



# CITY OF PORTSMOUTH

## Historic District Commission

### Guidelines for Exterior Maintenance



*Repainting should be considered as part of regular exterior maintenance as a means of protecting wood from exposure to the elements and moisture-related deterioration.*

These *Guidelines* were developed in conjunction with the City of Portsmouth's Historic District Commission (HDC) and the Planning Department. Please review this information during the early stages of planning a project. Familiarity with this material can assist in moving a project quickly through the approval process, saving applicants both time and money.

In its review, the HDC considers a property's classification, recommending the greatest historic authenticity at focal buildings, with more flexibility at contributing structures, and the most at non-contributing properties. The HDC Staff in the Planning Department is available to provide informal informational meetings with potential applicants who are considering improvements to their properties.

Additional *Guidelines* addressing other historic building topics are available at City Hall and on the Commission's website at [www.planportsmouth.com/historicdistrictcommission](http://www.planportsmouth.com/historicdistrictcommission). For more information, to clarify whether a proposed project requires HDC review, or to obtain permit applications, please call the Planning Department at (603) 610-7216.

#### EXTERIOR MAINTENANCE

The historic architecture of Portsmouth features a well-constructed building stock from the 17th to the mid-20th centuries. Many of these buildings serve residents today because they have been maintained by previous and present owners. These buildings can continue to evolve to suit the needs of future residents with continued attention and maintenance.

A building is typically a family's or business owner's largest single investment. One of the best ways to help a property retain its value is to implement a schedule of regular and preventive maintenance. Unlike the buyer of an automobile, a new homeowner is not provided with an operator's manual or warranty book outlining a recommended maintenance schedule. As a result, many homeowners do little or no regular maintenance or repair, leaving them unaware of potential issues until a serious problem develops.

#### BUILDING ENVELOPE DETERIORATION

The exterior envelope of a building is made up of various components that typically include roofing, walls, windows and doors. Each of these building components can be executed in various materials within the same building envelope, such as a combination of shingle roofing at sloped surfaces and rolled roofing at flat surfaces. These components of various materials act together as a system to protect the interior from exterior environmental extremes. Some of the environmental influences affecting the exterior building envelope include:

- Moisture, rain, snow, ice, humidity and groundwater
- Wind
- Sunlight
- Temperature variations
- Atmospheric chemicals and acid rain
- Insects, birds and rodents
- Vegetation, molds, algae and fungi

All building materials, new or old, will deteriorate over time. Each of the environmental influences listed above, individually and in combination, has the potential to react differently with the materials that comprise a building's exterior envelope and cause deterioration. The potential reactions are further complicated by the way the materials are installed and joined together, and their relative locations. However, by implementing a regular maintenance and repair program, the rate of deterioration can be dramatically slowed, allowing the City's historic buildings to last for centuries.

## MAINTENANCE IS GOOD PRESERVATION

Regular maintenance helps preserve buildings, structures and properties; helps protect real estate values and investments; and keeps Portsmouth an attractive place to live, work and visit. Lack of regular upkeep can damage these values and the building itself, resulting in accelerated deterioration of a building's or property's elements and features. Small openings or unpainted surfaces can allow moisture penetration and eventually rot. In the case of historic buildings, character defining elements can be difficult and costly to replace. In addition, long-term lack of maintenance can impact a building's structure, resulting in expensive repairs. (Refer to *Demolition-by-Neglect*, below.)

It is prudent for property owners to inspect their buildings and properties regularly to identify potential problems. If problems are detected early, smaller investments of money may not only improve a property's overall appearance and value, but can prevent or postpone extensive and costly future repairs. Regular maintenance items include painting and cleaning gutters and downspouts. It is prudent to inspect the roof for any signs of moisture infiltration, open joints, missing components, and cracks or bulges.



*Removal of the vinyl siding has exposed the underlying wood siding and prior repairs to the wood framing system. The structural condition of the wall should be evaluated prior to repairing the siding.*

## REPAIR VS. REPLACEMENT

One of the essential missions of the HDC is to protect and preserve historic properties for the benefit of future generations. This includes all exterior historic materials found within the district. **To preserve the authenticity of Portsmouth, the HDC strongly encourages the retention of historic materials or replacement in-kind whenever work on a property is considered.** Therefore, the HDC recommends repairs that are focused at specific areas of deterioration and that maintain a building's stability and weather resistance, rather than wholesale replacement of a historic building material. It is understood that additional care and attention might be required as part of the effort, but regular maintenance and timely repairs can minimize large repair costs associated with ongoing deterioration.



*Openings at the exterior of the building can provide access for pests, birds and rodents.*

## PREVENTIVE MAINTENANCE CHECKLISTS

These *Guidelines for Exterior Maintenance* include preventive maintenance checklists to assist property owners in recording the current condition of their buildings, as well as keeping track of maintenance tasks as they are performed. The checklists refer to typical problems associated with various materials and possible recommended actions. The checklist should be modified to address the specific materials found at each property. If a building has serious problems, a more detailed inspection can be performed by a qualified architect or structural engineer who can recommend an appropriate treatment approach.

It is recommended that owners conduct a minimum of two annual property reviews, before winter and in the early spring. The fall review will assist in identification of weatherization projects needed before winter and its associated snowfall, as well as identification of projects to be scheduled during the tourism low season and for the following year. The spring review will help identify work that should be completed during the warm weather months. Areas of deterioration or problems should be photographed during each inspection. Dating of photographs can help document an ongoing problem's progression and assist in planning future repairs. For more specific information regarding the various materials identified, please refer to the *Guidelines* sections available at the HDC office or on its web site at [www.planportsmouth.com/historicdistrictcommission](http://www.planportsmouth.com/historicdistrictcommission).

## DEMOLITION-BY-NEGLECT

Demolition-by-neglect refers to the neglect in the maintenance of any building or structure that allows a hazardous or unsafe condition to occur, including where:

- All or part of the building may fall and injure people or property
- Structural elements are deteriorated such that they can no longer safely carry imposed loads
- A defect or condition makes the building susceptible to water damage, including unmaintained paint on exterior wood surfaces and openings in roofs or walls

The HDC strongly discourages demolition-by-neglect, which may require the replacement of deteriorated building elements in-kind.



The shingles at this roof surface have exceeded their useful life. Replacement is encouraged to minimize potential water infiltration into the building.

## ROOFING & RELATED ELEMENTS CHECKLIST

As a general rule, roofing and its associated components should be reviewed every fall and spring, accompanied by the regular cleaning of leaves and debris from gutters and downspouts. Attention should also be given prior to periods when storms producing severe conditions are more common, such as times of prime winter snow. In addition, it is best to review the gutters, downspouts and attic areas during a rainstorm to determine whether they are functioning properly. Flat roofs or low-sloped roofs are best reviewed immediately following a rainfall to determine whether standing water or pooling is present. Care should be taken when reviewing or maintaining roofs since they are potentially dangerous, particularly when wet.

If there are questions regarding whether the severity of deterioration warrants replacement of an element, consultation with a professional is recommended. It is usually less costly to fix a small problem than to delay action, resulting in more extensive deterioration and repair needs in the future. Refer to the *Guidelines for Roofing* or further information.

MATERIAL / LIFE SPAN	CONDITION OBSERVED	RECOMMENDED ACTION
<b>Roofing – General</b>	<ul style="list-style-type: none"> <li>• Sagging or bowing of roof ridge, surface or rafters</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> May indicate significant structural problems – Consultation with an architect or structural engineer is recommended, particularly if condition worsens</li> </ul>
<b>Wood Shingles or Shakes</b> 30+ years	<ul style="list-style-type: none"> <li>• Shingles or shakes are not laid on open sheathing or batten strips - verify from attic</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Provide proper ventilation in attic</li> </ul>
	<ul style="list-style-type: none"> <li>• Moss, mold or algae is present on roof surface</li> <li>• Wood is cupped or warped</li> <li>• Individual shingles or shakes are split</li> <li>• Individual shingles or shakes are uniformly thin from erosion</li> <li>• Shingles or shakes are missing</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Clean and treat surface to inhibit future growth</li> <li><input type="checkbox"/> Trim back overhanging tree limbs to allow direct sunlight onto roof surface</li> <li><input type="checkbox"/> Replace deteriorated shingles or shakes in-kind</li> <li><input type="checkbox"/> Consider roof replacement if deterioration is substantial or prevalent</li> </ul>
<b>Slate</b> 50+ years	<ul style="list-style-type: none"> <li>• Shingles are not laid on spaced wood boards or batten strips – verify from attic</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Provide proper ventilation in attic</li> </ul>
	<ul style="list-style-type: none"> <li>• Slates are broken or missing</li> <li>• Units are delaminating or flaking apart</li> <li>• Slate or tile particles are present in valleys, gutters and downspouts</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Re-attach, re-secure or replace loose or missing slates or tiles in kind</li> <li><input type="checkbox"/> Replace deteriorated individual slates or tiles in-kind</li> <li><input type="checkbox"/> Consider roof replacement when over 20% of slates or tiles are split, cracked, missing or deteriorated</li> </ul>
<b>Faux Slate – Rubber or Plastic/Polymer Shingles</b> Varies based on manufacturer	<ul style="list-style-type: none"> <li>• Individual shingles are cracked</li> <li>• Individual shingles are curled, warped or bent</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Replace deteriorated shingles with visually similar shingles</li> <li><input type="checkbox"/> Consider roof replacement if deterioration is substantial</li> </ul>
	<ul style="list-style-type: none"> <li>• Shingles are faded or discolored</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Consider roof replacement if deterioration is substantial</li> </ul>

MATERIAL / LIFE SPAN	CONDITION OBSERVED	RECOMMENDED ACTION
<b>Asphalt Shingles</b> 20+ years	<ul style="list-style-type: none"> <li>• Mineral granules are present in gutters and at the base of downspouts</li> <li>• Mineral granules are almost totally worn off shingle surface</li> <li>• Edges of shingles look worn</li> <li>• Shingles are missing</li> <li>• Shingles have lifting or curling edges</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Replace deteriorated or missing individual shingles in-kind</li> <li><input type="checkbox"/> Consider roof replacement when over 20% of units are split, cracked, missing or deteriorated</li> </ul>
	<ul style="list-style-type: none"> <li>• Nails popping up</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Re-fasten or replace affected nails</li> </ul>
	<ul style="list-style-type: none"> <li>• Moss, mold or algae has formed on roof surface</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Clean and treat surface to inhibit future growth</li> <li><input type="checkbox"/> Trim back overhanging tree limbs to allow sunlight to strike roof surface</li> </ul>
<b>Flat Roofs</b> Varies based on product	<ul style="list-style-type: none"> <li>• Asphalt of roofing felt has bubbled, separated or cracked</li> <li>• Roof feels loose or spongy underfoot</li> <li>• Water is pooling on roof</li> <li>• Mineral granules or gravel have worn away</li> <li>• Roofing felt looks dry or cracked</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Consider patching seams with compatible materials if area is isolated</li> <li><input type="checkbox"/> Consider roof replacement if deterioration is substantial or leaking is observed – Verify condition of roof substrate including rafters and plywood sheathing</li> </ul>
<b>Metal Roofs</b> 60+ years	<ul style="list-style-type: none"> <li>• Surface has a substantial number of rust or corrosion spots</li> <li>• Surface has signs of previous tar patch jobs</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Tin, terne-coated steel and terne-coated stainless all need repainting every 5-10 years and regular repair, but can last for decades if properly maintained</li> <li><input type="checkbox"/> Consider patching with compatible materials if area of deterioration is isolated</li> <li><input type="checkbox"/> Consider roof replacement if deterioration is substantial or prevalent</li> </ul>
	<ul style="list-style-type: none"> <li>• Metal is punctured</li> <li>• Joints or seams are broken</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Consider patching or re-soldering with compatible materials if area is isolated</li> <li><input type="checkbox"/> Consider roof replacement if deterioration is substantial or prevalent – Verify condition of roof substrate</li> </ul>
	<ul style="list-style-type: none"> <li>• Surface of flat metal roof bulges</li> <li>• Water pools or stands on surface</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Consider roof replacement if deterioration is substantial or prevalent – Verify condition of roof substrate</li> </ul>
<b>Flashing</b> (Formed sheet metal at joint intersections to prevent moisture penetration)	<ul style="list-style-type: none"> <li>• Flashing is loose, corroded, broken or missing</li> <li>• Flashing has roofing cement or tar</li> <li>• Flashing has openings or gaps</li> <li>• Vertical joints do not have both base and counter flashing</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Consider patching or replacement with compatible materials if area of deterioration is isolated, such as around a chimney</li> <li><input type="checkbox"/> Consider roof replacement if deterioration is substantial</li> </ul>
<b>Roof Projections</b> (Dormer, TV dish, antenna, vent, pipe, skylight, mechanical equipment, lightning rod, cupola, etc.)	<ul style="list-style-type: none"> <li>• Connections around roof projections are not properly flashed and watertight</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Consider patching with compatible materials if area of deterioration is isolated</li> <li><input type="checkbox"/> Removed abandoned rooftop projections that are not historic features to reduce number of roof penetration and attachment locations</li> <li><input type="checkbox"/> Consider flashing replacement if deterioration is substantial</li> </ul>

MATERIAL / LIFE SPAN	CONDITION OBSERVED	RECOMMENDED ACTION
Chimneys	<ul style="list-style-type: none"> <li>Flashing around chimney is not watertight</li> <li>Mortar joints in chimney are open or badly weathered</li> <li>Masonry or stucco coating is cracked or crumbling</li> <li>Chimney is leaning</li> </ul>	<ul style="list-style-type: none"> <li>Consider patching with compatible materials if area of deterioration is isolated</li> <li>Re-point deteriorated or open mortar joints</li> <li>Consider replacement if deterioration is substantial or prevalent – Replacement may necessitate chimney rebuilding from the roof surface up – Replicate all chimney detailing in reconstruction</li> </ul>
	<ul style="list-style-type: none"> <li>Chimney is not properly capped</li> <li>Chimney is not properly lined</li> </ul>	<ul style="list-style-type: none"> <li>Install an appropriate chimney cap for the building style and use dark colors vs. silver</li> <li>Install a chimney liner if wood-burning fireplace is used or if masonry or stucco inside flue is crumbling</li> </ul>
Gutters & Downspouts	<ul style="list-style-type: none"> <li>Gutters or downspouts are clogged</li> </ul>	<ul style="list-style-type: none"> <li>Review roof drainage during a rainstorm – Water should collect in gutters and flow through downspouts without spilling over roof edge</li> <li>Clean out debris at least twice each year, in the spring and fall, or more frequently based on tree proximity and debris accumulation</li> <li>Install screens over length of gutters and/or strainers over downspout locations</li> </ul>
	<ul style="list-style-type: none"> <li>Gutters or downspouts are rusty, loose, askew or tilting</li> <li>Hanging gutter have open or missing seams</li> <li>Sections are missing</li> </ul>	<ul style="list-style-type: none"> <li>Consider repairing or patching with compatible materials if area of deterioration is isolated</li> <li>Consider gutter or downspout replacement if deterioration is substantial or sections are missing</li> </ul>
	<ul style="list-style-type: none"> <li>Metal lining of built-in box gutter has broken seams</li> </ul>	<ul style="list-style-type: none"> <li>Re-solder open joints</li> <li>Consider replacement if deterioration is substantial or prevalent</li> </ul>
	<ul style="list-style-type: none"> <li>Cast iron downspout boots are rusted</li> </ul>	<ul style="list-style-type: none"> <li>Remove rust to bare metal – Apply rust-inhibitive primer and paint</li> </ul>
	<ul style="list-style-type: none"> <li>Water is pooling adjacent to foundation</li> </ul>	<ul style="list-style-type: none"> <li>Re-grade area at foundation to direct water away from building</li> <li>Verify water exiting from downspout is directed away from building foundation - Install splash block or downspout extension at base of downspout to direct water to drain</li> </ul>



*Because of their level of exposure to the elements and temperature changes, chimneys require regular maintenance such as repointing to minimize moisture infiltration into the joints and maintain structural stability.*



*The wood shingles on this roof are covered with lichen, a slow-growing plant that typically forms a crust-like surface that traps moisture in the wood, accelerating deterioration. Also note the missing shingles near the eave.*

## EXTERIOR WOODWORK CHECKLIST

Many of Portsmouth’s most historic residential buildings are wood framed. Generally, exterior woodwork should be reviewed every fall and spring. The fall review allows a property to be prepared for winter and allows the owner to plan for spring repair and painting. The spring review will alert a property owner to damage that occurred over the winter months and allow for repair during fair weather.

If there are questions regarding whether the severity of deterioration warrants replacement, consultation with a professional is recommended. If problems with the paint surface, wood siding or shingles is a reoccurring issue, it could be related to the extreme difference in temperature and relative humidity between the inside and outside from air conditioning and or the type and installation method of insulation in older buildings. Painting of exterior wood elements should be completed when the temperature and relative humidity are within the paint manufacturer’s recommended ranges. (Refer to *Building Insulation*, page 03-12; *Exterior Paint*, page 03- 14, *Guidelines for Exterior Woodwork* and *Guidelines for Windows & Doors*.)



An unsuccessful repair has been applied to the top of this wood pier that does not address the open joint at the cap moulding.

MATERIAL	CONDITION OBSERVED	RECOMMENDED ACTION
Exterior Walls – General	<ul style="list-style-type: none"> <li>Exterior walls not plumb or vertically straight</li> <li>Bulges visible at exterior walls</li> <li>Door and window frames out-of-square</li> <li>Siding surface is wavy</li> </ul>	<ul style="list-style-type: none"> <li>May indicate differential or uneven foundation settlement or significant structural problems – Consultation with an architect or structural engineer is recommended, particularly if condition worsens</li> </ul>
Wood Siding, Shingles & Decorative Woodwork  (Refer to <i>Guidelines for Exterior Woodwork</i> for more information)	<ul style="list-style-type: none"> <li>Loose, cracked, missing or open joints at wood siding, shingles or decorative woodwork</li> </ul>	<ul style="list-style-type: none"> <li>Could lead to water infiltration and rot – Repair or replace in-kind as appropriate</li> <li>Apply caulk to open joints – Verify compatibility with adjacent materials</li> </ul>
	<ul style="list-style-type: none"> <li>Thin or worn shingles</li> </ul>	<ul style="list-style-type: none"> <li>Attempt patching with compatible materials if area of deterioration is isolated</li> <li>Consider replacement in-kind if deterioration is substantial or prevalent</li> </ul>
	<ul style="list-style-type: none"> <li>Open joints around window and door frames</li> <li>Open joints between dissimilar materials (such as wood siding and porch roof)</li> </ul>	<ul style="list-style-type: none"> <li>Re-caulk, apply sealant, repair or replace deteriorated flashing as appropriate – Verify compatibility of caulk or sealant with adjacent materials – Select paintable caulk or sealant if possible</li> </ul>
	<ul style="list-style-type: none"> <li>Mold, algae or mildew on siding or trim, especially on north side or shady areas</li> <li>Vines growing on walls</li> </ul>	<ul style="list-style-type: none"> <li>May indicate moisture problem – Verify if a vapor barrier is present in wall and remove if possible</li> <li>Clean and treat surface to inhibit future growth – Do not use high pressure water since this could result in more significant problems</li> <li>Remove vines and scrub surface with a stiff brush to remove roots on wall surface after they have dried</li> <li>Trim back shrubs and overhanging tree limbs to allow air circulation and sunlight to reach surface</li> </ul>
	<ul style="list-style-type: none"> <li>Original siding or trim covered with vinyl or aluminum siding</li> </ul>	<ul style="list-style-type: none"> <li>Vinyl or aluminum siding and capping can trap moisture and hide rot and damage – Vinyl or aluminum siding and capping should be removed and woodwork inspected for damage and repaired or replaced if necessary</li> </ul>

MATERIAL	CONDITION OBSERVED	RECOMMENDED ACTION
<p><b>Water &amp; Termite Damage</b></p> <p>(Refer to <i>Guidelines for Exterior Woodwork</i> for more information)</p>	<ul style="list-style-type: none"> <li>• Dirt veins on exterior walls, particularly near foundation, steps, under galleries, porches, etc.</li> <li>• Wood is soft when stuck with a small blade or ice pick, particularly window sills, galleries, porches, steps, sills and siding (Refer to <i>Detecting Wood Rot, Guidelines for Exterior Woodwork</i>, page 05-5)</li> <li>• Wood is located on masonry foundation or pier or within 6-inches of ground (Refer to <i>Wood Rot, Guidelines for Exterior Woodwork</i>, page 05-4)</li> <li>• Vegetation, such as shrubs, are located immediately adjacent to foundation</li> <li>• Vines are climbing on building</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Possible indication of termite damage – Contact extermination company to determine if there is active infestation and extent of damage</li> <li><input type="checkbox"/> Possible indication of wood rot or insect infestation – Eliminate source of moisture to control rot and replace defective elements in-kind; contact an extermination company to address possible infestation</li> <li><input type="checkbox"/> Wood on masonry foundations or piers or close to the ground can be vulnerable to rot and termite infestation – Review appropriate alternatives and conduct regular inspections</li> <li><input type="checkbox"/> Retain a pest management company for regular inspections</li> <li><input type="checkbox"/> Vegetation can trap moisture in woodwork by blocking sunlight and air circulation – Remove or thin vegetation close to a building or conduct regular inspections for rot behind vegetation</li> <li><input type="checkbox"/> Climbing vines can trap moisture and grow behind siding – Remove vines to allow air and light at surface</li> </ul>
<p><b>Windows &amp; Doors</b></p> <p>(Refer to <i>Guidelines for Windows &amp; Doors</i> for more information)</p>	<ul style="list-style-type: none"> <li>• Windows and doors do not fit or operate properly</li> <li>• Wood rot, particularly at sills and lower rails</li> <li>• Window is not operational</li> <li>• Glass is cracked</li> <li>• Glazing putty is missing, cracked or deteriorated</li> <li>• Storm/screen windows or doors are missing, deteriorated or non-operational</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Verify whether frame is wracked or out-of-square – Possible indication of differential or uneven foundation settlement or deteriorated wall framing</li> <li><input type="checkbox"/> Verify whether windows are painted shut and hardware (including sash cord or chains) is operational</li> <li><input type="checkbox"/> Repair or selectively replace deteriorated components in-kind</li> <li><input type="checkbox"/> Following repairs, verify deteriorated areas are well painted and joints caulked</li> <li><input type="checkbox"/> Verify whether window has been painted shut</li> <li><input type="checkbox"/> Verify whether sash cords are attached to sash weights</li> <li><input type="checkbox"/> Replace glazing to match existing</li> <li><input type="checkbox"/> Replace glazing putty – Verify compatibility with adjacent materials</li> <li><input type="checkbox"/> Repair or replace deteriorated units as appropriate</li> <li><input type="checkbox"/> Consider installing interior storm windows and doors</li> </ul>
<p><b>Painting</b></p> <p>(Refer to <i>Exterior Paint</i> page 03-14; and <i>Weather Stripping &amp; Caulk, Guidelines for Windows &amp; Doors</i>, page 08-10, for more information)</p>	<ul style="list-style-type: none"> <li>• Chalky or dull finish</li> <li>• Paint surface worn</li> <li>• Peeling, curling, crazing and blistering</li> <li>• Caulk or sealant not adhering</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Surface cleaning might be all that is needed</li> <li><input type="checkbox"/> If repainting, additional preparation might be required</li> <li><input type="checkbox"/> Wood generally needs repainting every 5 to 8 years</li> <li><input type="checkbox"/> Possible indication of non-compatible paint for surface – Review type of finish on existing material and confirm type of preparation required for new paint; may include surface scraping and sanding and/or application of primer</li> <li><input type="checkbox"/> Possible indication of a moisture problem – Review drainage, potential leaks and whether there is a vapor barrier within the wall – Remove vapor barrier if possible</li> <li><input type="checkbox"/> Check for drainage problems if area of failure is near gutter, downspout or intersecting roof, such as a porch</li> <li><input type="checkbox"/> Verify compatibility with caulk or sealant and surface material – Select paintable caulk or sealant if possible</li> </ul>

## EXTERIOR MASONRY & STUCCO CHECKLIST

Masonry is present in almost all buildings, frequently as a foundation, pier, or chimney, and sometimes as the wall material. Since masonry is often part of the structural system of older buildings, it is critical that it be maintained to prevent serious problems. Masonry and stucco repair and cleaning should be conducted when the temperature is consistently between 40 and 90 degrees Fahrenheit to minimize potential spalling, problems associated with colder temperatures, and shrinkage with warmer temperatures. Painting or coating of masonry and stucco, where appropriate, should be completed when the temperature and relative humidity are within the paint or coating manufacturer’s recommended ranges. For further information, refer to the *Guidelines for Masonry & Stucco*.



*This garden wall, constructed of stone and brick, has deteriorated bricks, mortar loss, and significant cracking at the upper right corner.*

MATERIAL	CONDITION OBSERVED	RECOMMENDED ACTION
<b>Exterior Walls &amp; Piers – General</b>	<ul style="list-style-type: none"> <li>• Cracks in masonry wall</li> </ul>	<ul style="list-style-type: none"> <li>□ May indicate differential or uneven foundation settlement or significant structural problems – Consultation with an architect or structural engineer is recommended, particularly if condition worsens</li> <li>□ Vertical and/or diagonal cracks or cracks that split individual bricks or stones indicate a potentially more significant problem, such as uneven settlement while Horizontal cracks or hairline cracks limited to mortar joints or individual stones or bricks tend to be less serious</li> <li>□ Monitor and photograph condition biannually after repair to see if cracks return</li> </ul>
	<ul style="list-style-type: none"> <li>• Bows or bulges in wall plane</li> <li>• Leaning walls</li> </ul>	<ul style="list-style-type: none"> <li>□ May indicate differential or uneven foundation settlement or significant structural problems – Consultation with an architect or structural engineer is recommended, particularly if condition worsens</li> </ul>
	<ul style="list-style-type: none"> <li>• Water ponding adjacent to foundation</li> <li>• Vegetation, such as shrubs, located immediately adjacent to foundation</li> <li>• Vines growing on walls</li> <li>• Damp walls</li> <li>• Moss or algae on masonry surface</li> </ul>	<ul style="list-style-type: none"> <li>□ Verify water exiting downspout is directed away from building foundation – Install splash blocks or downspout extensions to direct water away from wall</li> <li>□ Vegetation can trap moisture in masonry by blocking sunlight and air circulation – Remove or thin vegetation close to a building or conduct regular inspections for algae and mold behind vegetation – Remove vines</li> <li>□ Re-grade area adjacent to foundation to direct ground water away from building</li> <li>□ Remove vines and scrub surface with a stiff brush to remove roots on wall surface after they have dried</li> <li>□ Clean moss or algae from wall surface with low pressure water, with the possible use of gentle detergent and brushing</li> </ul>
	<ul style="list-style-type: none"> <li>• Efflorescence, usually a white, powdery surface due to water-soluble salts, leaching out of masonry and depositing on a surface by evaporation</li> </ul>	<ul style="list-style-type: none"> <li>□ Clean efflorescence from wall surface with low pressure water, with the possible use of gentle detergent and a natural bristle brush</li> <li>□ Review area for possible sources of moisture</li> </ul>



MATERIAL	CONDITION OBSERVED	RECOMMENDED ACTION
Mortar	<ul style="list-style-type: none"> <li>• Soft and crumbling</li> <li>• Open joints or broken joint bonds</li> </ul>	<ul style="list-style-type: none"> <li>□ Consider patching with compatible mortar if area of deterioration is isolated – It is critical that mortar match original in appearance, profile, hardness and composition to minimize potential reoccurrence</li> <li>□ Consider replacement if deterioration is substantial</li> </ul>
	<ul style="list-style-type: none"> <li>• Spalling, chipping, flaking, cracking or crumbling of surface</li> <li>• Loose or missing stones or bricks</li> </ul>	<ul style="list-style-type: none"> <li>□ Replace incompatible mortar and match original</li> <li>□ Consider patching with compatible materials if area of deterioration is isolated</li> <li>□ Consider replacement if deterioration is substantial</li> </ul>
Stones & Bricks	<ul style="list-style-type: none"> <li>• Pitted surface from sandblasting or pressure wash</li> <li>• Pitted surface from stucco removal</li> </ul>	<ul style="list-style-type: none"> <li>□ Masonry with a damaged surface is more likely to absorb moisture, leading to accelerated deterioration – Consult a professional</li> <li>□ Photograph condition and monitor biannually to see if surface continues to deteriorate</li> <li>□ Review adjacent materials and interior finishes for signs of moisture infiltration and rot</li> </ul>
	<ul style="list-style-type: none"> <li>• Cracks in surface</li> </ul>	<ul style="list-style-type: none"> <li>□ Consider patching with compatible stucco if area of deterioration is isolated</li> <li>□ Consider replacement if deterioration is substantial</li> <li>□ Substantial cracks might indicate differential or uneven foundation settlement or severe structural problems – Consultation with an architect or structural engineer is recommended, particularly if condition worsens</li> </ul>
Stucco	<ul style="list-style-type: none"> <li>• Bulges in wall</li> </ul>	<ul style="list-style-type: none"> <li>□ Verify keying of stucco to lath or underlying substrate – If wall area moves when pushed, stucco is not bonded and should be replaced with compatible material to avoid potential surface collapse</li> <li>□ Check for moisture trapped behind stucco surface</li> </ul>
	<ul style="list-style-type: none"> <li>• Chalky or dull finish</li> </ul>	<ul style="list-style-type: none"> <li>□ Additional preparation might be required prior to repainting – Preparation dependant on surface</li> </ul>
Painted Masonry & Stucco	<ul style="list-style-type: none"> <li>• Peeling, flaking, curling and blistering</li> </ul>	<ul style="list-style-type: none"> <li>□ Possible indication of a moisture problem – Review drainage, potential leaks and for presence of a vapor barrier in the wall – Remove vapor barrier if possible</li> <li>□ Check for drainage problem if paint failure near a roof edge, downspout, porch ceiling or foundations are often the result of drainage problems</li> </ul>
	<ul style="list-style-type: none"> <li>• Paint surface worn</li> </ul>	<ul style="list-style-type: none"> <li>□ Similar to woodwork, painted masonry tends to need repainting every 5 to 8 years with compatible paint</li> </ul>



*The irregularity of the brick and worn surface suggests that it was produced by hand and is relatively soft. Most of the mortar at the joints has worn away. The white repointing mortar applied over the window likely includes a high proportion of Portland cement and is too hard for the softness of the brick. The crack adjacent to the top corner of the window is a possible indication of a structural problem that should be reviewed by a professional.*

## PROPERTY CHECKLIST

Exterior maintenance extends beyond a building’s perimeter to include the surrounding property. Seasonal property maintenance includes cutting grass, raking leaves and snow removal. Larger maintenance issues include: water management on the site, trimming trees, and regular repairs to fences, walls, walkways and paved surfaces. Specific maintenance might be required for specialized site elements such as water features. Prior to anticipated storms, secure furnishings and features that could become airborne in high winds.

MATERIAL	CONDITION OBSERVED	RECOMMENDED ACTION
<b>Water Management</b>	<ul style="list-style-type: none"> <li>• Rain water or snow melt flows toward building foundation</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Re-grade around foundation to direct water away from building</li> </ul>
	<ul style="list-style-type: none"> <li>• Water ponding adjacent to foundation</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Verify water exiting downspouts is directed away from building foundation – Install splash blocks or downspout extensions to direct water away from wall</li> </ul>
	<ul style="list-style-type: none"> <li>• Vegetation, such as shrubs, located immediately adjacent to foundation or vines are climbing on buildings</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Vegetation can trap moisture in wall surfaces by blocking sunlight and reducing air circulation – Remove or thin vegetation close to building or conduct regular inspections for rot, algae, fungus and mold behind vegetation – Remove climbing vines</li> </ul>
	<ul style="list-style-type: none"> <li>• Tree limbs extend over roof</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Shade from the sun can lead to the formation of moss, fungus, mold or algae – Leaves and debris collect in and clog gutters and downspouts and tree limbs can cause severe damage if they fall during a storm – Trim limbs 5-feet away from building – Maintain gutters and downspouts</li> </ul>
<b>Metal &amp; Wood Fences</b>	<ul style="list-style-type: none"> <li>• Metal fences</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Check for rust spots or bare metal – Remove rust, prime and repaint every 5 to 8 years</li> </ul>
	<ul style="list-style-type: none"> <li>• Wood fences</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Check for deterioration, follow recommendations in the <i>Exterior Woodwork Checklist</i>, page 03-6</li> <li><input type="checkbox"/> Anticipate repainting or staining every 5 to 8 years</li> </ul>
<b>Sidewalk, Walkway &amp; Patio Pavers</b>	<ul style="list-style-type: none"> <li>• Brick, flagstone or concrete pavers cracked or missing</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Verify the condition of the sub-base and replace deteriorated or missing units in-kind</li> </ul>
	<ul style="list-style-type: none"> <li>• Water ponding on paved surface</li> <li>• Subsidence of paved surface</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Verify the condition of the sub-base and reset individual units to allow appropriate drainage</li> </ul>
	<ul style="list-style-type: none"> <li>• Vegetation growing between individual units</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Some vegetation has a substantial root structure that can dislodge individual paving units – Remove vegetation if appropriate</li> </ul>
<b>Asphalt &amp; Concrete Paving &amp; Driveways</b>	<ul style="list-style-type: none"> <li>• Cracked surface</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Seal cracks to minimize potential water infiltration</li> <li><input type="checkbox"/> Consider sealing or repaving entire surface if cracks are substantial or prevalent</li> </ul>
	<ul style="list-style-type: none"> <li>• Water ponding on paved surface</li> <li>• Subsidence of paved surface</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Verify the condition of the sub-base and patch to allow appropriate drainage</li> </ul>
	<ul style="list-style-type: none"> <li>• Rodent droppings</li> <li>• Holes from burrowing animals</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Possible indication of pest infestation – Contact pest management company to determine if there is active infestation or nesting birds – Review appropriate alternatives and conduct regular inspections</li> </ul>
<b>Snow &amp; Ice</b>	<ul style="list-style-type: none"> <li>• Accumulation on surfaces</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Remove snow and ice from paved surfaces, minimizing use of salt or chemicals adjacent to building foundations</li> <li><input type="checkbox"/> Remove snow piled against wood surfaces including siding, steps and doors</li> <li><input type="checkbox"/> Remove excess snow from roof surfaces to minimize overburdening of structure</li> </ul>

## INTERIOR CHECKLIST

Exterior maintenance problems can be most evident at the interior of a building. The areas most likely to demonstrate exterior problems tend to be the least-visited parts of a house, such as the attic, basement or crawlspace. It is important to remember that attics, basements and crawlspaces are spaces with distinct conditions. Attics sit directly under roofs and thus can be highly susceptible to moisture infiltration. Similarly, a basement or a crawlspace is vulnerable to moisture and pest infestation and damage. Because these spaces typically do not have heat, air conditioning, or moisture control at the same levels as the rest of the building, problems can fester and become severe before being noticed. It is important that these areas, though often awkward to access, receive regular attention.



The dark areas at the top of the truss and the white surface residue are both signs of moisture infiltration that should be addressed.

MATERIAL	CONDITION OBSERVED	RECOMMENDED ACTION
<b>Attic Space</b>	<ul style="list-style-type: none"> <li>• Water stains on rafters or roof boards – Probably indicated by either a dark patch on the wood or plaster or a white bloom indicating salt crystallization</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Review during or immediately following a rainstorm to understand whether staining is an active or past problem – Pay particular attention to flashing locations around roof penetrations such as vent pipes, chimneys and dormer windows, as well as at valleys and eaves, especially prior to storm seasons</li> </ul>
	<ul style="list-style-type: none"> <li>• Mildew on underside of roof structure</li> <li>• Dampness in attic space</li> <li>• Overheated attic</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Verify whether the attic is sufficiently ventilated</li> </ul>
	<ul style="list-style-type: none"> <li>• Broken or missing collar beams</li> <li>• Cracked or sagging rafter</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Potential structural problem – Consultation with an architect or structural engineer is recommended, particularly if condition worsens</li> </ul>
	<ul style="list-style-type: none"> <li>• Inadequate insulation at attic floor or between rafters</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Install appropriate insulation without a vapor barrier – Select insulation that is reversible and will not cause damage if wet</li> </ul>
<b>Basement &amp; Crawlspace</b>	<ul style="list-style-type: none"> <li>• Mortar of walls or piers is soft and crumbling</li> <li>• Damp or moldy smell</li> <li>• Evidence of dampness under first floor framing or around pipes</li> <li>• Evidence of wood rot or insect infestation at wood sills on top of foundation walls or first floor joists</li> <li>• Periodic flooding</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Review for potential moisture infiltration</li> <li><input type="checkbox"/> Verify water exiting from downspouts is directed away from building foundation – Install splash blocks or downspout extensions at base of downspouts</li> <li><input type="checkbox"/> Re-grade area at foundation to direct rain water or snow melt away from building</li> <li><input type="checkbox"/> Verify that foundation vents are clear of debris</li> <li><input type="checkbox"/> Check underground water supply and drainage systems for cracked or clogged pipes</li> <li><input type="checkbox"/> Re-point areas of deteriorated mortar</li> <li><input type="checkbox"/> Apply stucco to brick piers if appropriate</li> <li><input type="checkbox"/> Retain a pest management company to provide regular inspections and contact immediately for potential infestation</li> </ul>
	<ul style="list-style-type: none"> <li>• Inadequate insulation (Refer to <i>Building Insulation</i>, page 03-12)</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Install insulation under first floor framing</li> <li><input type="checkbox"/> Install appropriate insulation around pipes, heating and air conditioning ducts – Condensation can form on uninsulated equipment and pipes</li> </ul>

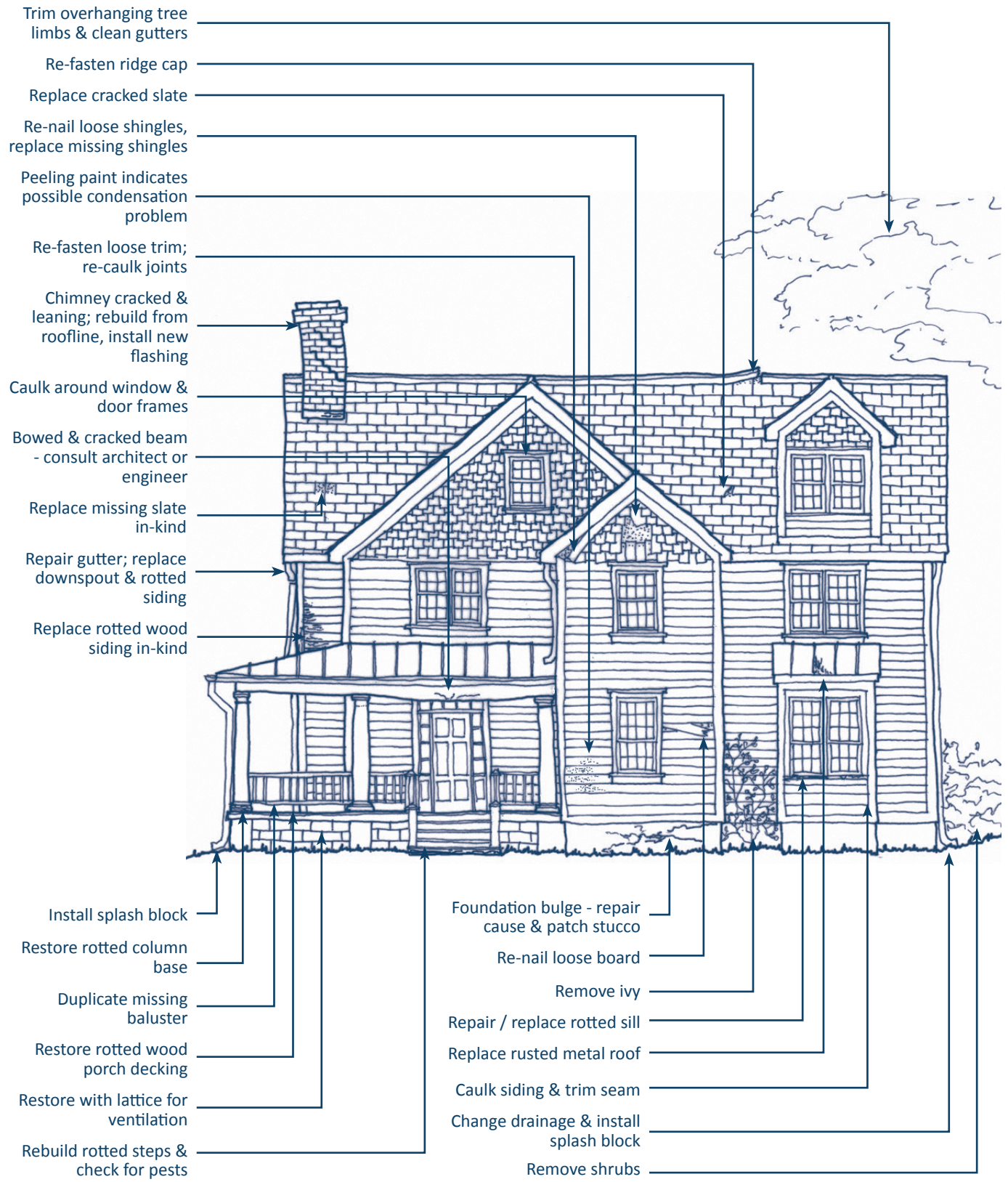
## BUILDING INSULATION

Insulation can be an efficient and cost-effective means of reducing heat transfer through building walls and associated heating and cooling bills. Before installing insulation, ensure all cracks and openings are sealed (caulked) including around pipe penetrations, chimneys, electrical outlets and lights. (Refer to Weather Stripping & Caulk, *Guidelines for Windows & Doors*, page 08-10.) Some of the most common types of insulation can be found in the table below. It is highly recommended that all of the insulation manufacturer’s safety and installation recommendations be followed. Property owners should consult [www.energystar.gov](http://www.energystar.gov) for insulation types and levels, as well as recommendations applicable to specific locations and construction conditions.

TYPE /MATERIAL	BENEFITS	DISADVANTAGES
<b>Blanket – Batts &amp; Rolls</b> <ul style="list-style-type: none"> <li>Fiberglass</li> <li>Mineral Wool</li> <li>Plastic Fiber</li> <li>Natural Fiber</li> </ul>	<ul style="list-style-type: none"> <li>Sized to fit between standard spaced studs, joists, and beams that are relatively free of obstructions such as pipes, conduits, and braces</li> <li>Relatively inexpensive</li> <li>Can be do-it-yourself project – <i>Wear protective eye wear and clothing</i></li> </ul>	<ul style="list-style-type: none"> <li>Can become matted-down if wet</li> <li>Vapor barriers found on most blanket insulation can cause condensation problems and rot wood framing – <i>Install without backing or with air barrier only</i> – If installing with vapor barrier, install barrier facing interior</li> <li>Should not be “stuffed” around obstructions – Can be a fire hazard around damaged electrical wiring</li> </ul>
<b>Loose-Fill &amp; Blown-In Insulation</b> <ul style="list-style-type: none"> <li>Cellulose</li> <li>Fiberglass</li> <li>Mineral Wool</li> </ul>	<ul style="list-style-type: none"> <li>Good for irregularly spaced areas and around obstructions</li> <li>Only minor disturbance of finishes required for installation</li> <li>Some materials can be poured rather than blown-in</li> </ul>	<ul style="list-style-type: none"> <li>Generally must be blown-in using special equipment</li> <li>Settles over time, requiring additional application, particularly in walls</li> <li>Cellulose, the most common, is essentially newspaper – When wet, it retains water and can rot wood framing</li> <li>Cellulose can become home for nesting pests or insects such as termites and carpenter ants – Borate treatment can corrode metal pipes, conduit, and electrical wiring</li> </ul>
<b>Radiant Barriers &amp; Reflective Insulation</b> <ul style="list-style-type: none"> <li>Foil-faced kraft paper</li> <li>Plastic film</li> <li>Polyethylene bubble</li> <li>Cardboard</li> </ul>	<ul style="list-style-type: none"> <li>Reflects radiant heat, such as sunlight, away from living space – Can be highly effective in attics</li> <li>Sized to fit between standard spaced studs, joists, and beams</li> <li>Bubble systems can be effective around obstructions</li> <li>Can be do-it-yourself project</li> </ul>	<ul style="list-style-type: none"> <li>Must face an air space, such as an attic, to be effective</li> <li>If not properly installed, can act as a vapor barrier and cause condensation and rot wood framing members</li> <li>Cardboard can become home for nesting pests or insects such as termites and carpenter ants – Borate treatment can corrode metal pipes, conduit and electrical wiring</li> </ul>
<b>Sprayed Foam &amp; Foamed-in-Place</b> <ul style="list-style-type: none"> <li>Cementitious</li> <li>Phenolic</li> <li>Polyisocyanurate</li> <li>Polyurethane</li> </ul>	<ul style="list-style-type: none"> <li>Good for irregularly spaced areas and around obstructions</li> <li>Typically no disturbance of finishes required for installation</li> </ul>	<ul style="list-style-type: none"> <li>Made from fossil fuels, can have toxic fumes and be highly flammable</li> <li>Requires professional installation – Adheres to all surfaces; can have voids if not properly installed – Relatively expensive installation</li> <li>Termites and carpenter ants can tunnel through, increasing infestation risk</li> <li>Open-cell softer, often not a vapor barrier</li> <li>Closed-cell is a vapor barrier and can cause condensation problems and rot at wood framing – Removal generally requires “chiselling out” between all framing members</li> </ul>
<b>Foam Board</b> <ul style="list-style-type: none"> <li>Polystyrene</li> <li>Polyisocyanurate</li> <li>Polyurethane</li> </ul>	<ul style="list-style-type: none"> <li>High insulation value for relatively little thickness</li> </ul>	<ul style="list-style-type: none"> <li>Made from fossil fuels, can have toxic fumes and be highly flammable</li> <li>Must be cut to fit around all obstructions – <i>Requires complete removal of wall finish</i></li> <li>Termites and carpenter ants can tunnel through, increasing infestation risk</li> <li>Can be installed under un-vented, low-sloped roofs</li> </ul>

# TYPICAL BUILDING MAINTENANCE NEEDS

**General:** Scrape all loose paint; sand to smooth surface; prime bare wood and metal; re-paint with historically appropriate colors





*The paint is blistering and peeling exposing the underlying siding to the elements and moisture infiltration. Complete removal of the paint down to bare wood and repair of areas of deterioration is recommended prior to the application of a high-quality wood primer followed by two coats of compatible paint.*

## EXTERIOR PAINT

Paint is one of the most common ways to protect exterior materials from the elements, particularly wood without natural or chemical preservatives, and metals that would otherwise rust. When the painted surface has been compromised, moisture and the elements can infiltrate the underlying material and substrate, accelerating deterioration.

Exterior paint provides a layer of protection to a building by limiting moisture infiltration and damage from the sun, pests and other forms of deterioration. Exterior woodwork without natural or chemical preservatives is susceptible to moisture-related wood deterioration of the exterior envelope and underlying framing. Many metals are susceptible to rust. Although paint is an important protective layer that improves the longevity of a historic building element, it must be viewed as a temporary barrier that is subject to deterioration through cyclical temperature and humidity changes. It requires re-application to maintain its shielding properties.

In addition to providing a protective layer, paint colors can highlight a building's architectural features and style, visually tie parts of a building together, and reflect personal taste. A building's style, period of construction, materials and setting can all help identify appropriate paint colors.

In general, exterior surfaces should be repainted every 5 to 8 years, with intermediate touch-ups of high traffic, worn or deteriorated areas. If a building requires frequent repainting, it might be an indication of another problem including moisture, inadequate surface preparation and non-compatible paint.

Encapsulating paints can be problematic as they can trap moisture in woodwork and promote rot. These are often referred to as "liquid siding," "liquid stucco" or "liquid ceramic coatings." Painting of previously unpainted masonry is strongly discouraged. (Refer to *Removing Paint from Masonry, Guidelines for Masonry & Stucco*, page 07-8.)

## OIL & LATEX PAINTS

Essentially, there are two types of wood paint for buildings, oil and latex. Both types consist of three principal components: a pigment, a binder to adhere the pigment to a surface as the paint dries and a solvent that makes the mixture loose enough to apply with a brush. Even though latex was developed in the mid 1940s, oil was the dominant paint type until about 1970 and is found on many historic homes today.

Oil and latex paints act differently when applied to a surface. Oil paint forms a tough plastic film as the binder reacts with oxygen in the air. The binder can be natural oil, such as linseed, or oil modified with alkyds. Early latex paint used synthetic rubber as the binder, while latex paint today uses acrylic, vinyl-acrylic or vinyl acetate binders. As the water in latex paint evaporates, it forms a flexible film and the binder and pigment move closer together until a protective surface is formed. Critical differences between oil and latex paints are that they do not cure in the same way and they adhere differently to substrates. As oil paint ages it continues to cure and oxidize. It becomes more and more brittle to the point it can no longer expand and contract with the underlying substrate through temperature and humidity cycles. By contrast, latex cures in about two weeks and remains more pliable.

Generally, oil paint adheres better to problem surfaces because the oils are small enough to seep into the wood or microscopic openings in old, even chalky, paint. The resins in latex paint are generally too large to seep into the substrate, allowing water vapor to pass through. This makes latex less likely to peel from a building with excessive interior moisture, although multiple layers of paint can create an impermeable moisture barrier. Another characteristic of latex paint is that its flexibility can impose surface tension to underlying layers of paint, particularly oil, and pull the paint away from the substrate.

In Portsmouth's climate, it is generally recommended to apply an oil or latex bonding primer to provide a smooth finish, followed by two coats of acrylic latex paint. Property owners should consult with a paint professional to obtain the best recommendation for each specific paint project.

## REPAINTING

When considering repainting, the following five steps are recommended:

- 1. Determine whether repainting is necessary:** Prior to beginning a painting project, it is appropriate to determine whether complete repainting is required or if cleaning or spot repainting is more appropriate. By painting more often than is necessary, paint layers can build up, increasing the potential for future paint failure. A dingy finish might only require washing with a mild detergent solution and natural bristle brushes to freshen the appearance.
- 2. Inspect existing paint for causes of failure:** To assure the new paint will last as long as possible, property owners should inspect the existing paint for causes of failure. Some common paint problems are:
  - **Peeling** – Possible causes are painting under adverse conditions, inadequate surface preparation or moisture infiltration
  - **Cracking or crazing** – This is typically the sign of a hard surface that does not expand and contract with underlying material – Sand and repaint if cracking and crazing is limited to the surface; remove paint if it extends down to the wood
  - **Wrinkling** – This is usually the result of the top coat drying before the underlying coat – Sand smooth; repaint
  - **Blistering** – This indicates air bubbles under the paint – Cut into blister; if wood is visible the problem is probably moisture related; if paint is visible, the problem area was probably painted in direct hot sun
  - **Alligatoring** – This is severe cracking and crazing – Remove all paint down to bare wood

## SPECIALTY PAINTS

### Elastomeric or Encapsulating Paint

Encapsulating paints can trap moisture in woodwork, promote rot and/or provide a desirable environment for pests such as termites. These paints are often referred to as “liquid siding,” “liquid stucco” or “liquid ceramic coatings.” **Use of encapsulating paint is strongly discouraged by the HDC.**

### Masonry Paint

Refer to *Removing Paint from Masonry and Masonry & Stucco Painting, Guidelines for Masonry & Stucco*, page 07-8. **Painting previously unpainted brick or stone is strongly discouraged by the HDC.**

### Metal Painting

The paint selected must be compatible with the type of metal and any existing coatings. In the case of iron-based metals, typically found at railings and grates, paint preparation should include the removal of rust to bare metal, cleaning the surface and promptly applying a rust-inhibiting primer to prevent corrosion.

- 3. Repair causes of failure:** Before repainting, the causes of paint failure should be addressed. The most common cause of paint failure is moisture. The most typical causes of moisture problems are ground water; rain or storm water; leaking plumbing; and condensation. (Refer to *Wood Rot*, page 05-4 and the *Guidelines for Exterior Maintenance* for additional information.) Portions of the building that are most susceptible to moisture and its related problems include: areas near rooflines, gutters and downspouts; areas near the ground; horizontal surfaces such as window and door sills, porches and wood steps; and areas or walls adjacent to high humidity including kitchens, bathrooms and laundry rooms.
- 4. Prepare surface:** To ensure a long-lasting painted surface, appropriate preparation should occur before repainting.
  - Begin by washing the painted surfaces with a mild detergent solution and a natural-bristle brush
  - Carefully scrape and sand for a smooth finish, removing any paint that is not tightly bonded to the surface
  - Putty or caulk countersunk nails, window glazing, gaps, joints and openings
  - Allow substrate to dry thoroughly before applying primer or paint
  - Spot prime bare wood, areas of repair and wood replacement
- 5. Repaint:** High-quality paint appropriate for the substrate applied in accordance with manufacturer’s recommendations should improve the longevity of a paint job. In general, it is best to use compatible primer and paint from the same manufacturer, and apply the primer to base wood or metal. Primer and two coats of paint are recommended for previously unpainted surfaces.
  - For best results, apply paint during appropriate weather conditions, generally 50°F to 90°F, less than 60% relative humidity, out of direct sunlight

## COMPLETE PAINT REMOVAL

It is important to remember that any method of paint removal can result in harm to historic building fabric. Therefore, complete paint removal from a surface should only occur under limited circumstances. Complete paint removal might be necessary in circumstances in which the existing paint on a surface has completely failed. Examples where complete paint removal would be appropriate include:

- Wholesale blistering or peeling that reveals the underlying substrate
- Continuous patterns of deep cracks in the surface of painted wood
- Windows, doors or shutters that have been painted shut
- Where necessary to achieve a smooth transition between existing surfaces and a new wood repair element
- At historic building features to prevent deterioration
- Painted masonry at historically unpainted masonry surfaces to prevent deterioration

(Refer to *Exterior Woodwork Checklist*, page 03-6 and *Safety Precautions, Guidelines Introduction*, page 1-16.)

## HDC EXTERIOR MAINTENANCE PRINCIPLES

### When is HDC Review Not Required?

The HDC encourages regular, ordinary maintenance of the exterior of buildings and structures throughout the historic district. Therefore, a Certificate of Approval is not required for the following maintenance tasks:

- Ordinary maintenance and repair of any architectural feature which does not involve a change in design, materials, or exterior appearance
- Painting or repainting of structures
- Maintenance and repair of a fire wall, chimney, entryway or deck in-kind, including design and materials

### Maintenance Principles

#### *The HDC encourages:*

- Providing non-intrusive repairs, focusing on deteriorated areas, to stabilize and protect the building's important materials and features
- When repair is not possible, replacing in-kind to the greatest extent possible, reproducing by new construction the original feature exactly and using similar techniques to match the original material, size, scale, finish, detailing and texture
- When replacement in-kind is not possible, using compatible materials and techniques that convey an appearance similar to the original feature, and using materials similar in design, color, texture, finish, longevity and visual quality to the historic elements
- Utilizing sustainable materials such as wood
- Following all City, State and EPA requirements for safe paint disturbance, preparation and removal
- Preparing exterior woodwork by hand washing with a mild detergent and natural bristle brush, hand scraping and hand sanding or carefully using a mechanical sander on flat wood surfaces without decorative profiles
- Consulting with paint manufacturer to determine the best type of paint for a specific application – Pertinent issues include the material being painted, location, existing paint or coating and existing chemical treatments
- Following all manufacturers' instructions for preparation, cleaning, application and safety – Verify weather conditions are compatible with the paint label guidelines
- Investing in higher quality paint – These generally cost more initially, but can last significantly longer, saving money long-term
- Painting downspouts, security devices, light fixtures, conduit, wiring, etc. to match attachment surface

#### *The HDC discourages:*

- Introducing modern materials that can accelerate and hide deterioration, or encapsulating historic features

- Replacing original materials with modern non-traditional materials
- Applying semitransparent stain or varnish at exterior woodwork or opaque stain at building elements unless historically appropriate
- Applying latex or oil-based paint at masonry or stucco (Refer to *Masonry & Stucco Painting, Guidelines for Masonry & Stucco*, page 07-7)
- Applying elastomeric or encapsulating paint at woodwork
- Painting traditionally unpainted materials, such as slate, terra cotta and previously unpainted brick and stone
- Applying chemical paint remover – Can raise grains of some woods, be expensive and potentially volatile; runoff is potentially hazardous and should be collected to prevent harm to children, pets, vegetation and storm water
- Using a flame tool such as a blowtorch to soften paint – Smoldering sparks can start a potentially devastating fire and lead components in paint can vaporize and create highly toxic fumes
- Sandblasting – It can be abrade a surface and wear away a protective exterior coating
- Using a high pressure water wash – It forces water into open joints wetting interior finishes and structural framing and abrading the exterior surface
- "Dipping" to remove paint on an architectural element such as a shutter, window or door, because of the likelihood of uneven shrinkage of individual parts and disintegration of internal glue at joints

#### *The HDC strongly discourages:*

- Postponing maintenance and repair leading to a condition of demolition-by-neglect

### Paint Removal Safety

Paint removal is potentially hazardous work. Keep children and pets clear of work areas. Property owners should consult a professional for work that is unfamiliar or potentially unsafe.

- Paint removal, particularly lead-based paint removal, must comply with City Health Department and EPA requirements — Owners are strongly encouraged to contact the lead safety organizations found in the *Guidelines Introduction*, page 01-16, for additional information prior to completing any work potentially involving lead paint
- Always wear safety goggles and a respirator
- If using heat tools — Users should always wear appropriate clothing, keep a fire extinguisher nearby and monitor areas of work for at least one hour after stopping work
- Paint dust from older buildings can contain lead — Wear a respirator, avoid open food or beverage containers in area of paint removal, thoroughly clean work area and exposed skin, launder work clothes separately

