City of Aspen Historic Contractor License Training Manual

THE CITY OF ASPEN

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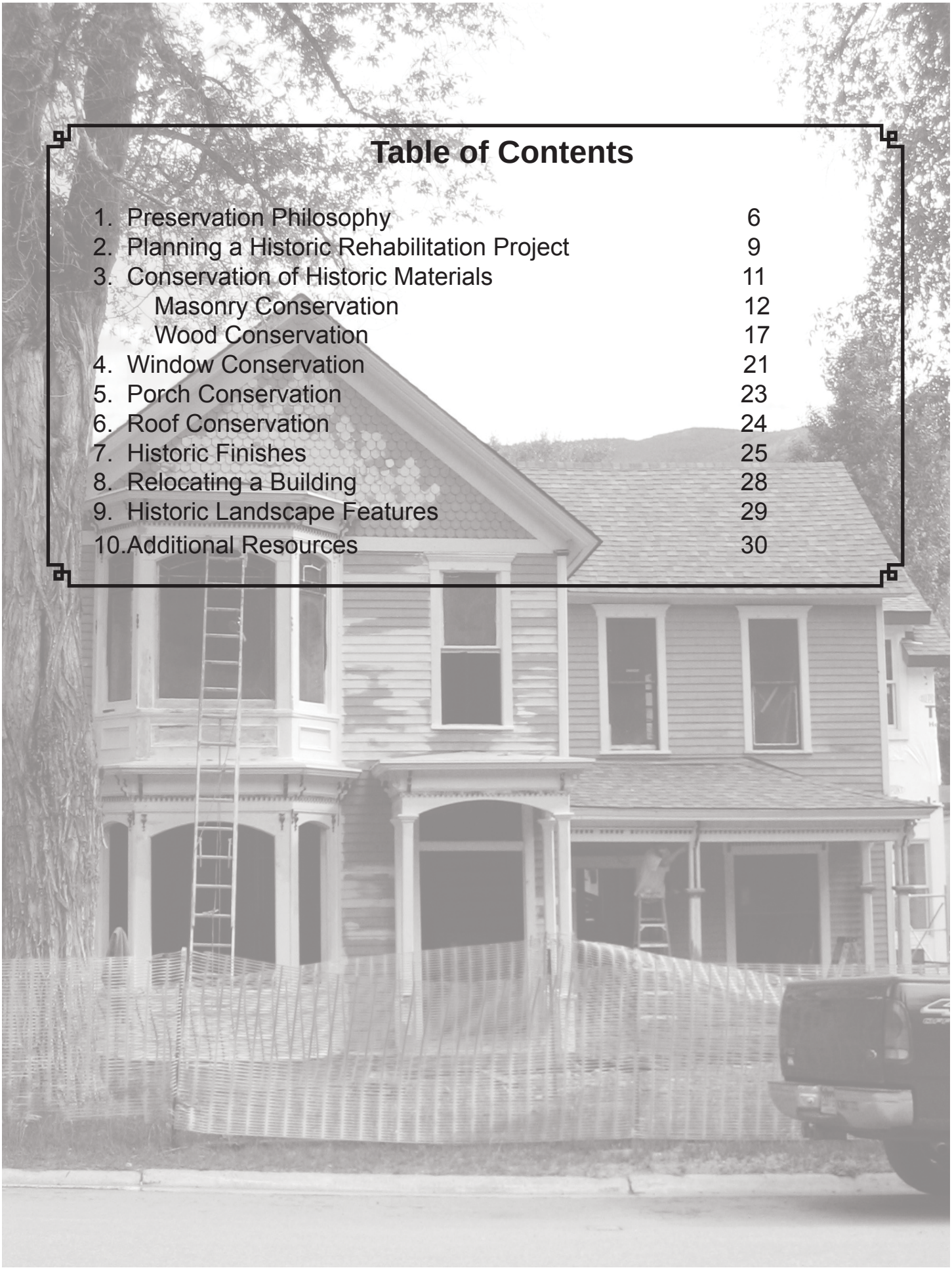

The Historic Contractor License Training Manual is intended to enhance the knowledge base related to preservation and rehabilitation of historic buildings in the City of Aspen. The information is primarily technical in nature and is based upon fundamental preservation philosophy and concepts of preservation design.

The information contained within this document is aimed to educate the professional building community, which includes contractors, tradespersons, planners, architects and developers. Additionally, the individual property owner can benefit from a better understanding of the philosophy of and technical procedures involved with historic rehabilitation.

How Can the City of Aspen Historic Contractor License Training Manual be Used?

The manual can be used to:

- Prepare building owners, architects, contractors and tradespeople for proper rehabilitation planning.
- Inform contractors of alternative technical options in the rehabilitation process.
- Enlighten historic building owners as to the standards they should expect from contracted tradespeople.
- Clarify specifications in building rehabilitation contracts.
- Direct building owners, architects and contractors to information resources that will help facilitate appropriate rehabilitation procedures.

Contractor Certification Procedure

The City of Aspen Community Development Department requires a certification process for individuals involved with construction on a historic building. This manual is the primary educational source for the certification program. The successful applicant will receive a Historic Specialty Contractor license, which must be renewed.

The Certification Exam is administered through the Community Development Department. All information included in the Certification Exam can be found either within this document, or in the “Required Readings” listed on the following page.

Who Requires Certification?

The general contractor and/or their field supervisor must have certification when providing construction on a historic building. In the event that new personnel are assigned, the replacement contractor and/or field supervisor must have certification.

What happens if unexpected conditions appear during construction?

Any discovery of historically significant information during the construction process requires that the general contractor or field superviser notify the City of Aspen historic preservation staff at 920-5090. Any special conditions must be left undisturbed until agreement on how to proceed.

Strongly Recommended The contractor is strongly recommended to attend the Aspen Historic Preservation Commission final review hearing for their project. This will allow the contractor to bring up issues and questions about the historic preservation process.

Qualification Standards for Building Tradespeople

Benefits of Preservation Training & Qualification Standards

Currently it can be difficult for tradespeople to acquire the necessary skills in order to work on historic buildings. There are significantly more educational programs oriented towards consultants and designers in the preservation field. This has created a situation where there are ample professionals to plan and specify fine restoration work, but a shortage of qualified workers to complete the restoration work.

By ensuring that skill, quality and experience, not low cost and speed, are the factors that determine who in the preservation trades gets a job, it is easier to maintain a higher caliber work-force. If low cost and speed are the determining factors, skilled craftspeople and preservation contractors cannot compete against unskilled contractors in the preservation field.

A system of qualification standards increases the public's ability to understand the skills required amongst trades people in the preservation industry.

Where to Find the Materials

All required materials and recommended materials are compiled in a collection called the "Historic Preservation Resource Library" located in the Historic Preservation Office at Aspen City Hall. Many of the resources are periodicals and are also available through organizations listed in the "Additional Resources" chapter of this document.

The Training Manual and required readings can be viewed on-line at *www.aspenpitkin.com.*

List of Required Readings

The following materials, in addition to this manual, are required study materials for the Aspen Historic Contractor License Certification Exam.

1. American Institute for Conservation of Historic and Artistic Works. Code of Ethics. http://aic.stanford.edu

2. "Preservation Brief 6: Dangers of Abrasive Cleaning to Historic Buildings", Anne E. Grimmer. Washington D.C. Technical Preservation Services, National Park Service, U.S. Department of the Interior. 1979.

3. "Preservation Brief 2: Repointing Mortar Joints in Historic Masonry Buildings", Robert C. Mack and John P. Speweik. Washington D.C. Technical Preservation Services, National Park Service, U.S. Department of the Interior. 1998.

4. John Leeke. "New Life For An Early Doorway" in Old-House Journal. March/April 1993.

5. "Preservation Brief 9: The Repair of Historic Wooden Windows". John H. Myers. Washington D.C.Technical Preservation Services, National Park Service, U.S. Department of the Interior. 1981.

6. Steve Jordan. "Details that Endure" in Old-House Journal. May/June. 1999.

7. "Exterior Woodwork 1: Proper Painting and Surface Preparation" in Preservation Tech Notes. Sharon Park. Washington D.C.Technical Preservation Services, National Park Service, U.S. Department of the Interior. 1986.

8. "Exterior Woodwork 2: Paint Removal from Wood Siding" in Preservation Tech Notes. Alan O'Bright. Washington D.C. Technical Preservation Services, National Park Service, U.S. Department of the Interior. 1986.

Associated Programs

The following is a list of programs and agencies which are referred to in this document:

Aspen Historic Preservation Commission (HPC).

This is a commission of Aspen citizens appointed by the Aspen City Council. They are responsible for reviewing design and project proposals involving historic buildings for the permit process.

Aspen Historical Society.

This is a private-non-profit organization that maintains records and artifacts of Aspen's history. They are a civic group and not a city department. AHS is a great resource for historic photographs.

City of Aspen Historic Preservation Guidelines.

These guidelines provide the City of Aspen, through its Historic Preservation Commission, a basis for making informed, consistent decisions about proposed new construction and alterations to buildings and sites in the community for the formal permitting process.

Colorado State Historic Preservation Office.

This State office maintains the largest collection of historic information, photos, drawings, maps and records for the state of Colorado. In addition, it offers educational programs and guidelines for historic research, preservation planning and technical assistance. A branch of this department administers the State Historical Fund, a grant program for historic and preservation related projects.

National Park Service (NPS).

The National Park Service is administered through the United States Secretary of the Interior. It is the primary agency for establishing national standards and regulations affecting historic buildings and properties. The NPS offers educational programs, technical assistance and maintains the national archives for historic buildings and properties. The major sources of historic data are recorded in the Historic American Building Survey (HABS).

National Register of Historic Places.

The NPS has established the Secretary of the Interior's Standards for the Rehabilitation of Historic Buildings, which are the national preservation standards for historic buildings and used as determining factors for awarding federal income tax credits.

1. Preservation Philosophy

Why Preserve Historic Resources?

Across the nation, thousands of communities promote historic preservation because doing so contributes to neighborhood livability and quality of life, minimizes negative impacts on the environment, and yields economic rewards. Also, many property owners are drawn to historic resources because the quality of construction is typically quite high and the buildings are readily adaptable to contemporary needs. These same reasons apply in Aspen.

Preservation of the built environment in Aspen is a fundamental link to its past. Many of Aspen's buildings and homes are resources that tell the story of its heritage and unique historical development. Preserving these resources creates a sense of place for those who live in the community, and orients visitors to Aspen's heritage.

Construction quality

Many of the historic structures in the city are of high quality construction. Other buildings were of more modest construction, but used lumber from mature trees that were properly seasoned and typically milled to "full dimension", which often yielded stronger framing. Masonry walls were carefully laid, resulting in buildings with considerable stability. Also, these structures were thoughtfully detailed and the finishes of materials, including fixtures, wood floors and trim, were generally of high quality, all features that owners today appreciate. By comparison, in today's new construction, materials of such quality are rarely available and comparable detailing is very expensive. The high quality of construction in historic buildings is therefore valuable for many people.

Adaptability

Owners frequently find that the floor plans of historic buildings easily accommodate comfortable lifestyles and support a diversity of populations. Many rooms are large, permitting a variety of uses while retaining the overall historic character of the structure. Historic buildings that are smaller in scale often have open lot space that can accommodate an addition, if needed.

Livability and quality of life

When groups of older buildings occur as a historic district, such as along Main Street in Aspen, they create a street scene that is pedestrian friendly and encourages walking and neighborly interaction. Mature trees, historic fences and decorative architectural features contribute to a sense of place that is unique for each historic neighborhood - an attribute that is difficult to achieve in newer areas of town.

Environmental benefits

Preserving a historic structure is also sound environmental conservation policy because "recycling" the structure saves energy and reduces the need for producing new construction materials. Five types of energy savings occur:

- Energy is not consumed to demolish the existing building and dispose of the resulting debris.
- Energy is not used to create new building materials, transport them and assemble them on site.
- The embodied energy, which was used to construct the original building and its components, is preserved.
- Pressure is reduced to harvest new lumber and other materials that may have negative effects on the environment of other locales where the materials are produced.
- Because older buildings are often more energy- efficient than new buildings, when properly used, heating and cooling needs are reduced as well.

Economic benefits

Historic resources are finite and cannot be replaced, making them precious commodities that many buyers seek. Therefore, preservation adds value to private property. Many studies across the nation document that, where local historic districts are established, property values typically rise, or at least are stabilized. In this sense, designation of an historic district appears to help establish a climate for investment. Property

owners within the district know that the time and money they spend on improving their properties will be matched with similar efforts on surrounding lots. Their investments will not be undermined by inappropriate construction next door.

The condition of neighboring properties also affects the value of one's own property: people invest in a neighborhood as much as in the individual structure itself. In historic districts where investment is attracted, property owners recognize that they each benefit from the commitment of their neighbors. An indication of the success of historic preservation is that the number of designated districts across the country has increased such that an estimated 1,000,000 properties, both as individual landmarks and in historic districts, are under local jurisdictions.

Preservation projects also contribute more to the local economy than do new building programs because each dollar spent on a preservation project has a higher percentage devoted to labor and to purchase of materials available locally. By contrast, new construction typically has a higher percentage of each dollar spent devoted to materials that are produced outside of the local economy and to special construction skills that may be imported as well. Therefore, when money is spent on rehabilitating a building, it has a higher "multiplier effect," keeping more money circulating in the community.

Rehabilitating a historic building also can cost less than constructing a new building. In fact, the city's standards for rehabilitation of historic structures promote cost-saving measures: they encourage smaller and simpler solutions that in themselves provide savings. Preserving building elements that are in good repair is preferred, for example, rather than replacing them.

Incentives for preservation

Special incentives also exist to help offset potential added costs of appropriate rehabilitation procedures. Income tax credits are offered at the state and federal levels for appropriate rehabilitation. In some cases, the city also can provide special zoning incentives and can help to expedite development reviews associated with preservation projects. Eligible projects can qualify for the Colorado Historical Society State Historical Fund.

Image 1: The designated Crandall building on Hyman Ave. was approved by HPC to have a penthouse addition, which is an example of not freezing a building in time.

Basic Preservation Theory

Preservation theory often includes the following concepts:

- Preservation is not freezing a building in time, but rather creating a sense of time and place within the built environment.
- Preservation encourages adaptive reuse of a building.
- Preservation seeks to maintain the defining architectural characteristics from a building's period of significance.
- Preservation encourages new construction that complements existing historic buildings, but stand as a representation of its own time.

Preservation Principles

The following preservation principles should be applied to all historic properties in Aspen, in order to preserve a historic building while retaining its defining characteristics and architectural integrity.

• Respect the historic design character of the building.

Don't try to change a building's style or make it look older than it really is. Confusing the character by mixing elements of different styles compromises integrity.

•Protect and maintain significant features and stylistic elements.

Distinctive stylistic features or examples of skilled craftsmanship should be treated with sensitivity.The best preservation procedure is to maintain historic features from the outset so that intervention is not required. Protection includes the maintenance of historic material through treatments such as rust removal, caulking, removal of dirt, debris, and biological growth, limited paint removal and reapplication of paint.

•Preserve any existing original site features or original building materials and features.

Preserve original site features, such as grading, rock walls, etc. Avoid removing or altering original materials and features. Preserve original doors, windows, porches and other architectural features.

•Repair deteriorated historic features, and replace only those elements that cannot be repaired.

Use recognized preservation methods. If disassembly is necessary for repair or restoration, provide detailed documentation through photographs and scaled drawings of existing original materials. Use methods that minimize damage to original materials and replace the existing configuration.

2. Planning a Historic Rehabilitation Project

Before You Start... The following checklist suggests a typical process for evaluating and assessing an historic building prior to undertaking rehabilitation work. Proper research and planning will lead to a more efficient, cost-effective rehabilitation and help maintain the historic integrity of the building.

Assess Architectural Integrity & Physical Condition

Answer the following questions:

- As an architectural system, has the building been assessed? This includes its plan, features, materials, finishes and structural system.
- Are there physical problems that threaten the buildings architectural and structural integrity?
- Has a structural survey determined any deficiencies due to settlement, deflection of beams, altered structural members or acute damage?
- Is there inherent material damage, such as material failure due to poor design, poor quality materials, severe environmental damage, neglect or improper maintenance?
- Is there human inflicted damage, such as removed or lost ornamentation, inappropriate coatings, or improper cleaning procedures?
- Are historic features hidden behind later alterations?
- Will the repairs solve the problem long term?

Documentation

- Photograph both the interior and exterior of the building thoroughly to document existing conditions prior to any construction work. Note the location and date of photos.
- Plan for materials testing to determine the conditions of materials or systems. For example: paint finish analysis, mortar analysis, and masonry load capacities. This is generally performed by an architectural conservator or structural engineering firm that has experience with older buildings.

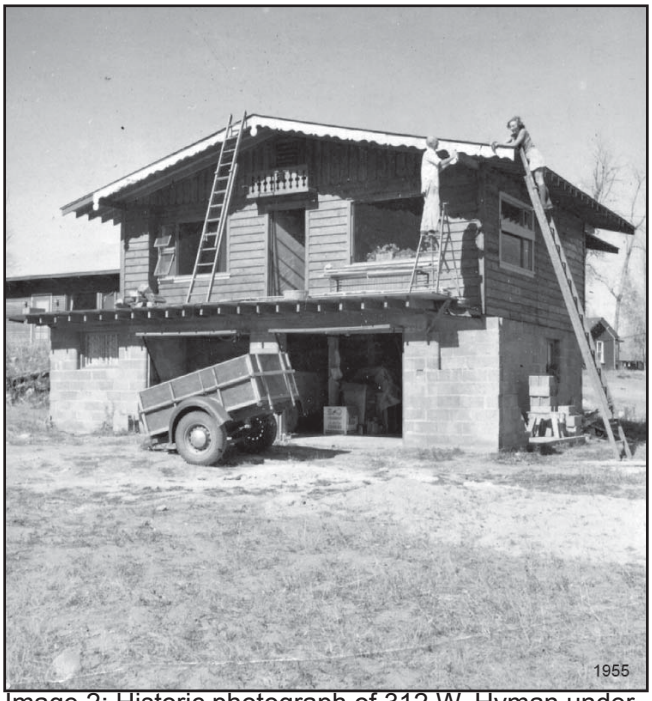

Image 2: Historic photograph of 312 W. Hyman under construction in 1955.

Permits, Contracts and Plans

- Provide a copy of all plans and rehabilitation procedures to the HPC for review and approval.
- Obtain and post all required building permits on the site, including HPC conditions of approval.
- Provide all subcontractors with a copy of the plans approved by the HPC, along with the conditions of approval.
- Adapt conditions of approval and historic rehabilitation specifications to all contract specifications. Any changes to the approved exterior elevations or site plan must receive approval before work. Call Aspen Historic Preservation staff at 920-5090 for more information.

Personnel

- If the project requires specialized crafts, such as stone carving or wood consolidation, organize experienced professionals with the necessary expertise.
- Retain an architect or other qualified historic preservation consultant to be on site during construction to

ensure that work is carried out according to established preservation pricinples. This item shall be included in contract specifications.

• Construction personnel should be trained to understand the conditions of approved work and appropriately treat historic materials.

On-Site Procedures

• Take measures to protect all historic fabric, as well as completed construction. (These procedures shall be included in the contract specifications.)

• Photograph, mark and store materials that must be removed from the building in such a manner that they are stored in a secure environment that will not cause any damage to the materials. In the future they can be reinstalled in an accurate, efficient manner.

• Propose all “in the field” changes to Historic Preservation staff for review prior to actually commencing work. Failure to do so can lead to a stop-of-work order and/or financial penalties.

Image 4: The Cortina Lodge with site protection fencing while it is being rehabilitated.

Protection of Site, Materials & Features

Any construction project involves planned procedures to protect completed work and works-in-progress. Work on an historic building requires the same amount of care. In many cases, additional steps are needed to prevent the building, its features and the surrounding site from negative effects during the rehabilitation process.

Protection methods should be planned and designed in such a way that they are durable for an extended period of time and do not damage any surfaces in their construction or attachment mechanisms. Documentation prior to commencement of work is critical to this process, as well as good preservation principle.

3. Conservation of Historic Materials

Introduction

In Aspen, wood siding and brick were the typical primary exterior building materials. Stone and log were also used, but log frequently was clad with clapboard siding. Wood siding occurred in a variety of forms but painted, horizontal clapboard was the most popular. AspenModern landmarks may be concrete block, moss rock, or feature more significant areas of glass.

In each case, the distinct characteristics of the primary building material (e.g. the scale of the material unit, its texture and finish) contribute to the historic character of a building. In a brick wall, for example, the particular size and color of brick used and the manner in which it was laid was distinct. In early masonry buildings, a soft mortar was used, which employed a high ratio of lime and little, if any, Portland cement. This soft mortar was laid in thin 'butter joints'. The size of the bricks contributed to the sense of scale of the wall, as did the texture and color of the mortar joints. When repointing such walls, it is important to use a mortar mix that approximates the original. Many contemporary mortars are harder in composition than those used historically. These should not be used in mortar repairs because this stronger material is often more durable than the brick itself. As a result, the newer mortar is too strong for the older brick, causing it to break off during movement or swelling. When the wall shifts during normal changes in temperature, the brick units themselves can be damaged and spalling can occur.

The best way to preserve historic building materials is through well-planned maintenance.

Wood surfaces should be protected with a good application of paint or stain.

Masonry should be kept dry by preventing leaks from the roof washing over the surface and by maintaining positive drainage away from foundations. Diverting water away from masonry will prevent capillary action-which is ground water leaking into masonry walls causing deterioration.

Horizontal surfaces such as chimneys, sills, and parapet copings are most likely to show the most deterioration because they are more exposed to weather and are more likely to hold water for longer periods than vertical surfaces. When deterioration occurs, determine where the water source is, develop a long term solution to resolve the water drainage, and repair the material. Frequently, damaged materials can be patched, reinforced, or consolidated.

In other situations, however, some portions of the material may be beyond repair. In such a case, consider replacement. In the case of primary historic building materials, the new material should match the original. If wood siding had been used historically, for example, the replacement also should be wood.

Image 5: Working on the Hotel Jerome brick restoration project. Note the size and color of brick and consistency of the mortar application.

It is important, however, that the extent of replacement materials be minimized, because the original materials contribute to the authenticity of the property as a historic resource. Even when the replacement material exactly matches that of the original, the integrity of a historic building is to some extent compromised when extensive amounts are removed. This is because the original material exhibits a record of the labor and craftsmanship of an earlier time.

It is important to recognize that all materials weather over time and that a scarred finish does not represent an inferior material, but simply reflects the age of the building. Preserving original materials that show signs of wear is therefore preferred to their replacement. Historic Preservation staff must be consulted, and approval must be granted, prior to replacement of any historic material.

Masonry Conservation

Masonry construction is one of the oldest and most enduring of construction types in Aspen. Its maintenance, preservation and rehabilitation also tends to be one of the most complex. Many of the traditional masonry skills have been lost in the trades, creating a problem in the rehabilitation process due to worker's unfamiliarity with older materials and techniques.

The characteristics of a masonry wall are:

- Masonry type
- Bonding pattern
- Mortar type and profile
- Color
- Texture
- Detailing

Together these features create the unique characteristics of a wall, and all are equally important in the preservation of masonry aesthetics to maintain historic integrity.

Image 6: Rear brick wall of the Red Onion. Note the different brick and mortar patches.

It should be understood that if deterioration is minimal, it is preferable to leave the masonry alone, as long as the problem does not threaten the integrity of the building or detract from the architectural character.

Common Problems, Causes & Solutions

Chipping: Chipping is when small pieces of masonry separate from the main stone or brick.

Causes: Later addition of too hard a mortar in nearby joints; accident.

Possible solutions:

- **It is best to leave the damaged area alone if it is located in an inconspicuous location and does not have the potential to cause further damage**

- **Place a dutchman (a fill-in piece) of natural stone or a precast imitation for limited replacement**. This new unit should be carefully designed to meet all specifications in the General Principles for Masonry Conservation.

- **Patch selected areas of broken stone with water based epoxy.** This produces a thermosetting resin which makes a tough, hard coating with excellent adhesion.

- **Fill small areas of missing stone with composite patches**. Mixes vary according to type of masonry, but should always be weaker than the masonry and meet other specifications in the Summary for Masonry Conservation. Patches should match the original in color, texture and surface tooling.

- **Strengthen masonry with consolidation procedures.** This method is only appropriate when the masonry is spalling, in addition to chipping. This involves the application of an inorganic substance, chemically curable monomer or clear silicone polymer. Limited penetration of these consolidant methods provides only marginal long-term treatment.

Cracking: Cracking is narrow fissures from 1/16 inch to 1/2 inch wide in a block of masonry.

Causes: Settling of a building; too hard of a mortar; inherent characteristic of the masonry itself; water damage; freeze thaw.

Possible Solutions:

- **Determine the cause of the problem**. Cracking may be structural or just a surface condition. It is recommended that a specialist be consulted to determine the cause of the cracking and offer solutions.

Spalling and Exfoliation: Spalling is a condition when the outer layers begin to break off or peel away from larger blocks of masonry.

Causes: The pressure of salts and freeze-thaw cycles of moisture trapped under the surface (subflorescence); too hard a mortar in repointing applications; improper cleaning techniques, especially abrasive methods, which may remove protective layers of brick or stone, thereby allowing water to penetrate and accelerate deterioration.

Possible solutions:

- **Determine the cause of the problem**. Eliminate the cause. For example: excess moisture in walls due to poor drainage, flashing failure, roof leaks, poor design, back splash from the ground.

- **Fill small areas of missing stone with composite patches**. Mixes vary according to type of masonry, but they should always be weaker than the masonry, have a compatible rate of thermal expansion, and meet other specifications in Guidelines for Masonry Rehabilitation. Patches should match in color, texture and surface tooling.

Rising Damp: Rising damp is the suction of ground water into the base of masonry walls through capillary action.

Causes: Moisture is drawn up into the walls and released at the interior and exterior surfaces; the moisture often contains salts which can lead to further surface deterioration—often due to improper drainage.

Possible solutions:

- **Use a poultice to draw out salts and debris from the masonry.** This should occur before consolidation and is typically used on sound masonry. Leaching out salts, moisture and harmful debris slows down the rate of deterioration.

- I**nstall a horizontal layer of material that is impervious to water.** This prevents the rising capillary action of ground moisture. First, all avenues should be explored to create positive drainage away from the historic material, and reduce ground moisture that may be caused by roof drainage, landscaping or grading problems.

Weathering: Weathering is the natural disintegration or erosion of stone characterized by rounded surfaces. Weathering often occurs in areas of acid rain and is common to sandstones and limestones.

Causes: Wind; rain; snow.

Possible solutions:

- **Develop positive drainage systems.**

- **Develop a regular maintenance plan for the building.**

Mortar Failure: Mortar failure is the crumbling and deterioration of mortar strength, depth and profile.

Causes: Naturally occurs with weathering; abrasive cleaning; chemical deterioration; excessive soiling.

Possible solutions:

- **Develop positive drainage systems.**

- **Develop a regular maintenance plan for the building.**

- **Repoint mortar joints.**

Repointing Mortar Joints

Mortar is a sacrificial material intended to deteriorate before the masonry. Repointing is the process of removing deteriorated mortar with hand tools and replacing the deteriorated mortar with new mortar. This is the most common masonry rehabilitation technique and should be thought of as regular long-term maintenance. In addition, this is frequently overlooked and performed with inappropriate materials and techniques which result in decreased aesthetics and accelerated masonry failure. Regular maintenance of roof materials, flashing, and damaged surfaces can prevent water infiltration and prolong the life of the mortar.

Using modern mortar between old bricks can be a recipe for disaster. Contemporary mortars are different in composition, strength, and color than historic mortars due primarily to the introduction of portland cement in the United States in the early 20th Century. Prior to the use of Portland cement in mortars, hydrated or slaked lime mixed with sand was the primary mortar composition. This mortar was of a softer composition and served as a sacrificial layer, allowing for expansion in the masonry and adequate permeability to wick moisture from the masonry itself. The mortar joint in historic buildings was often considered the walls first line of defense.

The introduction of portland cement to older buildings has created a situation whereby the masonry itself becomes the sacrificial layer as moisture is trapped in the masonry, making it susceptible to expansion and freeze-thaw cycles. Any expansion is absorbed by the masonry itself, but often is unable to do so. This leads to failure in the form of cracking, spalling and exfoliation.

Follow these steps:

Step 1. Identify the Historic Mortar Type

If the building was built prior to 1900, it likely used a lime mortar. Those buildings built after 1900, need more careful examination to determine mortar composition. A sample test should be performed to determine mortar type.

The types of mortar include:

- Lime Mortar—generally has a pure white appearance (although white portland cement can be deceiving). Lime mortar will crumble under pressure between the fingers. Lime mortar will break down in a water or vinegar- and-lime solution.

- Lime/Portland Cement Mix—is a grayish color and will not crumble under hand pressure, but will crumble under a slight hammer tap. In a water-and-vinegar solution only a partial separation will occur. Remember: color alone is not an indicator, due to tinting agents which may have been added.

- Portland Cement Mortar—will break under a hammer, butt ends to fracture and not crumble. It will not break down in a water-and-vinegar solution.

For conclusive results and accurate mortar reproduction, a sample mortar should be analyzed in a materials laboratory where it can be sampled for composition, aggregate mixture, bonding agents, porosity, color, and strength.

Step 2. Reproduce Mortar

In creating a repointing mortar that is compatible with the masonry units, the objective is to achieve one that matches the historic mortar as closely as possible, so that the new material can coexist with the old. The following criteria are guidelines for proper mortar reproduction:

• The new mortar shall match the historic in color, texture and tooling—basic aesthetic components.

• The aggregate must match the historic mortar, since this will determine the mortars color and texture.

• The new mortar must have greater vapor permeability and be softer in compressive strength than the masonry units.

• The new mortar must be as vapor permeable and as soft or softer in compressive strength than the historic mortar.

Step 3. Create Test Panels

Creating test panels should follow the same procedures as outlined in the Cleaning section of this document, and generally should occur in the same location of the building. A general contractor may want to require test panels as part of the mason contractor selection process to determine the mason's ability to accurately reproduce historic mortars and detailing. City Preservation Staff must review test panels.

Step 4. Prepare the Joint

The traditional manner of removing mortar is through the use of hand chisels. This provides the best final product due to minimal damage to the masonry units. The use of power saws and/or pneumatically- powered chisels should be avoided. Without careful use they will irreversibly damage the masonry units. Proficiency should be determined before these methods are approved.

Step 5. Fill the Joint

Repointing shall maintain the same visual qualities as the historic pointing styles. Pointing styles may vary throughout a building. Wide joints that lap over the arris of the brick are indicators of poor workmanship and detract significantly from the rehabilitation.

Summary for Masonry Conservation

Protecting and Maintaining Masonry

Permitted

• Identify, retain and preserve masonry features that are important in defining the overall historic character of the building (such as walls, brackets, railings, cornices, window surrounds, steps, columns) and details (such as tooling and bonding patterns, coatings and color).

• Protect and maintain masonry by providing proper drainage, do not allow water to stand on flat surfaces.

• Remove paint from masonry that was not historically painted.

Not Permitted

• Removing or radically changing masonry features which are important in defining the overall historic character of the building.

• Replacing or rebuilding a major portion of exterior masonry walls that could be repaired, so that the building is essentially new construction.

• Applying paint or other coatings to masonry that has been historically unpainted or uncoated.

• Removing paint from historically painted masonry.

• Failing to evaluate the causes of mortar joint deterioration such as leaking roofs, gutters, capillary action or extreme weather exposure.

Repointing Mortar Joints

Permitted

• Repair masonry walls and features by repointing mortar joints where there is evidence of deterioration.

• Remove mortar by carefully hand raking joints.

• Duplicate old mortar in strength, composition, color and texture.

• Duplicate old mortar joints in width and profile.

Not Permitted

• Removing non-deteriorated mortar to create a uniform appearance with all new repointing.

• Repointing with mortar of high portland cement content, unless it is the content of the historic mortar. This is a common cause of accelerated deterioration due to differing expansion coefficients, porosity of the mortar and masonry material.

• Changing width or profile of repointing.

Repairing Masonry Features

Permitted

• Repair masonry features by patching, piecing in, or consolidating the masonry using recognized preservation methods, after addressing the cause of the deterioration. Repair may include the limited use of compatible substitute materials.

• Replace missing historic features with accurate restoration using adequate historical documentation or a new design that is compatible in size, scale, material, and color.

Not Permitted

• Replacing entire masonry features when only portions require repair.

• Using substitute materials that do not convey the visual appearance of the surviving parts, or that are physically or chemically incompatible.

• Creating a false historical appearance based on insufficient information, or introducing a new feature that is incompatible in size, scale, material or color.

Cleaning Masonry

Permitted

• Clean masonry only when necessary to remove heavy soiling.

• Carry out masonry cleaning processes after thorough testing has been performed to confirm long range results of the gentlest means possible.

• Clean masonry surfaces with the gentlest means possible such as with low pressure water

• Remove paint with the gentlest means possible (i.e. hand scraping).

Not Permitted

• Cleaning masonry surfaces without sufficient testing or sufficient time to observe final results.

• Sandblasting brick or stone surfaces using dry or wet grit abrasives.This permanently erodes the surfaces and accelerates deterioration.

• Using cleaning methods that involve water or chemical solutions when there is a possibility of freezing temperatures.

• Cleaning with harsh chemical products that will damage masonry.

• Using high pressure water cleaning that will damage the mortar joints.

• Cleaning masonry surfaces when the soiling is not damaging, for the purpose of creating a new “clean” appearance.

• Removing paint with potentially destructive methods such as sandblasting, caustic chemicals, or high-pressure water blasting.

Wood Conservation

Historically, wood was one of the most frequently used construction materials. Many of the historic residences and commercial facades in Aspen were constructed with high quality wood, often employing enduring joinery and high quality craftsmanship. Wood provided an excellent medium for carpenters to express their talents and creativity. Preserving these features is fundamental to retaining the historic character of the commercial and residential districts and landmarks in and around Aspen.

Evaluation and Analysis of Wood Conservation Problems

Paint or Stain Failure: Coating failure is one of the most common problems leading to wood deterioration. Often coating failure is a result of moisture problems, or incompatible layers of finish coats. Any signs of coating failure should be signals of likely wood deterioration and the need to assess moisture problems.

Decay: Decay is usually in the form of brown rot or white rot. Excess moisture in the wood fosters an environment for fungi, the cause of decay.

Failure of Fastenings: Failure of fastenings occurs when ferrous metals rust extensively and are no longer able to support the required load.

Checking, Splitting and Sheared Members: Wood will naturally check over time, particularly when drying. Rapid drying can promote excessive checking and diminish the structural integrity of members. In older buildings, excessive stresses have often been placed upon timbers due to later structural alterations. Excessive forces for an extended time can shear structural members.

Insect Infestation: Insect infestation poses significant danger to historic wood buildings because by the time signs are apparent, considerable damage has already been done. The following evidence may indicate insect infestation: bore dust, excretia, debris and tunnels. Often the interior of the member contains the most damage and the exterior can be deceptively fine.

Basics of Wood Conservation

- Remove the source(s) causing the deterioration. Examples include a leaking roof, failed gutters, poor interior ventilation, overload- ing.
- Make all efforts to retain original work and disturb it as little as possible.
- Repair it in such a manner that the original aesthetic effect is not impaired.
- Pay attention to the effect of heavy exterior work upon the interior of a building.
- Avoid altering the balance of stresses without careful structural engineering.
- Approach straightening of structures carefully, and consider merely securing and stabilizing.
- Investigate all options to repair wood features prior to replacement.
- Partial or complete replacement should be in-kind and match the existing feature in the following criteria: species, cut type, color, tooling, finish.

Technical Options

Appropriate options should be chosen to conserve wood features in historic building to meet the Guidelines and Principles outlined on the previous pages. Too often wood features are removed in haste and replaced with inappropriate and incompatible substitutes. Increased familiarity with the technical options available (from simple detail repair to complex structural member repair) promotes higher quality rehabilitation by retaining the original building fabric.

Structural Repair

- **Reinforce wood members** with dowels or pegs of wood, metal or fiber glass. Timbers can be splinted with new timbers, structural steel and screwing. Tenons can be replaced and severely checked timber can be stabilized.

- **Fill missing areas** with a variety of methods including: wood splicing, synthetic resins and wood dust and commercial epoxy fillers.

- **Strengthen old wood** after fungal or insect attack by impregnating the wood with a low viscosity synthetic resin—referred to as consolidation.

- **Combine systems of reinforcement** and consolidation in order to enable old timbers to retain their aesthetic quality, while continuing to carry loads and meet Building Code requirements.

- **The treatment of the historical construction methods must continue to preserve the integrity of the historic structure.** Example: If wall studs are old and not structurally sound "sister in" additional wood studs rather then replace them.

Image 7 & 8: Damaged wood porch railing with missing balustrade (top). Using historic photographs the original balustrade was recreated (bottom).

Repair of exterior features and details

Many of the same techniques used for structural repairs are appropriate for the exterior repair of wood features, such as:

- **Replace details in-kind** with wood of similar characteristics.

- **Consider substitute materials** when the original is not available, where the original is known to be susceptible to decay or where maintenance may be difficult (such as on a church steeple).

- **Consider substitute material only** if it is similar in composition, design, color, and texture to the original.

- **Take proper care in the removal** of features during construction to avoid any damage.

- **Evaluate the use of current building products and techniques for longer durability**. For example-stainless steel fasteners, high quality caulking compounds, back priming boards and details, decay resistant woods and quality joinery.

Summary for Wood Conservation

Retain and Preserve Wood Features

Permitted

- Identify, retain and preserve wood features that are important in defining the overall historic character of the building such as: siding, cornices, brackets, window surrounds, doorway surrounds, and their paints and finishes.

Not Permitted

- Removing or radically altering wood features that are important in defining the overall historic character of the building.

- Removing a major portion of the historic wood feature instead of repairing or replacing only the deteriorated wood feature.

- Radically changing the historic type of finish, its color

or accent scheme so that the historic character of the exterior is diminished.

• Stripping historic surfaces to bare wood, then applying clear finishes to create a 'natural' look.

Protect Wood Features

Permitted

• Protect and maintain wood features by maintaining proper drainage so that water does not stand on flat surfaces.

• Inspect wood surfaces to determine if painting or cleaning is all that is required.

Not Permitted

• Failing to identify the causes of wood deterioration prior to cosmetic treatments.

Remove Paint

Permitted

• Remove paint to the next sound layer using the gentlest means possible, then repaint.

• Use chemical strippers to supplement other methods of paint removal. Detachable wood elements can be chemically dip-stripped when necessary.

Not Permitted

• Removing paint that is firmly adhering to, thus protecting wood surfaces.

• Using destructive paint removal methods such as open flame, sandblasting or water blasting. These can irreversibly damage historic woodwork.

• Failing to neutralize the wood thoroughly after using chemical strippers.

• Allowing chemical strippers to raise the grain surface features.

Repair Wood Features

Permitted

• Repair wood features by patching, piecing-in, consolidating or otherwise reinforcing the wood with proven preservation methods. Repair may also include limited replacement in- kind, or with compatible substitute materials.

• Replace in-kind an entire wood feature that is too deteriorated to repair, if the overall form and detailing are still evident, using the physical evidence to reproduce the feature. If using the same material is not technically or economically feasible, then a compatible substitute material may be considered.

• Design and install missing historic features based upon accurate restoration using historical research or a new design that is compatible in size, scale, material and color of the historic building.

Not Permitted

• Replacing an entire wood feature such as a cornice or wall when repair or limited replacement is feasible.

• Removing an entire wood feature and not replacing it, or replacing it with a new feature that does not convey the same visual appearance.

• Creating a false historical appearance because the replaced feature is based upon insufficient historical documentation, or creating a new appearance that is incompatible in size, scale, material or color.

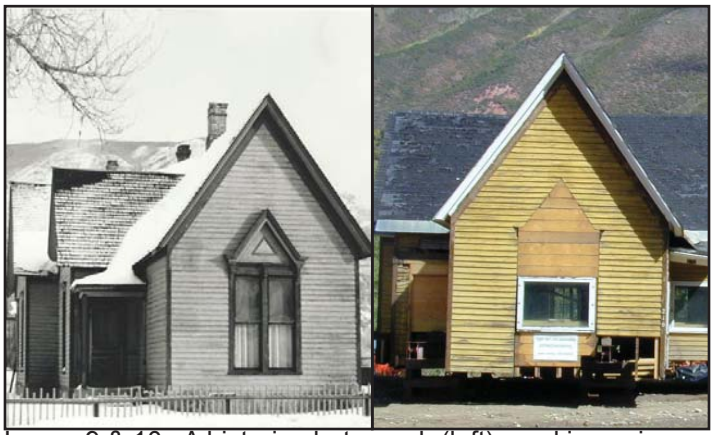

Image 9 & 10: A historic photograph (left) used in conjunction with ghost lines on the residence (right) to restore wood details and openings.

Exterior Cleaning of Buildings

Sometimes the most well-intentioned actions can be the most detrimental to historic buildings. Although cleaning buildings should be a regular part of maintenance, this procedure is often excluded for long periods of time. The initial impulse in the rehabilitation process is often to remove decades and even centuries of accumulated soil. Appropriate rehabilitation procedures should aim to clean the building of all harmful soiling; however, they should NOT aim to create a new looking building. A limited amount of soiling tells the story of a building and creates a characteristic patina.

Abrasive cleaning methods are responsible for causing a great deal of harm to historic building materials. A thorough understanding of historic building materials and cleaning procedures is required to prevent irreversible aesthetic and physical damage to building features.

- All cleaning methods must be undertaken with the gentlest means possible.
- All cleaning methods must be spot tested in a discrete, representative area before applying the procedure to the entire building. However, this should be done in an inconspicuous location. (e.g. lower brick courses in rear of house, NOT next to the front door).
- All tested procedures should only be evaluated after they have had ample time to demonstrate final results.
- Abrasive cleaning methods such as sandblasting, are inappropriate since they tend to erode surface materials and accelerate further deterioration in building materials.
- Gentler means of cleaning may include low- pressure water washes, varying water temperatures, or scrubbing areas with a natural bristle brush (never metal).

Certain chemical cleaners with proper application can be effective; however, these should be evaluated only after representative test-patches have been performed in an appropriate location.

Often, a combination of procedures and materials is required to reach a desirable outcome while still using the gentlest means possible. There is no one formula that will be suitable for cleaning all buildings.

4. Window Conservation

Introduction

Windows are some of the most important character-defining features of historic structures. They give scale to buildings and provide visual interest to the composition of individual facades. Distinct window designs help define many historic building styles. For example, some historic windows have deeply recessed openings and carved sash components that create a significant three-dimensional characteristic. This type of character defining historic feature is important to preserve. Because windows so significantly affect the character of a historic structure, the treatment of a historic window and the design of a replacement, when necessary, are very important considerations.

Deterioration of Historic Windows

Properly maintained, original windows will provide excellent service for years to come. Most problems that occur result from a lack of maintenance. For example, the accumulation of layers of paint on a wood sash may make operation difficult. Using proper painting techniques, such as removing upper paint layers and preparing a proper substrate, can solve this problem.

Water damage and the ultra violet degradation caused by sunlight are major concerns. Paint generally serves as a protective barrier between the window substrate material and damaging environmental elements such as sunlight and water. When paint is chipping or cracked, it can potentially expose the window substrate to harmful elements that will increase the rate of deterioration. In most cases, windows are not susceptible to damage if an uninterrupted coat of paint is maintained.

Repair of Historic Windows

In most cases, it is easier and more economical to repair an existing window rather than to replace it, in large part because newer windows have a shorter shelf life than historic windows and in many instances custom size windows are required for historic buildings, which is much more costly to be manufactured than repairing an existing window.

Image 11: Badly damaged historic window in need of new glazing and wood repair.

Replacing a historic window with an exact duplicate decreases the authenticity of the historic resource and typically uses more energy than a repair. Replacement should be performed as a last resort. When considering whether to repair or replace a historic window, consider the following:

Step 1. Determine the window's architectural significance.

Is it a key character-defining element of the building? Typically, windows on the front of the building and on sides designed to be visible from the street, are key character-defining elements. A window in an obscure location or on the rear of a structure may not be as significant. Greater flexibility in the treatment or replacement of such secondary windows may be considered.

Step 2. Inspect the window to determine its condition.

Distinguish superficial signs of deterioration from actual failure of window components. Peeling paint and dried wood, for example, are serious problems, but often do not indicate that a window is beyond repair. What constitutes a deteriorated window? A rotted sill may dictate its replacement, but it does not indicate the need for an entirely new window. Determining window condition must occur on a case-by-case basis.

Step 3. Determine the appropriate treatment for the window.

Surfaces may require cleaning and patching. Some components may be deteriorated beyond repair. Patching and splicing-in new material for only those portions that are decayed should be considered in such a case, rather than replacing the entire window. If the entire window must be replaced, the new one should match the original in appearance. (See “Replacement Windows” in the following section.)

Energy Conservation

In some cases, owners may be concerned that an older window is less efficient in terms of energy conservation. In fact, most heat loss is associated with air leakage though gaps in an older window that are the result of a lack of maintenance, rather than loss of energy through the single pane of glass found in historic windows. The glazing compound may be cracked or missing, allowing air to move around the glass. Sash members also may have shifted, leaving a gap for heat loss.

Weather stripping and storm windows have been demonstrated through multiple energy efficiency studied to be extremely effective and affordable methods that are comparable to new windows.

When considering the installation of storm windows, interior storm windows are the preferred approach because they generally do not adversely affect the exterior of a building; however, exterior storm windows are appropriate in specific cases.

A storm panel should be designed to match the historic window divisions such that the exterior appearance of the original window is not obscured.

Replacement Windows

While replacing an entire window assembly is discouraged, it may be necessary in some cases.

Step 1. Replace a window to match the appearance of the original to the greatest extent possible.

While replacing an entire window assembly is discouraged, it may be necessary in some cases. To do so, the size and proportion of window elements, including glass and sash components, should match the original. In most cases, the original profile, or outline of the sash components, should be the same as the original. At a minimum, the replacement components should match the original in dimension and profile, and the original depth of the window jamb should be maintained.

Step 2. Use the same material as the original window.

A frequent concern is the material of the replacement window. While wood was most often used historically, metal and vinyl-clad windows are common on the market today and sometimes are suggested as replacement options by window suppliers. If the historic window was wood, then using a wood replacement is the best approach.

Step 3. Preserve the original casing when feasible.

This trim element often conveys distinctive stylistic features associated with the historic building style and may be costly to reproduce. Many good window manufacturers today provide replacement windows that will fit exactly within historic window casings.

5. Porch Conservation

Introduction

Historically, porches have been popular features in residential design. A porch protects an entrance from snow and provides shade in the summer. It also provides a sense of scale and aesthetic quality to the façade of a building. A porch catches breezes in the warmer months, while providing a space for residents to sit and congregate. Finally, a porch often connects a house to its context by orienting the entrance to the street.

Porch Deterioration

Because of constant exposure to sun and rain and the fact that a porch is open to the elements, it decays faster than other portions of a house. Rainwater draining off the main house onto the porch largely contributes to deterioration. It is important to create positive drainage that directs water away from the porch, paying special attention to the foundation.

Common causes of moisture problems:

Exterior—leaking roof, leaking gutters, insufficient caulking, improper flashing, landscaping.

Interior—poor interior ventilation, improperly insulated walls.

Always fix moisture problems prior to any surface treatments.

One type of damage typical to foundations is rising damp—a condition in which masonry absorbs water from the ground up, and begins to decay. Other problems include weathering of features such as posts, columns, steps and decorative detailing. Peeling paint is a common symptom. In some cases the porch itself may experience sagging or detachment from the house due to settling of the house or the porch.

Repair of Porches

After discovering structural or cosmetic problems with a porch, one should begin to formulate a strategy for its treatment. The most sensitive strategy is to repair the porch. This treatment is preferred, rather than replacing the porch altogether. In most cases it is in fact easier, and more economical, to repair an existing porch or porch elements, rather than to replace them. This approach is preferred because the original materials of a porch contribute to the historic character of the building. Even when replaced with an exact duplicate porch, a portion of the historic building fabric is lost. Therefore, such treatment should be avoided whenever possible.

Image 12: Historic side porch with water damage and sturctural deterioration.

Reconstructing a Missing Porch

Before developing a plan for reconstructing a missing porch one should search for: 1) written documentation of the original porch in the form of historic photographs, sketches and/or house plans; 2) physical evidence of the original porch, including ghost lines on walls that indicate the outline of the porch and/or holes on the exterior wall that indicate where the porch may have been attached to the front facade; 3) examples of other houses of the same period and style that may provide clues about the design and location of the original porch. Approval is required before undertaking this work.

6. Roof Conservation

Introduction

Although the function of a roof is to protect a building from the elements, it also contributes to the overall character of the building. When repeated along the street, similar roof forms contribute to a sense of visual continuity for the neighborhood. In each case, the roof pitch, its materials, size and orientation are all distinct features.

Historically the roof shape was dictated by climatic considerations, which determined roof forms and pitch. Aspen has seen the construction of various roof forms.

Roof Deterioration

The roof is the structure's main defense against the elements. However, all components of the roofing system are vulnerable to leaking and damage. When the roof begins to experience failure, many other parts of the building may also be affected. For example a leak in the roof may lead to damage of attic rafters or even wall surfaces.

Common sources of roof leaks include:

- Cracks in chimney masonry
- Loose flashing around chimneys and ridges
- Loose or missing roof shingles
- Cracks in roof membranes caused by se tling rafters
- Water backup from plugged gutters or moss accumulation on shingles

Repairing a Historic Roof

In repairing or altering a historic roof it is important to preserve its historic character. For instance, one should not alter the pitch of the historic roof, the perceived line of the roof from the street, or the orientation of the roof to the street. The historic depth or overhang of the eaves, which is often based on the style of the house, should also be preserved.

Follow these steps:

Step 1. Avoid removing historic roofing materials that are in good condition.

Where replacement is necessary, such as when the historic roofing material fails to properly drain or is deteriorated beyond use, one should use a material that is similar to the original in style and texture. The overall pattern of the roofing material also determines whether or not certain materials are appropriate. For instance, cedar and asphalt shingles have a uniform texture, while standing-seam metal roofs have a ribbed pattern.

Step 2. Match the color of the historic roof material.

Wood and asphalt shingles are appropriate replacement materials for many roofs. Only fire retardant wood shingles are allowed in Aspen. Original metal or membrane roofs appear on some designated buildings.

Step 3. Do not use roof materials that would not have been typical or original to the building.

Use existing material or historic documentation such as photographs to determine original material.

Image 13: Ice damming on a historic roof.

7. Historic Finishes

Introduction

Paint is a building's first layer of protection, beyond just being an aesthetic detail. Exterior woodwork and paint coverings need routine maintenance. Without question the most critical part of a quality paint job is proper surface preparation. Unless the surface is properly cleaned, dried, treated and primed, the paint will fail prematurely and this will often lead to building material deterioration.

It should be understood by a contractor and any subcontractor that a quality paint job on an historic building is going to involve much more than just painting. Clear documentation and contract specifications will show a more thorough understanding of what is required for a lasting paint job.

For large or complex finish jobs on historic buildings, sample patches should be employed and may be considered as part of the bidding procedure.

Maintaining Finishes

Following are the appropriate procedures for maintaining finishes on an historic building.

Follow these steps:

Step 1. Assess conditions

Moisture levels in a building surface are usually the result of a design defect or maintenance problem. Peeling and bubbling of paint, especially localized, are indicators of moisture problems. These moisture problems can be a result of either exterior conditions or interior conditions.

Step 2. Clean All Surfaces

Clean surfaces provide a better indication of the existing conditions, and are necessary for optimum paint adhesion.

Clean surfaces with the gentlest means possible and be sure any detergents are thoroughly rinsed. Be careful of power washing, which can damage details and substrates and potentially add more moisture to the surface and subsurface. Allow all surfaces to thoroughly dry.

Step 3. Remove deteriorated paint

There is no one best way to remove paint from a building and often numerous methods may need to be employed on different features on one building. Rarely does an entire surface need to be stripped and this practice should be avoided because it will generally damage wood. In the case of significant stripping, always leave an area unsanded as a 'historic window' to the building's finish history.

Traditional hand scraping, although labor intensive, tends to provide the best surface preparation while doing the least amount of damage.

The following methods of paint removal should be evaluated for their appropriateness:

Sanding

Pro—Provides smooth finish, clean substrate.

Con—Can damage surfaces, can expose hazardous dust and lead, exposes nailheads prone to rust.

Chemical strippers

Pro—Cost-effective for removal of thick build up or complex details.

Con—Potentially hazardous, very messy.

Heat tools

Pro—Properly used can remove thick layers with minimal substrate damage. Good for flat surfaces.

Con—Improperly used can scorch surfaces and introduce fire hazards.

Step 4. Prepare the surface

- Sand all scraped surfaces smooth.
- Fill voids with putty or wood.
- Treat exposed wood with conditioner to prolong the life of the wood and paint job. Natural or synthetic oils will enliven dried-out, weather-beaten wood.
- Treat decay-prone areas with water repellent-preservatives (WRP's).

Step 5. Prime the surface

The primer is an integral part of the paint system and should not be skipped. It provides a protective film on the wood and better surface adhesion for topcoats, which contain more pigment and less skin- making binder. Be sure that existing paint layers, new primer and new top coats are compatible. This might necessitate confirmation whether the existing top coats are oil- or latex-based.

- Caulk all gaps after priming with a high quality elastomeric compound that is paintable.
- Moisture levels in substrate should not exceed 14% when priming.

Step 6. Paint surfaces

Painting is a craft and needs to be approached methodically. Historic buildings require attention to detail, and proper planning. Site and building protection is fundamental to a good job. Paint drips on porch roofs, foundation walls and even landscaping are unacceptable on any quality paint job. Very clear specifications shall be included in the painting contract regarding such matters.

- Sand and dust all prime coat surfaces.
- Write clear specifications on the conditions under which painting will proceed, including temperature and moisture levels. Rushing to get the job done in marginal conditions will lead to premature paint failure.
- Clearly check manufacturer specifications on compatibility of products.

What are Historic Colors?

Historic paint colors and schemes varied throughout the 19th and 20th Century. Replication of exact paint colors dating back to a building's period of significance might not be the goal, or even desirable. It is possible to paint a building in appropriate historic colors, while still expressing individual taste. The City of Aspen does not regulate paint color.

Follow these steps:

Step 1. Investigate for the historic colors, if desired.

- Look at paint palettes from the building's period of significance.
- Look at "Historic Paint Palettes" by commercial paint companies, but be aware of different historic periods—what was appropriate for a historic Queen Anne is not appropriate for a 1950s Chalet.
- Physically investigate paint layers by removing a core sample with a scalpel from the wall. The sample must include a portion of the substrate wall material (plaster, etc.) to accurately illustrate the first layer of paint. The same procedure applies to material finishes.
- The best areas to investigate historic paint schemes are in inconspicuous places; for example: the intersection of wall and molding or hidden areas behind doors.
- Take a core sample all the way to the substrate and send to a conservation lab for analysis.
- Look at multiple areas to determine color and interior patterns/ decorative painting.

For more exact identification, chemical or laboratory analysis can be performed for a minimal cost by a preservation consultant or architectural conservator.

Step 2. Choose a color palette.

- Choose from among the period color cards of the building's era if desired, or consider colors that relate to the natural color schemes of the area—for example, many historic paints were based upon naturally occurring earth pigments.

- Consider practicality—the more elaborate the paint scheme, the more maintenance is required and the more apparent is surface degeneration.

- Isolate whimsical colors to accent areas and consider the context of the building.

- Consider how the paint scheme will fit into the community.

8. Relocating a Building

Foundations

Traditionally, most buildings in Aspen had simple foundation designs. Many had a wooden sill that was clad with siding. A few of the grander structures had stone foundations. These features should be preserved. However, even when a building is preserved in place, it is often necessary to rebuild the foundation. When doing so, it is important to convey the character of the original foundation. Foundation height and exposure above grade are important elements that need to be preserved. Original materials may need to be salvaged and reused.

Stablilization

Special care must be taken when preparing a building for relocation. In addition to protecting the site and any historic landscape features and trees prior to moving a building, wood panels should be mounted on the exterior of the building to protect existing openings and historic glass. Original door and window frames and sashes should be protected, and not damaged, when covering the openings. Original doors and other architectural features must be either stored safely onsite or secured to the building. All historic material that is removed to prepare for the relocation, siding for example, shall be stored and reused once the building is in its final location. Photographic documentation and dimensional measurements need to be recorded of existing conditions, for example chimney and foundation heights, prior to dismantling and moving the building.

Any temporary locations that may be needed to store the building while the site is prepared for the final location of the building need approval. Most temporary locations need to be within close proximity to the final location site.

Images 14 &15: Historic home getting prepared to be relocated (top). A detail of the original foundation and documentation of foundation exposure and style (bottom).

9. Historic Landscape Features

The character of historic structures is greatly influenced by the manner in which their sites are landscaped and streets are designed. At a block level, street pavings, trees, lights and other furnishings combine in streetscapes that are important considerations in the historic districts.

On individual sites, the arrangement of trees and shrubbery and the use of fences and lighting are important design elements. In some cases, these features have historic significance; in others, their designs are still important because they can affect one's ability to interpret the historic structures. Original features must be protected as shown on the approved building permit.

HPC reviews and approves landscape plans including plantings, site lighting and hardscape. The Engineering Department reviews landscape plans for compliance with storm water mitigation and grading requirements, and the Parks Department reviews landscape plans for tree removal permits and plantings in the right of way.

10. Additional Resources

Technical Publications

The following publications are produced by the National Park Service, Heritage Preservation Services, and are available online.

Preservation Briefs:

www.nps.gov/tps/how-to-preserve/briefs.htm

Published by the Preservation Assistance Division of the National Park Service. These are professional articles on procedures for rehabilitating historic structures according to federal standards.

1 Cleaning and Water-Repellent Treatments for Historic Masonry Buildings

2 Repointing Mortar Joints in Historic Masonry Buildings

3 Improving Energy Efficiency in Historic Buildings

4 Roofing for Historic Buildings

5 The Preservation of Historic Adobe Buildings

6 Dangers of Abrasive Cleaning to Historic Buildings

7 The Preservation of Historic Glazed Architectural Terra-Cotta

8 Aluminum and Vinyl Siding on Historic Buildings: The Appropriateness of Substitute Materials for Resurfacing Historic Wood Frame Buildings

9 The Repair of Historic Wooden Windows

10 Exterior Paint Problems on Historic Woodwork

11 Rehabilitating Historic Storefronts

12 The Preservation of Historic Pigmented Structural Glass (Vitrolite and Carrara Glass)

13 The Repair and Thermal Upgrading of Historic Steel Windows

14 New Exterior Additions to Historic Buildings: Preservation Concerns

15 Preservation of Historic Concrete

16 The Use of Substitute Materials on Historic Building Exteriors

17 Architectural Character—Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character

18 Rehabilitating Interiors in Historic Buildings — Identifying Character-Defining Elements

19 The Repair and Replacement of Historic Wooden Shingle Roofs

20 The Preservation of Historic Barns

21 Repairing Historic Flat Plaster—Walls and Ceilings

22 The Preservation and Repair of Historic Stucco

23 Preserving Historic Ornamental Plaster

24 Heating, Ventilating, and Cooling Historic Buildings: Problems and Recommended Approaches

25 The Preservation of Historic Signs

26 The Preservation and Repair of Historic Log Buildings

27 The Maintenance and Repair of Architectural Cast Iron

28 Painting Historic Interiors

29 The Repair, Replacement, and Maintenance of Historic Slate Roofs

30 The Preservation and Repair of Historic Clay Tile Roofs

31 Mothballing Historic Buildings

32 Making Historic Properties Accessible

33 The Preservation and Repair of Historic Stained and Leaded Glass

34 Applied Decoration for Historic Interiors: Preserving Historic Composition Ornament

35 Understanding Old Buildings: The Process of Architectural Investigation

36 Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes

37 Appropriate Methods of Reducing Lead-Paint Hazards in Historic Housing

38 Removing Graffiti from Historic Masonry

39 Holding the Line: Controlling Unwanted Moisture in Historic Buildings

40 Preserving Historic Ceramic Tile Floors

41 The Seismic Retrofit of Historic Buildings: Keeping Preservation in the Forefront

42 The Maintenance, Repair and Replacement of Historic Cast Stone

43 The Preparation and Use of Historic Structure Reports

44 The Use of Awnings on Historic Buildings: Repair, Replacement and New Design

45 Preserving Historic Wooden Porches

46 The Preservation and Reuse of Historic Gas Stations

47 Maintaining the Exterior of Small and Medium Size Historic Buildings

Preservation Tech Notes:

www.nps.gov/tps/how-to-preserve/tech-notes.htm

Published by the National Park Service, these are designed to provide practical information on techniques and practices for building and historic resource conservation.

Doors

1.Historic Garage and Carriage Doors: Rehabilitation Solutions. Bonnie Halda, AIA. 1989.

Exterior Woodwork

1.Proper Painting and Surface Preparation. Sharon Park, AIA. 1986.

2.Paint Removal from Wood Siding. Alan O'Bright. 1986.

3.Log Crown Repair and Selective Replacement Using Epoxy and Fiberglass Reinforcing Bars. Harrison Goodall. 1989.

4.Protecting Woodwork Against Decay Using Borate Preservatives. Ron Sheetz and Charles Fisher. 1993.

Finishes

1.Process-Painting Decals as a Substitute for Hand-Stencilled Ceiling Medallions. Sharon Park, FAIA. 1990.

Historic Glass

1.Repair and Reproduction of Prismatic Glass Transoms. Chad Randl. 2002.

2.Repair and Rehabilitation of Historic Sidewalk Vault Lights. Cas Stachelberg and Chad Randl. 2003.

Historic Interior Spaces

1.Preserving Historic Corridors in Open Office Plans. Christina Henry. 1985.

2.Preserving Historic Office Building Corridors. Thomas Keohan. 1989.

3.Preserving Historic Corridor Doors and Glazing in High-Rise Buildings. Chad Randl. 2001.

Masonry

1.Substitute Materials: Replacing Deteriorated Serpentine Stone with Pre-Cast Concrete. Robert M. Powers. 1988.

2.Stabilization and Repair of a Historic Terra Cotta Cornice. Jeffrey Levine and Donna Harris. 1991.

3.Water Soak Cleaning of Limestone. Robert M. Powers. 1992.

4.Non-destructive Evaluation Techniques for Masonry Construction. Marilyn E. Kaplan, Marie Ennis and Edmund P. Meade. 1997.

Mechanical Systems

1.Replicating Historic Elevator Enclosures. Marilyn Kaplan, AIA. 1989.

Metals

1.Conserving Outdoor Bronze Sculpture. Dennis Montagna. 1989.

2.Restoring Metal Roof Cornices. Richard Pieper. 1990.

3.In-kind Replacement of Historic Stamped-Metal Exterior Siding. Rebecca A. Shiffer. 1991.

4.Rehabilitating a Historic Iron Bridge. Joseph P. Saldibar, III. 1997.

5.Rehabilitating a Historic Truss Bridge Using a Fiber-Reinforced Plastic Deck. Chad Randl. 2003.

6.Repair and Reproduction of Metal Canopies and Marquees with Glass Pendants. Lauren Van Damme and Charles E. Fisher. 2006.

Museum Collections

1.Museum Collection Storage in a Historic Building Using a Prefabricated Structure. Don Cumberland, Jr. 1985.

2.Reducing Visible and Ultraviolet Light Damage to Interior Wood Finishes. Ron Sheetz and Charles Fisher. 1990.

Site

1.Restoring Vine Coverage to Historic Buildings. Karen Day. 1991.

Temporary Protection

1.Temporary Protection of Historic Stairways. Charles Fisher. 1985.

2.Specifying Temporary Protection of Historic Interiors During Construction and Repair. Dale H. Frens. 1993.

3.Protecting A Historic Structure during Adjacent Construction. Chad Randl. 2001.

Windows

Please note that 1–9 are available only in The Window Handbook: Successful Strategies for Rehabilitating Windows in Historic Buildings, which can be purchased through our partner, the Historic Preservation Education Foundation.

1.Planning Approaches to Window Preservation. Charles Fisher. 1984.

2.Installing Insulating Glass in Existing Steel Windows. Charles Fisher. 1984.

3.Exterior Storm Windows: Casement Design Wooden Storm Sash. Wayne Trissler and Charles Fisher. 1984.

4.Replacement Wooden Frames and Sash. William Feist. 1984.

5.Interior Metal Storm Windows. Laura Muckenfuss and Charles Fisher. 1984.

6.Replacement Wooden Sash and Frames With Insulating Glass and Integral Muntins. Charles Parrott. 1984.

7.Window Awnings. Laura Muckenfuss and Charles Fisher. 1984.

8.Thermal Retrofit of Historic Wooden Sash Using Interior Piggyback Storm Panels. Sharon Park, AIA. 1984.

9.Interior Storm Windows: Magnetic Seal. Charles Fisher. 1984.

10.Temporary Window Vents in Unoccupied Historic Buildings. Charles Fisher and Thomas Vitanza. 1985.

11.Installing Insulating Glass in Existing Wooden Sash Incorporating the Historic Glass. Charles Fisher. 1985.

12.Aluminum Replacements for Steel Industrial Sash. Charles E. Fisher. 1986.

13.Aluminum Replacement Windows with Sealed Insulating Glass and Trapezoidal Muntin Grids. Charles Parrott. 1985.

14.Reinforcing Deteriorated Wooden Windows. Paul Stumes, P.Eng 1986.

15.Interior Storms for Steel Casement Windows. Charles E. Fisher and Christina Henry. 1986.

16.Repairing and Upgrading Multi-Light Wooden Mill Windows. Christopher W. Closs. 1986.

17.Repair and Retrofitting Industrial Steel Windows. Robert M. Powers. 1989.

18.Aluminum Replacement Windows With True Divided Lights, Interior Piggyback Storm Panels, and Exposed Historic Wooden Frames. Charles Parrott. 1991

19.Repairing Steel Casement Windows. Chad Randl. 2002.

20.Aluminum Replacement Windows for Steel Projecting Units with True Divided Lights and Matching Profiles. Chad Randl. 2003.

21.Replacement Wood Sash Utilizing True Divided Lights and an Interior Piggyback Energy Panel. Charles E. Fisher. 2008.

22.Maintenance and Repair of Historic Aluminum Windows. Kaaren R. Staveteig. 2008.

On-Line Resources

American Institute for Conservation of Historic and Artistic Works: http://aic.stanford.edu

The Getty Conservation Institute:

www.getty.edu/conservation

National Park Service: www.cr.nps.gov

National Center for Preservation Technology:

www.ncptt.nps.gov

National Trust for Historic Preservation:

www.preservationnation.org

PreserveNet: www.preservnet.cornell.edu

Journals and Periodicals

APT Bulletin: www.apti.org Published Quarterly by the Association for Preservation Technology International, contains general articles and case studies for the conservation of historic structures.

CRM (Cultural Resource Magazine): www.cr.nps.gov/crm Published by the National Park Service and contains articles about building preservation and conservation.

Historic Preservation: www.preservationnation.org- Published by the National Trust for Historic Preservation, includes articles on the field of historic preservation, specific projects and organizations.

Old-House Journal: www.oldhousejournal.com Popular magazine primarily for private owners of older houses, contains technical articles and design ideas.

Traditional Building: www.traditional-building.com This subscription journal discusses and lists sources for preservation materials and services, applicable to preservation projects of all scales.

Professional Organizations

American Institute for Conservation/ Architecture Specialty Group: http://aic.stanford.edu

Association for Preservation Technology International: www. apti.org

Colorado Historical Society:

www.historycolorado.org

Colorado Preservation, Inc.:

www.coloradopreservation.org

Preservation Trades Network: www.ptn.org