GUIDELINES FOR
EXTERIOR MAINTENANCE

Township of Hopewell
Historic Preservation Commission

GUIDELINES FOR EXTERIOR MAINTENANCE

The wood base is in contact with the concrete foundation. Regular wood dampness can eventually lead to rot and deterioration.

PURPOSE

These *Guidelines* were prepared to assist property owners with information regarding exterior building maintenance to encourage the continued preservation of their property. They are not intended to replace consultation with qualified architects, contractors and the Historic Preservation Commission (HPC). The HPC is happy to provide consultation and assistance with materials, free of charge.

These *Guidelines* were developed in conjunction with Hopewell Township's Historic Preservation Commission (HPC). The HPC reviews Certificate of Appropriateness (COA) applications for proposed exterior alterations to properties locally designated as Historic Landmarks or within a local Historic District. The applicant is responsible for complying with the provisions of the Zoning and Building Codes at the time of application. The applicant must obtain a Certificate of Appropriateness (COA) as well as all necessary permits prior to proceeding with any work. For more information, or to obtain permit applications, please call the COA Administrator at (609) 737-0612, ext. 643.

Please review this information during the early stages of planning your project. Familiarity with this material can assist in moving a project quickly through the approval process, saving applicants both time and money. Additional *Guidelines* addressing other historic building topics are available at the Township Administration Building and on its web site at www.hopewelltwp.org.

BUILDING MAINTENANCE

The historic architecture of Hopewell Township features a well-constructed housing stock of mid-eighteenth through mid-twentieth century buildings. Many of these homes continue to serve Township residents because they have been maintained by previous and present owners.

A home is typically a family's largest single investment. One of the best ways to help a property retain its value in the marketplace is to implement a regular and preventive maintenance schedule. 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 until a serious problem develops. When the problem is finally noticed, the associated repairs can be significantly more involved and costly to address.

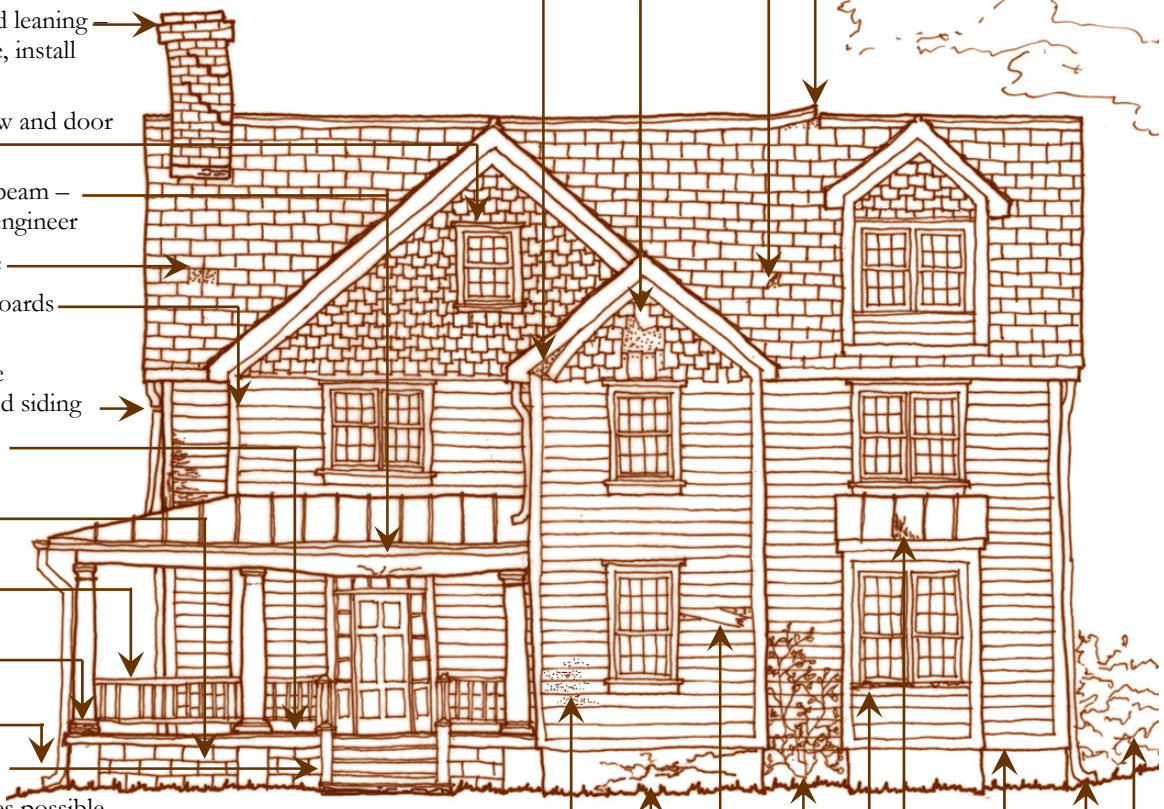
The exterior envelope of a building is made up of the roof, walls, windows and doors. These components act together as a system to protect the interior from exterior environmental extremes. Some of the environmental influences affecting the exterior building envelope include:

- Moisture, rain, snow, ice, humidity, 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 compromise a building's exterior envelope and cause deterioration. The potential reactions are further complicated by the way the materials are installed and joined together. However, by implementing a regular maintenance and repair program, the rate of deterioration can be dramatically slowed, allowing the Township's historic buildings to last for centuries.

TYPICAL BUILDING MAINTENANCE NEEDS

General:
Scrape all loose paint; prime bare wood and metal; re-paint with historically appropriate colors



Trim overhanging tree limbs and clean gutters

Re-fasten ridge cap

Replace cracked slate

Re-nail loose shingles, replace missing shingles

Re-fasten loose trim; re-caulk joints

Chimney cracked and leaning rebuild from roofline, install new flashing

Caulk around window and door frames

Bowed and cracked beam – consult architect or engineer

Replace missing slate

Caulk between clapboards and corner boards

Repair gutter; replace downspout and rotted siding

Replace rotted wood decking

Replace with lattice for ventilation

Replace missing balusters

Replace rotted column base

Install splash block

Rebuild rotted steps

Peeling paint indicates possible condensation problem

Foundation bulge – repair cause and patch damaged stucco

Re-nail loose board

Remove ivy

Repair/replace rotted sill

Replace rusted metal roof

Caulk seams between stucco and wood

Change drainage and install splash block

Remove shrubs

The regular cleaning of gutters and downspouts is one of the most effective preventive maintenance tasks. Clean gutters and downspouts provide a means for moisture that accumulates on the roof to be directed away from the building without causing damage. This gutter is filled with leaves, twigs and debris preventing clear drainage and allowing water to overflow the gutter and damage exterior wall surfaces. Gutters and downspouts should be cleaned at least twice each year to minimize potential problems.

MAINTENANCE IS PRESERVATION

Regular maintenance helps to preserve buildings and property, protect real estate values and investments, and keeps Hopewell Township an attractive place to live, work and visit.

Lack of regular upkeep can result in accelerated deterioration of building elements and features. Small openings or unpainted surfaces can allow moisture penetration and eventually rot. In the case of historic buildings, these features often represent character defining elements that are difficult and costly to replace. Long-term lack of maintenance can impact a building's structure, resulting in expensive repairs.

It is prudent for property owners to inspect their 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 also can prevent or postpone extensive and costly future repairs. Regular maintenance items typically include painting, and cleaning gutters and downspouts. It is also prudent to inspect the roof and any signs of moisture infiltration, open joints, and cracks or bulges.

The HPC encourages:

- Semi-annual reviews of buildings and structures to identify maintenance and repair needs
- Prolonging of the life of original materials on historic structures through regular maintenance
- Avoiding replacement of original materials with newer materials

REPAIRS AND REPLACEMENT

When it is no longer feasible to maintain a historic feature, repairs or replacement in-kind may be necessary. Repairs maintain the building in its current condition while making it weather-resistant and structurally sound, concentrating specifically on areas of deterioration. Similar to maintenance, repair costs and effort can be minimized if the problem is addressed quickly, preventing or postponing costly future repairs. As an example, it might be possible to repair an existing wood window rather than incur the much higher expense of replacement windows.

When repair is not possible, the HPC encourages replacement in-kind. Although it is tempting to install newer materials such as vinyl siding or replacement windows, many of these materials are not compatible with historic building systems and can lead to costly future repair needs or an ongoing replacement schedule. In the case of vinyl siding, it can trap moisture within a wall cavity and rot the structural framing.

The HPC encourages:

- Non-intrusive repairs, focused at deteriorated areas, stabilizing and protecting the building's important materials and features
- When repair is not possible, replacement in-kind to the greatest extent possible, reproducing by new construction the original feature exactly – using similar techniques to match the original material, size, scale, finish, detailing and texture
- When replacement in-kind is not possible, the use of compatible materials and techniques that convey an appearance similar to the original feature, similar in design, color, texture, finish, and visual quality to the historic elements

The HPC discourages:

- Introducing modern materials that can accelerate and hide deterioration
- Removing or encapsulating decorative building features such as brackets, spindles, cornices, columns, posts, etc.

HIRING A CONTRACTOR

- All contractors are not necessarily experienced in all materials or working with historic buildings
- Verify extents of warranty for materials and labor
- Check references, especially from 5 years prior, to understand how well their work has held up

SAFETY PRECAUTIONS

Repair and maintenance of a building can potentially be dangerous work. It is recommended that all manufacturers' recommendations be followed and appropriate safety precautions with ladders, tools, materials and processes be taken. Property owners should consult a professional for work that is unfamiliar or potentially unsafe.

Older buildings can have dangerous materials such as asbestos, lead, radon and mold that might be uncovered during work. Property owners should familiarize themselves with these materials and their building's conditions before beginning work. Information about common hazardous materials can be found by contacting the following organizations:

Asbestos
US Environmental Protection Agency Hotline:
(800) 368-5888
New Jersey Department of Environmental Protection: (609) 984-6985
www.epa.gov/asbestos

Lead
National Lead Information Clearinghouse:
(800) 424-LEAD
www.epa.gov/lead

Radon
The National Safety Council's Radon Hotline:
(800) SOS-RADON
www.epa.gov/radon
New Jersey Department of Environmental Protection Radon Section: (800) 648-0394

Mold
Indoor Air Quality Information Clearinghouse:
(800) 483-4318
www.epa.gov/iaq/molds/index.html

Information concerning asbestos and radon are also available though the New Jersey Department of Environmental Protection website at:

www.state.nj.us/dep

For additional questions or information, please contact Hopewell Township's Building and Construction Department at (609) 737-0605 for general questions, or your personal physician for health-related concerns.

BUILDING CODES

In the completion of construction projects, Hopewell Township refers to the *New Jersey Uniform Construction Code, NJUCC*, for non-residential buildings and the *International Residential Code, IRC*, for residential projects. The intent of the *Construction Codes* is to protect the public health, safety and welfare of citizens against the hazards of inadequate, defective or unsafe conditions. The *Construction Codes* address the interior and exterior conditions of buildings, building systems, and the surrounding property.

For specific information regarding the *New Jersey Uniform Construction Code,* and the *International Residential Code*, please contact the Building and Construction Department at (609) 737-0605.

DEMOLITION BY NEGLECT:

The destruction of a building or structure caused by the failure to perform maintenance over a long period of time.

PREVENTIVE MAINTENANCE CHECKLIST

The following pages include preventive maintenance checklists to assist property owners in recording the current condition of their building as well as keep track of maintenance tasks as they are performed. The checklists refer to typical problems associated with various materials and 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 engineer who can recommend an appropriate treatment approach.

It is recommended that homeowners conduct property reviews each spring and fall. The spring review will help identify work that should be completed during the warm weather months while the fall review will assist in the weatherization of a property before winter and the identification of projects to be scheduled for the following year. Areas of deterioration or problems should be photographed during each inspection. Dating of the 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 *Guideline* brochures available at the Township's Building and Construction Department or on the Township web site at www.hopewelltwp.org.

The mineral granules on the asphalt shingles have almost completely worn away. Portions of shingles have broken off and can be found in the gutters and on the ground. Prior patching is evident at the edge of the roof. The top of the roof curves down from the chimney, a possible indication of a structural problem.

Slates are cracked, dislodged and missing. Some of the surfaces are delaminating. Approximately 25 to 30 percent of the slates on this roof are either missing or damaged. Given the pervasiveness of the problems, considering roof replacement would be appropriate.

ROOFING AND RELATED ROOFING ELEMENTS CHECKLIST

As a general rule, roofing and the related elements should be reviewed every spring and fall, corresponding with the regular cleaning of leaves and debris from gutters and downspouts. 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 are best reviewed immediately following a rainfall to determine whether standing water or ponding is present. Great 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. For further information, please refer to the *Guidelines for Roofing*.

MATERIAL / LIFE SPAN	INSPECTION REVIEW	RECOMMENDED ACTION
Slate, Terra Cotta and Cement Tile 50+ years	• Laid on open sheathing or batten strips – verify from attic	☐ If not, provide proper ventilation in attic
	• Broken or missing slates or tiles	☐ Re-attach, re-secure or replace loose or missing units in kind
	• Units delaminating or flaking apart • Slate or tile particles in valleys, gutters and the base of downspouts	☐ Replace deteriorated individual units in-kind ☐ Consider roof replacement when over 20% of units are split, cracked, missing or deteriorated
Asphalt Shingles 20+ years	• Mineral granules in gutters and at the base of downspouts • Mineral granules almost totally worn off single surface • Edges of shingles look worn	☐ Replace deteriorated individual units in-kind ☐ Consider roof replacement when over 20% of units are split, cracked, missing or deteriorated
	• Nails popping up	☐ Re-fasten or replace affected nails
	• Moss or mold forming on roof surface	☐ Clean and treat surface to inhibit future growth ☐ Trim back overhanging tree limbs to allow sun to hit roof surface

Material / Life Span	Inspection Review	Recommended Action
Metal Roofs 60+ years	• Substantial number of rust or corrosion spots • Signs of previous tar patch jobs	☐ Tin, terne coated steel and terne coated stainless all need regular repair and painting every 5-10 years and can last indefinitely if properly maintained ☐ Attempt patching with compatible materials if area of deterioration is isolated ☐ Consider roof replacement if deterioration is substantial or prevalent
	• Punctures in the metal • Broken joints or seams	☐ Attempt patching or re-soldering with compatible materials if area is isolated ☐ Consider roof replacement if deterioration is substantial or prevalent – verify condition of roof substrate
	• Spring in surface of flat metal roof • Ponding or standing water on surface	☐ Consider roof replacement if deterioration is substantial or prevalent
Wood Shingles or Shakes 30+ years	• Laid on open sheathing or batten strips – verify from attic	☐ If not, provide proper ventilation in attic
	• Moss or mold forming on roof surface	☐ Clean and treat surface to inhibit future growth ☐ Trim back overhanging tree limbs to allow direct sunlight onto roof surface
	• Cupping or warping of wood • Individual shingles or shakes are split or uniformly thin from erosion	☐ Replace deteriorated shingles or shake in-kind ☐ Consider roof replacement if deterioration is substantial or prevalent
Flat Roofs	• Bubbles, separation or cracking of the asphalt or roofing felt • Roof feels loose or squishy underfoot • Water ponding on roof • Mineral graduals or gravel worn away • Roofing felt looks dry or cracked	☐ Attempt patching of seams with compatible materials if area is isolated ☐ Consider roof replacement if deterioration is substantial or leaking is observed – verify condition of roof substrate
Flashing (Formed sheet metal at joints or intersections to prevent moisture penetration)	• Loose, corroded, broken or missing flashing • Roofing cement or tar on flashing • Un-caulked openings or gaps at the tops of flashing • Vertical joint does not have both base and counter flashing	☐ Attempt patching with compatible materials if area of deterioration is isolated ☐ Consider roof replacement if deterioration is substantial
Roof Projections (Dormers, vent pipes, cupolas, TV antennae, lightening rods, weathervanes)	• Connections around roof projects are not properly flashed and watertight	☐ Attempt patching with compatible materials if area of deterioration is isolated ☐ Consider flashing replacement if deterioration is substantial

Material / Life Span	Inspection Review	Recommended Action
Chimneys	• Flashing around chimney is not watertight • Mortar joints in chimney badly weathered • Masonry or stucco coating is cracked or crumbling • Chimney is leaning	☐ Attempt patching with compatible materials if area of deterioration is isolated ☐ Re-point deteriorated or open mortar joints ☐ Consider replacement if deterioration is substantial – replacement might necessitate chimney rebuilding from the roof surface up, attempt to replicate all chimney detailing in reconstruction
	• Chimney is not properly capped • Chimney is not properly lined	☐ Install an appropriate chimney cap for the building style ☐ Install a chimney liner if wood-burning fireplaces are used or if masonry inside of flue is crumbling
Gutters and Downspouts	• Clogged gutters or downspouts	☐ Review roof drainage during a rainstorm – water should collect in gutters and flow through downspouts without "spilling over" roof edge ☐ Clean out debris at least twice each year, in the spring and fall, or more based upon accumulation ☐ Install metal screens over length of gutters and/or strainers over downspout locations
	• Rusty, loose, askew or tilting gutters or downspouts • Open or missing seams in hanging gutters	☐ Attempt repair or patching with compatible materials if area of deterioration is isolated ☐ Consider gutter or downspout replacement if deterioration is substantial
	• Broken seams in metal lining of built-in box gutter	☐ Re-solder open joints ☐ Consider gutter and downspout replacement if deterioration is substantial
	• Water ponding adjacent to foundation	☐ Verify water from exiting downspouts is directed away from building foundation – install splash blocks or downspout extensions at base of downspouts ☐ Re-grade area at foundation to direct ground water away from building
Attic Space	• Water stains on rafters or roof boards – probably indicated by either a dark patch on the wood or plaster or possibly a white bloom representing salt crystallization	☐ Review during or immediately following a rainstorm to understand whether staining is a current 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
	• Mildew on underside of roof structure	☐ Verify whether the attic is sufficiently ventilated
	• Broken or missing collar beams • Cracked or sagging rafters	☐ Potential structural problem – consultation with an architect or structural engineer is recommended, particularly if condition worsens

EXTERIOR WOODWORK CHECKLIST

As a general rule, exterior woodwork should be reviewed every spring and fall. The spring review will alert a property owner to damage that occurred over the winter months and allow for immediate repair. The fall review allows a property to be weatherized for winter and allows planning for spring repair and painting.

If there are questions regarding whether the severity of deterioration warrants replacement of an element, consultation with a professional is recommended. For further information, please refer to the *Guidelines for Exterior Woodwork* and *Guidelines for Windows & Doors.*

The siding staining is an indication of mold or algae growth. The shrubs should be removed or thinned to increase ventilation and allow sunlight to strike the wall. The siding is located only 2 to 3 inches above grade making it susceptible to water damage.

MATERIAL	INSPECTION REVIEW	RECOMMENDED ACTION
Exterior Walls – General	• Exterior walls not plumb or vertically straight • Bulges visible at exterior walls • Doors and window frames out-of-square • Siding undulates	☐ Can indicate differential or uneven foundation settlement or severe structural problems – consultation with an architect or structural engineer is recommended, particularly if condition worsens
Wood Siding, Shingles and Decorative Woodwork	• Loose, cracked, missing or open joints at wood siding, shingles or decorative woodwork	☐ Could lead to water infiltration and rot – repair or replace in-kind as appropriate ☐ Apply caulk to open joints – verify compatibility with adjacent materials
	• Thin or worn shingles	☐ Attempt patching with compatible materials if area of deterioration is isolated ☐ Consider replacement in-kind if deterioration is substantial or prevalent
	• Open joints around window and door frames • Open joints between dissimilar materials (such as wood siding and porch roof)	☐ Re-caulk, repair or replace deteriorated flashing as appropriate – verify compatibility of caulk with adjacent materials
	• Mold or mildew on siding or trim, especially on north side or shady areas	☐ Indication of potential moisture problem – verify installation of sufficient vapor barrier in wall ☐ Clean and treat surface to inhibit future growth – do not clean with high pressure water since this could result in more significant problems ☐ Trim back shrubs and overhanging tree limbs to allow air circulation and sun to hit surface
	• Original siding or trim has been covered with vinyl or aluminum siding	☐ Vinyl and aluminum siding and capping can trap moisture and hide rot and damage – if possible, vinyl or aluminum siding and capping should be removed and woodwork repaired

MATERIAL	INSPECTION REVIEW	RECOMMENDED ACTION
Water and Termite Damage	• Signs of dirt veins on exterior walls, particularly near foundation, steps, under porches, etc.	☐ Possible indication of termite damage, contact extermination company to determine if active infestation and extent of damage
	• Wood is soft when stuck with a small blade or ice pick, particularly window sills, porches, steps, sills and siding (Refer to *Guidelines for Exterior Woodwork* for wood rot test)	☐ 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 for potential infestation
	• Wood is located within 6 inches of ground	☐ Wood close to the ground can be a target for rot and termite infestation – review appropriate alternatives and conduct regular inspections
	• Vegetation, such as shrubs, are located immediately adjacent to foundation	☐ 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
Windows and Doors (Refer to *Guidelines for Windows and Doors* for more information)	• Windows and doors do not fit or operate properly	☐ Verify whether frame is wracked or out-of-square – possibly an indication of differential or uneven foundation settlement ☐ Verify whether windows are painted shut and hardware (including sash cord or chains) is operational
	• Wood rot, particularly at sills and lower rails	☐ Repair or selectively replace deteriorated components in-kind ☐ Following repairs, verify deteriorated areas are well painted and joints caulked
	• Weather stripping is deteriorated or missing	☐ Replace with compatible weather stripping – weather stripping is typically located between the door and window and the frame as well as at the meeting rail (where the upper and lower sash abut) of windows
	• Glass is cracked	☐ Replace glazing to match existing
	• Glazing putty is missing, cracked or deteriorated	☐ Replace glazing putty – verify compatibility with adjacent materials
	• Storm or screen windows or doors are missing, deteriorated or non-operational	☐ Repair deteriorated units as appropriate ☐ Consider installing interior storm windows in lieu of exterior – interior storms can minimize potential condensation between the storm and window, reduce drafts, are virtually invisible, and make the exterior more attractive
Painting	• Chalky or dull finish	☐ Surface cleaning might be all that is needed ☐ If repainting, additional preparation might be required
	• Paint surface worn	☐ Wood generally needs repainting every 5 to 8 years
	• Peeling, curling and blistering	☐ Possible indication of a moisture problem – review drainage, potential leaks and whether there is a vapor barrier in the wall ☐ Paint failures near roofs, downspouts and porch ceilings are often the result of drainage problems

EXTERIOR MASONRY AND STUCCO CHECKLIST

Almost all houses include some masonry, if not as a building wall material, then as a foundation or chimney. Since masonry is often used as part of the structural system for older buildings, it is critical that it be maintained to prevent serious problems. For the best results, it is recommended that all masonry and stucco repairs and cleaning be conducted between mid-April and mid-November to minimize potential spalling and problems associated with colder temperatures.

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. For further information, please refer to the *Guidelines for Masonry & Stucco*.

MATERIAL	INSPECTION REVIEW	RECOMMENDED ACTION
Exterior Walls – General	• Cracks in masonry wall	☐ Can indicate differential or uneven foundation settlement or severe structural problems – consultation with an architect or structural engineer is recommended, particularly if condition worsens ☐ Vertical or diagonal cracks or cracks that split individual bricks or stones tend to represent a more significant problem such as differential settlement ☐ Horizontal cracks or hairline cracks limited to mortar joints or individual stones or bricks tend to be less severe ☐ Monitor and photograph condition after repair during each inspection to see if cracks return
	• Bows or bulges in wall plane • Leaning walls	☐ Can indicate differential or uneven foundation settlement or severe structural problems – consultation with an architect or structural engineer is recommended, particularly if condition worsens
	• Water ponding adjacent to foundation • Vegetation, such as shrubs, are located immediately adjacent to foundation • Damp walls • Moss or algae on masonry surface	☐ Verify water from exiting downspout is directed away from building foundation – install splash blocks or downspout extensions at base of downspouts ☐ 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 ☐ Re-grade area at foundation to direct ground water away from building ☐ Clean moss or algae from wall surface with low pressure water, with the possible use of gentle detergent and brushing
	• Efflorescence – water-soluble salts leached out of masonry and deposited on a surface by evaporation, usually as a white, powdery surface	☐ Clean efflorescence from wall surface with low pressure water, with the possible use of gentle detergent and natural bristle brush ☐ Review area for possible additional sources of moisture
Mortar	• Soft and crumbling • Open joints or broken joint bonds	☐ Attempt patching with compatible mortar if area of deterioration is isolated – mortar should match original in appearance, profile, hardness and composition ☐ Consider replacement if deterioration is substantial

Material	Inspection Review	Recommended Action
Stones and Bricks	• Spalling, chipping, flaking, cracking or crumbling of surface • Loose or missing stones or bricks	☐ Attempt patching with compatible materials if area of deterioration is isolated ☐ Consider replacement if deterioration is substantial
	• Pitted surface from sandblasting or pressure wash	☐ Masonry with a damaged surface is more likely to absorb moisture leading to accelerated deterioration – consult a professional and consider appropriate water repellant coating ☐ Monitor and photograph condition to see if it continues to deteriorate ☐ Review adjacent materials and interior finishes for signs of moisture infiltration and rot
Stucco	• Cracks in surface	☐ Attempt patching with compatible stucco if area of deterioration is isolated ☐ Consider replacement if deterioration is substantial ☐ 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
	• Bulges in wall	☐ Verify keying of stucco to lath – if wall area moves when pushed, area of stucco is not bonded and should be replaced with compatible material to avoid potential surface collapse
Painted Masonry	• Chalky or dull finish	☐ Additional preparation might be required prior to repainting
	• Peeling, flaking, curling and blistering	☐ Possible indication of a moisture problem – review drainage, potential leaks and whether there is a vapor barrier in the wall ☐ Paint failures near the roof edge, downspouts, porch ceilings and foundations are often the result of drainage problems
	• Paint surface worn	☐ Similar to woodwork, painted masonry tends to need repainting every 5 to 8 years with compatible paint
Basement or Cellar	• Mortar of walls soft and crumbling • Damp or moldy smell • Evidence of dampness under first floor or around pipes • Evidence of termite damage or other infestation at wood sills on top of foundation walls or first floor joists • Periodic flooding	☐ Review for potential moisture infiltration ☐ Verify water from exiting downspouts is directed away from building foundation – install splash blocks or downspout extensions at base of downspouts ☐ Re-grade area at foundation to direct ground water away from building ☐ Check underground water supply and drainage systems for cracked or clogged pipes ☐ Re-point deteriorated mortar
	• Inadequate insulation below first floor, around pipes, heating and air conditioning ducts, and water heater in unheated basements	☐ Install appropriate insulation – condensation can form on unheated equipment and frozen pipes can burst

PROPERTY CHECKLIST

Exterior maintenance extends beyond a building's perimeter to include the surrounding property. Seasonal property maintenance includes cutting grass, raking leaves and shoveling snow. Larger maintenance issues include water management on the site, trimming trees and regular repairs to fences, walls, walkways and paved surfaces. For further information, please refer to the *Guidelines for Historic Landscapes*.

MATERIAL	INSPECTION REVIEW	RECOMMENDED ACTION
Water Management	• Groundwater directed towards building foundation	☐ Re-grade area at foundation to direct ground water away from building
	• Water ponding adjacent to foundation	☐ Verify water from exiting downspouts is directed away from building foundation – install splash blocks or downspout extensions at base of downspouts
	• Vegetation, such as shrubs, are located immediately adjacent to foundation	☐ Vegetation can trap moisture in wall surfaces by blocking sunlight and reducing air circulation – remove or thin vegetation close to a building or conduct regular inspections for rot, algae, fungus and mold behind vegetation
	• Tree limbs extend over roof	☐ Consider trimming limbs away from house – they provide shade from the sun that can lead to the formation of moss, fungus, mold or algae; leaves and debris collect and clog gutters and downspouts; tree limbs have the potential to cause severe damage if they fall during a storm
Fences and Walls	• Wood fences	☐ Check for deterioration and follow recommendations in the Exterior Woodwork Checklist ☐ Anticipate repainting or re-staining every 5 to 8 years
	• Stone walls	☐ Check for deterioration and follow recommendations in the Masonry and Stucco Checklist
	• Metal fences	☐ Check for rust spots or bare metal – remove rust and prepare for re-painting
Walkways, Patios and Pavers	• Brick, flagstone or concrete pavers cracked or missing	☐ Verify the condition of the sub-base and replace deteriorated or missing units in-kind
	• Water ponding on paved surface • Subsidence of paved surface	☐ Verify the condition of the sub-base and reset individual units to allow appropriate drainage
	• Vegetation growing between individual units	☐ Some vegetation has a substantial root structure that can dislodge individual paving units – remove vegetation if appropriate
Asphalt Paving and Driveways	• Cracked asphalt	☐ Seal cracks to minimize potential water infiltration ☐ Consider sealing or repaving entire surface if cracks are substantial or prevalent
	• Water ponding on paved surface • Subsidence of paved surface	☐ Verify the condition of the sub-base and patch to allow appropriate drainage

Problems with the downspout have resulted in deterioration of the mortar joins and efflorescence and staining of the brick surface. The projecting water table has been previously patched with stucco and the paint is peeling from both the water table and foundation below. There have been various repointing efforts of the brick as evidenced by the different mortar colors and joint styles.

MAINTENANCE MANUAL

It can be helpful for homeowners to develop a maintenance manual to keep track of conditions, problems, maintenance tasks and contractors who performed the work. This outline of conditions will assist property owners in diagnosing problems, prescribing remedies, and tracking the effectiveness of those remedies in a similar manner that a physician tracks a patient's health. The information in the manual generally falls into three categories:

1. General information
2. Documentation
3. Inspection and maintenance requirements

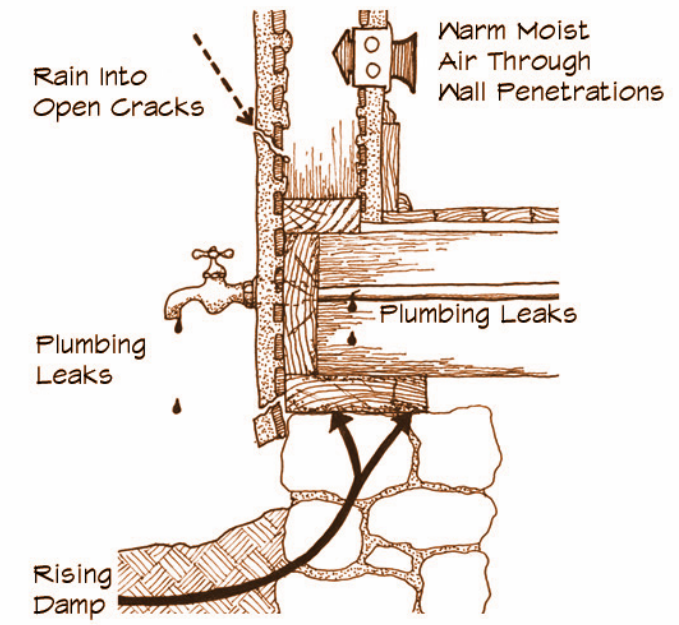
1. General information should include the names and telephone numbers for emergency services and repairs, as well as basic information on specific building equipment. This includes:
   - Address and tax parcel or block and lot number
   - Telephone numbers and addresses for:
     Fire Department
     Police Department
     Department of Building and Zoning
     Contractors
     Electrician
     Electric Company
     Gas Company
     Water Company
     HVAC Repair (Heating, ventilation and air conditioning)
   - Diagram locating electrical disconnects and various utility cut-offs (such as water and gas)
2. Documentation information should include historical, construction, alteration and legal information that is specific to the property's past and current conditions. This includes:
   - Architectural drawings and specifications of original construction or later additions or alterations as available
   - Historic photographs and photographs of existing conditions and dated inspection photographs (as referred to in the Checklists)
   - Construction records including all contracts, bonds, guarantees, equipment data and operating instructions
   - Copies of deeds and other legal documents including covenants and easements
3. The third major component is the preventive maintenance checklists, which should outline the following:
   - Items to be inspected
   - Frequency of the inspections for various components
   - Information on particular repair and upkeep techniques of particular components, materials and equipment

Since the maintenance manual should be updated regularly to be the most effective, it might be helpful to keep this information in a three-ring binder. This information can assist a homeowner keep abreast of new and ongoing problems before they become costly emergency repairs.

MOISTURE

Typically moisture is the primary agent of decay in a building. No matter how "waterproof" a building is, water vapor will find its way into the structure. When moisture saturates a building's materials, it can:

- Make wood desirable as a food for insect and plant consumption
- Promote the growth of mold, algae and fungi
- Cause building materials, particularly wood and masonry, to swell when wet, exerting additional pressures, particularly during freezing temperatures
- Compromise the structural integrity of the building
- Cause chemical reactions that might deteriorate materials by transmitting salts and minerals through walls, particularly in masonry
- Damage or destroy interior finishes and furnishings



Rain and Precipitation *can enter the exterior envelope through damaged or cracked surfaces and crevices with adjacent materials including window and door frames.*

Rising Damp *is the migration of moisture from the soil into the building structure through capillary action. The soil adjacent to the foundation can become saturated through improper drainage from gutters and downspouts and vegetation planted adjacent to the foundation.*

Plumbing Leaks *include piping as well as bathroom fixtures, kitchen and laundry appliances, and underground piping.*

Condensation *occurs when warm moist air from bathrooms, kitchens and laundry facilities comes in contact with cold surfaces and changes to water droplets.*

INSULATION AND WEATHERIZATION

Insulation can be an effective means of controlling heat loss in a building. There are three general types of insulation:

- Rigid board insulation
- Fiberglass batt insulation
- Blow-in insulation – includes fiberglass, rock wool and cellulose

When combined with a vapor barrier, integral on most batt insulations, insulation can reduce moisture migration through a building's envelope. (In this climate, it is generally recommended that the vapor barrier is installed between the livable space and the insulation. When installing batt insulation in an attic floor installation, the vapor barrier should be facing down and the fiberglass batts exposed within the attic.)

In addition to the attic and walls, it is also important to insulate the perimeter of the cellar or crawlspace or the underside of the first floor framing. Before installing insulation, all cracks and openings should be caulked or sealed, and if the cellar or crawlspace will not be heated, the water heater and exposed piping and ducts should be insulated.

To minimize the potential for trapped moisture, it is critical that moisture problems or leaks be addressed before installing insulation. Typical areas of concern are adequate attic, kitchen, bathroom and laundry area ventilation as well as any areas of leaks or condensation.

The HPC encourages:

- Remedying moisture problems before insulating
- Installing adequate ventilation in attics, bathrooms, kitchens and laundry areas

A common area of concern for heat-loss is windows. It is important to verify windows operate and sit properly in their frames, the frame perimeters are caulked, and weather stripping is installed around each sash. Storm windows can greatly increase the thermal efficiency of windows, with wood exterior storm windows or interior storm windows generally being the most appropriate for historic houses. Interior storm windows can be very airtight, substantially reduce condensation and are generally removable during warm weather.

The HPC encourages:

- Making windows operable and sit properly in frames, and caulking open joints around windows
- Installing interior storm windows

PAINTING

Paint is one of the most common ways to protect exterior materials from the elements. When the painted surface has been compromised, moisture and the elements can infiltrate the underlying material and accelerate potential deterioration.

In general, exterior surfaces should be repainted every 5 to 8 years, with potential touch-ups of high traffic, worn or deteriorated areas. If the frequency of complete repainting is greater, there might be an indication of another problem such as:

- Presence of excessive moisture
- Paint was applied with inadequate surface preparation or under adverse conditions
- Paint is not compatible to underlying material or previously applied paint

When considering repainting, the following five steps are recommended:

1. Determine whether painting is necessary: Prior to beginning a painting project, it is appropriate to determine whether complete repainting is necessary or if cleaning and/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
- Blistering – cut into blister, and if wood is visible the problem is probably moisture related; if paint is visible, the problem area was probably painted in direct hot sun
- Wrinkling – typically the result of the top coat drying before the underlying coat; sand surface smooth and repaint
- Cracking or crazing – 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
- Alligatoring – severe cracking and crazing; remove all paint down to bare wood

3. Repair causes of failure: Before repainting, paint failure caused should be repaired. A substantial amount of paint failure is due to moisture problems such as: areas near rooflines, gutters and downspouts; areas near the ground; horizontal surfaces such as window sills; and moisture migration through exterior walls from kitchens, bathrooms and laundry rooms.

4. Prepare surface: To insure a long-lasting painted surface, appropriate surface preparation should be undertaken before repainting.

- Begin by washing the painted surfaces with a mild detergent solution and natural bristle brushes, then 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 thoroughly dry before applying primer or paint
- Spot prime bare wood, areas of repair and wood replacement

5. Repaint: High quality paint 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.

- Apply paint during appropriate weather conditions, generally 50˚F and 90˚F, less than 60% relative humidity, avoiding direct sunlight

The paint on this door has alligatored, and severe cracking is visible. Removal of paint down to bare wood and proper door repair are recommended before repainting

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.

- Always wear safety goggles
- With heat tools, always wear appropriate clothing and keep a fire extinguisher nearby
- Paint dust from older buildings can contain lead – wear a dust mask, avoid open food or beverage containers in area of paint removal, and thoroughly clean exposed skin and launder work clothes

STRIPPING PAINT

If the existing paint has failed, it might be necessary to strip all or portions of the paint from the surface. Although there are a variety of tools and chemicals available to strip paint, many of them are potentially hazardous and can cause significant damage to exterior surfaces. All manufacturers' recommendations should be followed during the paint removal process.

The HPC encourages:

- Hand washing with a mild detergent and natural bristle brushes
- Hand scraping
- Hand sanding

The HPC suggests great care if using:

- Rotary tools – disks can leave circular marks and wires can tear into surface
- Heat guns and heat plate – can ignite paint if left in one location too long
- Chemical paint removers – 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

The HPC strongly discourages:

- Flame tools such as blowtorches to soften paint – smoldering sparks can start a potentially devastating fire; lead components in paint can vaporize and create highly toxic fumes
- Sandblasting – can be abrasive to surface and wear away protective exterior coating
- High pressure water wash –forces water into open joints affecting interior finishes and structural framing; can be abrasive to exterior surface

PAINT COLORS

Paint colors can highlight a building's architectural features and reflect personal taste. Generally, Colonial Revival homes would historically have a two-color paint scheme; Victorian homes might have a three or four-color, earth-tone, paint scheme. The following book addresses appropriate historic building paint colors:

Moss, Roger W. ed. *Paint in America: The Colors of Historic Buildings*. New York: John Wylie & Sons, 1995.

HISTORIC PRESERVATION OFFICE

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Dominique M. Hawkins, AIA, of Preservation Design Partnership in Philadelphia, PA, prepared this publication.