame sash.

Good Stormsash Poor Replacement



The installation of large frame, externally mounted, combination storm sash and screen storm sash and doors overwhelms the plain appearance of the Rustic Style buildings as well as tending to "flatten" the appearance of the building faces more than the other styles do. Other types of either wood, plastic covered, and metal prime replacement window wash do not have the same visual qualities as the original windows and are an objectionable alteration to the appearance of the buildings.

Winterization window and door covering panels, as used on Paradise's buildings, need a planned and permanent installation system to prevent the damage caused by nailing to the frames and casings. Wood storm sash hardware might be used with permanent quality plywood cover panels.



**Inappropriate
Vestibule**

The wooden storm doors which have been used at many entrances to buildings within the Park appear very appropriate to the buildings, as if original to them. Not so the storm vestibule addition used at several buildings. When storm vestibules are required, their construction using the same materials and finishes as the original buildings should be encouraged.

The replacement of existing doors and sash is not a recommended way to conserve energy, because other factors are more productive.

Interior Alterations

Mount Rainier National Park building interiors have been altered and "improved" in many cases so that the original design intent of the Rustic Style builders has been lost. Interior qualities which are important and need to be preserved are the plain oil finished wood floors, plain unpatterned (battleship), linoleum, paving stone and concrete flooring, natural finished softwood trim, wainscoting, paneling and other interior finish woodwork, original doors and glazing, hardware, decorative painting as in Paradise Inn, and painted stipple textured upper walls and ceilings whether plaster, gypsum wallboard or Celotex board.

Original Interiors



Alterations to building interiors should be made consistent with the design of the original work. Long range planning should be used to keep interior alterations to a minimum rather than changing partitions each time personnel changes.

Interior alterations and rehabilitation in historic buildings are



inevitable if they are to be kept and used to meet current needs rather than their original uses. Whenever possible, cost-benefit studies should be made to insure that the construction and materials selected for interior alterations are fully consistent with the original qualities of the buildings and consistent with the intention to preserve the buildings well beyond the life expectancy contemplated by the builders forty to eighty years ago. Toilets especially appear to have suffered from expedient modernization and the incorporation of low cost materials and make-do installation which is not compatible with the preservation of the buildings as historic structures. The interior decoration and alterations made to maintain and improve National Park Inn have almost totally erased any sense of the original quality of staying in that building. The lodging areas of Paradise Inn and its Annex have been transformed from any resemblance to their Rustic Style beginnings into clones of Holiday Inn, a visual appearance totally inconsistent with the presumed reason for visiting the park.

The replacement of combustible Celotex type interior wall board with incombustible, fire resistance rated wallboarding, is generally desirable but not absolutely necessary in all cases. The use of intumescent paints on combustible wallboard may be acceptable in some areas to mitigate the fire hazard problem. Whenever the Celotex type board is replaced, the replacement gypsum drywall or veneer plaster installation should be finished to match the stippled surface texture of the fiber board so that the soft appearance is maintained after painting. The use of flat latex paints which have had silica added to increase the "ropiness" of the paint is recommended to minimize highlighting wall defects and to stimulate the texture and brush marks of the original kalsomine type interior paints.

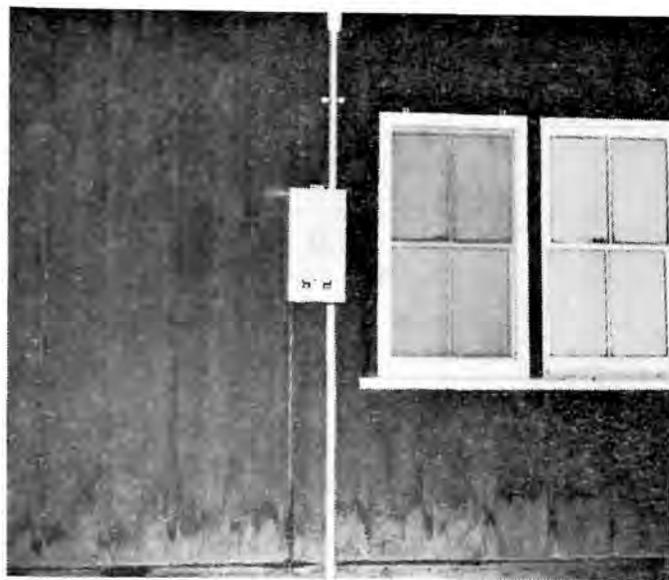
Original interior ceiling heights and finishes are important design elements to be preserved wherever possible. Many ceilings were furred down and modernized in recent years in the interest of improving acoustics, energy conservation, and lighting modernization. Now, those methods of acoustics, energy and lighting modernization are found to be inefficient and higher, open, ceilings and "task lighting" are the current solutions for rehabilitation. Transitory building fashions are great destroyers of the best architectural qualities of historic buildings.

Gaslights?



Mechanical and Electrical Utilities

Utilities installations in historic buildings are very important to the preservation and maintenance of those buildings and can severely impact the visual quality of those buildings. Whether as replacements for original installations or for additional requirements, consideration must be given to the impact they will make on the buildings: the enhancement of those buildings, reducing their quality as landmarks, and possibly adding to the maintenance load for those installations. New electric service entrance equipment can be planned to be inconspicuous, if not almost totally concealed, within the structure. New high efficiency furnace types and venting aids make it unnecessary to add ugly vent stacks and smoke pipes to a historic building and to maintain those new vents and pipes under difficult conditions. For the primary historic landmark buildings, consideration should be given to adding wiring and piping installations in a manner consistent with the original design intent of the builders, concealing conduit where possible rather than running exposed conduit, pipe, and wiremould throughout the interiors and over the exteriors because the installation is easier and more convenient.



Too Visible Services

Lost Valuable Space



New furnace types and locations inside historic buildings require careful consideration. The wrong location can waste valuable space and add to maintenance problems. Newer types of furnaces are more efficient and do not require the addition of large exterior smoke stacks.

Lighting Fixtures

Adoption of a consistent style among replacement lighting fixtures and device plates is recommended. There is a noticeable lack of uniform standards for color and style of outlet plates throughout the buildings and for both interior and exterior lighting fixtures. Plain industrial type porcelain enameled steel and cast and wrought iron exterior fixtures might be standardized for outside use. Interior luminaires require more study and offer a wider selection of appropriate style fixtures for utility and public areas depending on whether or not they are incandescent or fluorescent type. The painted parchment shades on the chandeliers in Paradise Inn's Main Lounge are examples of replacements which appear "as original." Reflector flood lamp fixtures can spoil an otherwise well preserved and maintained rustic building.

Poor Lighting Fixtures



Old style interior lighting levels were never as bright as we expect to find today. an illumination level of 30-foot candles (300-lux) was considered high enough for detail work and studying, less than one third of some current standards. Old incandescent lamps were heavily shaded, and indirect light reflected from ceilings or direct lighting from clustered low

wattage lamps was the common way of providing general artificial illumination. the old styles of low level general illumination are now again preferred in combination with higher intensity task lighting at the point of use, the return to interior lighting methods that are much more compatible with the way old interiors had originally appeared.

Whenever possible, all original lighting fixtures should be preserved. When their removal is necessary, they should be salvaged and stored away for reuse after reconditioning. Most times, the original old lighting fixture can be restored and reconditioned by one of the qualified architectural lighting specialty contractors for less cost than their replacement by a new fixture of equal quality, and considerably less cost than for remanufacturing a replica of the original fixture.

Energy Conservation

Each energy conservation measure planned for Mt. Rainier Park's historic buildings must be evaluated in terms of the relative savings to be actually made and the permanent impact for preserving or degrading the significance of the affected buildings. The potential for permanent damage to wood frame walls from the ill considered addition of thermal insulation in weather permeable stud spaces has been mentioned. Traditional methods of door and window weatherization are usually more cost effective than replacement of the original doors and sash with new insulating units and keep the original appearance.

Unless carefully planned, exterior caulking to seal the exterior of wooden buildings is as likely to trap moisture within the structure where it can cause rot as it is to keep water out of the structure. Air infiltration heat loss costs may be less of a problem than any moisture problems induced by the caulking.

There are quite appropriate double glazing, storm sash, shutter and blind, and drapery solutions to window heat losses which have a favorable cost-benefit ratio and do less visual damage to historic interiors than patent systems of insulating blinds.

Each historic building is a unique structure with its own conditions, and no single uniform system of energy conservation is equally suitable to all buildings. Many buildings can be maintained at a lower temperature setting if adequately ventilated and avoid the cost of major conservation improvements. Energy conservation measures must be carefully planned and evaluated for each building if real long term savings are to be counted.

Handicapped Access

The handicapped access walkways and ramps provided to the Longmire Museum and National Park Inn are excellent examples of the way these necessary improvements can be made for near grade level buildings and floors. Upper level and basement floors and buildings which are on inaccessible sites may be made accessible to the handicapped only at either or both excessive cost or serious adverse impact to the historic qualities of the buildings as landmarks. Audio-visual aids, photograph albums, and illustrated graphic displays are some of the interpretive tools that have been used in lieu of extremely expensive or damaging physical methods of making a facility fully accessible to the handicapped. Building code exemption provisions for historic buildings apply to these strict requirement for accessibility for the handicapped.

Improving on History

Almost Looks Too Good



Historic preservation enthusiasts too frequently make the mistake of “restoring” a historic building so that it appears better than it ever was, resulting in a “Best of All Possible Worlds Restoration.” It is very rare that any single building or group of buildings incorporates all the best qualities associated with a particular style or era.

Do not replace the “original ugly” work on a historic building if that is the way the building was built and remained throughout the years. Make necessary improvements for the

preservation and maintenance of a building so that the old rustic or ugly appearance is kept; otherwise people will be led to mistake the improvements for the original conditions and misinterpret the experiences of the early builders and users. Where significant improvements are unavoidable, the original conditions being unacceptable for current demands, then a clearly modern improvement is preferred, one that employs the best current materials and workmanship as might have been used by the original builders if they had had your options today.

Advance Planning

Maintaining historic landmark buildings is more difficult if the right materials in the right quantities are unavailable. Rare and special materials may need to be ordered well in advance of their need and maintained in adequate stock ready for timely use. The salvaging and stockpiling of exceptional original doors (like the ones from Sunrise Lodge) and old cedar gutter sections are examples of conservation methods which should be encouraged.



Salvage Gutter

Advance planning and stockpiling of hard to get materials will save on emergency and small custom made orders of non-stock items as well as keeping the historic buildings as near to their original condition as is possible.

Salvaged pieces from historic buildings make invaluable patterns from which to have replacement pieces remanufactured; no drawings or photographs can adequately replace them. Unique millwork such as cedar gutter stock may be no longer commercially available, and any salvaged sections will be more appropriate materials for use where a short gutter trough is needed than any new metal section would be.

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