Implementing Preventive Architectural Conservation: Do Historic Property Stewards in the United States Possess the Tools to Meet the Challenge?

Alice Louise Finke

University of Pennsylvania

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Implementing Preventive Architectural Conservation: Do Historic Property Stewards in the United States Possess the Tools to Meet the Challenge?

Abstract
This study examines the role in the United States of a preventive approach—termed "preventive conservation" for the purposes of this thesis - towards the care for cultural heritage, specifically cultural heritage as represented by historic buildings interpreted as historic house museums. Sixty professionals, including executive directors, curators, and conservators from across the country, responded to a survey in which they were asked to consider conservation terminology, approaches, and implementation as applied to their organization's approach towards the care for its historic buildings. Through the analysis of these responses, the research questions that this thesis seeks to answer are: Do historic house museum stewards in the United States embrace and implement a preventive approach, and how might they be better equipped to do so? To enrich the study with a broader context for comparison, "best practices" of the international community in preventive conservation of historic buildings have been identified.

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IMPLEMENTING PREVENTIVE ARCHITECTURAL CONSERVATION:
DO HISTORIC PROPERTY STEWARDS IN THE UNITED STATES POSSESS THE TOOLS TO MEET THE CHALLENGE?

Alice Louise Finke

A THESIS

In

Historic Preservation

Presented to the Faculties of the University of Pennsylvania in Partial Fulfillment of the Requirements of the Degree of

MASTER OF SCIENCE IN HISTORIC PRESERVATION

2008

____________________     ____________________
Advisor       Program Chair
Michael C. Henry, PE, AIA     Frank G. Matero
Adjunct Professor of Architecture     Professor of Architecture
Dedication

To my parents, Bill and Claudette, for their unwavering support of all my pursuits.
Acknowledgements

The production of this thesis truly has been a collaborative process; without the assistance, insight, and support of dozens, it would not have been possible.

I would like to thank first and foremost both my thesis advisor Michael C. Henry, PE, AIA, Adjunct Professor of Architecture, and my thesis reader Dr. Thomas H. Taylor, Jr., PhD, FAIC, FAPT, Director, Architectural Collections Management and Conservation, The Colonial Williamsburg Foundation. Michael Henry’s guidance has been invaluable throughout the thesis process. As an engineer, architect, and professor, his passion for ensuring the longevity of the historic built environment by exploring the underlying causes of apparent and anticipated effects, is contagious and truly an inspiration. I feel privileged to have worked with him, and look forward to our collaboration in future preservation pursuits.

Dr. Thomas Taylor has patiently waded through various chapter drafts. His perspective as an architectural conservator (first with the National Park Service, and then with The Colonial Williamsburg Foundation), and as an active member of the American Institute of Conservation (AIC) and Association for Preservation Technology (APT), has provided depth to this thesis.

International perspectives—from the Netherlands, Flanders, and Britain—have strengthened the chapter on existing models of preventive conservation programs. Franca van der Horst, Secretary of Monuments Watch Netherlands, graciously provided me with information on Monuments Watch; and Jane Girbes of Monuments Watch Utrecht kindly supplied a sample Monuments Watch Utrecht inspection report. I am also grateful to Anouk Stulens, Director, Monuments Watch Flanders, and Professor Dr. Annemarie Draye, Universiteit Hasselt,
Belgium, who both shared the Belgian perspective, and Dr. Mario E. Santana Quintero, Faculty of Engineering, Katholieke Universiteit, Raymond Lemaire International Center for Conservation, Leuven, Belgium, who put me in contact with them. Belgian stewardship was kindly illuminated for me by Jozef Braeken, Director of the Renaat Braem House, and Ingrid Desnouck, Curator of the Horta Museum, with whom I had the pleasure to correspond thanks to the recommendations of Dr. Koenraad Van Balen, Faculty of Engineering, Katholieke Universiteit, Raymond Lemaire International Center for Conservation, Leuven, Belgium, and Neza Cebron Lipovec, Raymond Lemaire International Center for Conservation, Leuven, Belgium. Thanks are also in order to Sarah Staniforth, Historic Properties Director, The National Trust (UK) for her insight into that organization’s management. Too, I would like to acknowledge Dr. Linda Watson, School of Architecture and Design, University of Plymouth, for her informative talk on historic preservation in Britain during the University of Pennsylvania European Conservation Summer School, 2007. Additionally, Kate Clark, Former Deputy Director of Policy and Research, Heritage Lottery Fund, provided further insight into historic preservation in Britain during her lecture titled “Ten Things I’ve Learned,” given at the University of Pennsylvania in March 2008. I must also recognize the comprehensive nature of the reports published by Maintain Our Heritage, making personal interviews discussing the efforts to establish a Monuments Watch in the UK unnecessary.

While I am unable to cite the 60 individuals by name as a result of confidentiality agreements, I most graciously thank all of the American survey respondents. Without their willingness to share their insights on the role of preventive conservation / maintenance
within the management of their respective institutions, I would not have had a thesis.

Further, I would not have had a sufficient sampling of institutions without the permission of the American Association of Museum’s Historic House Museum Professional Interest Committee to utilize their on-line directory. Their webmaster Robert was most helpful throughout the process. Too, Walter Henry, Conservation DistListCoOL, ensured that the survey was distributed to a wide audience on the Conservation On-line (CoOL) list-serve; Museum L also graciously circulated the survey.

My Penn preservation friends with whom I have shared many long hours at the library have made the thesis process bearable. Alex Bevk, Caroline Cheong, Nicole Collum, Catherine Wood Keller, Betsy Kleinfelder, Paula Kulpa, Sara McLaughlin, Suzanne Segur, and Emily Wolf have made me smile. Fellow Michael Henry advisees Jenna Cellini and Anita Franchetti have provided encouragement. Marco Federico’s antics and humor, especially during the final days of formatting, have been a welcome distraction. Maureen McDougall kindly proof-read the thesis document for spelling errors, incorrect verb tenses, and inappropriate punctuation. Sipping Wawa shakes with John Nelson in the Sansom Place East living room was the perfect reward after a long day and night working. Further, I would be amiss if I did not thank Frank Furness for designing the inspirational study space that is the Anne and Jerome Fisher Fine Arts Library at the University of Pennsylvania. Time in the window-less studio space in Meyerson Hall and my humble efficiency in Sansom Place East have allowed me to appreciate Furness’ fine architecture all the more.

Finally, heartfelt thanks to: Frank Matero, Professor of Architecture and Chair, Graduate Program in Historic Preservation; Michael Henry; and Dr. Mario Santana Quintero for
supporting my participation in the Seminar on PREventive COnservation and Monitoring of
the Architectural Heritage (SPRECOMAH) in Val de Loire, France where I will present my
thesis findings 25-30 May 2008; and to the SPRECOMAH committee, including Dr.
Koenraad Van Balen and Neza Cebron Lipovec, for inviting me to contribute to the
conference. I am most fortunate.

Alice L. Finke
Philadelphia, PA
3 May 2008
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Chapter 1  
Preventive Conservation and the Care for Cultural Heritage

I. Topic and Definitions

Purpose

This study examines the role in the United States of a preventive approach—termed “preventive conservation” for the purposes of this thesis—towards the care for cultural heritage, specifically cultural heritage as represented by historic buildings interpreted as historic house museums. Sixty professionals, including executive directors, curators, and conservators from across the country, responded to a survey in which they were asked to consider conservation terminology, approaches, and implementation as applied to their organization’s approach towards the care for its historic buildings. Through the analysis of these responses, the research questions that this thesis seeks to answer are: Do historic house museum stewards in the United States embrace and implement a preventive approach, and how might they be better equipped to do so? To enrich the study with a broader context for comparison, “best practices” of the international community in preventive conservation of historic buildings have been identified.

Care for Cultural Heritage

Irrespective of international borders, cultural heritage management—whether of a single object or monument, a collection of historic houses, or an entire landscape—aspire to care
for and extend the longevity of cultural heritage assets that have been so identified because of their reflectance of historical, artistic, ecological, and/or general “cultural” values. The professionalization of cultural heritage management became possible with the popularization of museums in Europe by the early 19th century, and in the United States by the late 19th century. It was not long until the public policy of many European countries, as well as supporting international charters (chief among them the 1931 Athens Charter and the 1964

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1 In this thesis, “culture” is defined as those established commonalities within a group of people, such as within a social, religious, and/or ethnic group; these groups of people may be dependent or independent of geographical placement and/or time. Commonalities may include arts and sports traditions, political views, belief systems, and other traditions. The “culture” with which the creators and/or users of tangible elements (like works of art or architecture) identify ascribes meaning to these elements through association, hence giving these elements “cultural” value. The definition presented here is based upon definitions of “culture” presented by Merriam-Webster in entries 5b-d: “b: the customary beliefs, social forms, and material traits of a racial, religious, or social group; also : the characteristic features of everyday existence (as diversions or a way of life) shared by people in a place or time <popular culture> <southern culture> c: the set of shared attitudes, values, goals, and practices that characterizes an institution or organization <a corporate culture focused on the bottom line> d: the set of values, conventions, or social practices associated with a particular field, activity, or societal characteristic <studying the effect of computers on print culture> <changing the culture of materialism will take time — Peggy O’Mara>” [source: http://www.merriam-webster.com/dictionary/culture 8 April 2008].


3 The 1931 Athens Charter, adopted at the First International Congress of Architects and Technicians of Historic Monuments in Athens, presents seven conservation resolutions, followed by seven general conclusions that expand upon the resolutions. First and foremost it must be noted that Conclusion VII cites that it is the duty of a government to ensure for its people the protection of historic sites. Conclusion VII states that “the question of conservation of the artistic and archaeological property of mankind is one that interests the community of the States [of the League of Nations, of which the United States was not a member], which are wardens of civilization.” [source: www.icomos.org/Athens_charter.html]. Among its resolutions, the Athens Charter calls for (1) the establishment of “international organizations for restoration on operational and advisory levels”; (2) the consultation of field experts in restoration projects; (3) the organization of national legislation in all countries; (4) the reburial of sensitive sites for protection; (5) the allowance of the “judicious” use of modern techniques; (6) the arrangement of “strict custodial protection”; and (7) the consideration of the protection of surrounding areas [source: Ibid]. The collaboration between international, national, and local governing bodies, field experts, historic site managers, and the public, as well as general conservation standards (that include documentation, analysis, treatment, respect of different historical styles, consideration of location,
Venice Charter),\(^4\) enhanced the enthusiasm for cultural institutions, pledging to safeguard

*immovable* cultural property (buildings and large monuments like outdoor statuary) deemed of historic and artistic significance, in some cases without regard to private or public ownership. The acquisition, presentation, conservation, and research of cultural heritage property were, in a sense, legitimized in Europe. Although the United States federal government never officially adopted the Athens or Venice Charters, it nonetheless followed the European and international examples with its own cultural heritage policies for the care of the natural and built environment: the establishment of Yellowstone National Park in 1872, the 1906 Antiquities Act,\(^5\) the 1935 Historic Sites Act,\(^6\) and ultimately, the 1966 National Historic

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\(^4\) The 1964 Venice Charter, authored by twenty-three persons representing fifteen countries (not including the United States), the Vatican, UNESCO, and ICCROM, clarifies some aspects of the Athens Charter. A preamble of assumptions, much like Section 1 of America’s Historic Sites Act of 1935, begins the document. The assumptions include: the acknowledgement that the public is increasingly concerned with the preservation of their history for the present and future generations, and that the international community should agree on preservation principles that each country should apply as it sees fit. The Charter continues by outlining sixteen articles, which include all previous resolutions/consideration as outlined in the Athens Charter. Those articles which are new since the Athens Charter include the first article, which defines what constitutes a “historic monument” as the tangible object and its setting “in which is found the evidence of a particular civilization, a significant development, or an historic event.” \(\text{[source: www.icomos.org/venice_charter.html]}\). The fourth article stresses that monuments be “maintained on a permanent basis;” the sixth presents the importance of the preservation of scale; the seventh discourages movement of the monument; articles nine, twelve, and thirteen mandate that new materials and additions be distinct from the historic \(\text{[source: Ibid]}\). The United States has not officially adopted the Venice Charter. \(\text{[source: Alice Finke, Final Exam in “Preservation Through Public Policy,” Graduate Program in Historic Preservation, University of Pennsylvania, Spring 2007.]}\)

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\(^5\) The 1906 Antiquities Act authorized Presidential proclamation and protection of federally-owned historic sites. \(\text{[http://www.nps.gov/history/local-law/anti1906.htm]}\).

\(^6\) The Historic Site’s Act of 1935 (as amended) expands upon the 1906 Antiquities Act, clarifies the duties of the National Park Service as established in 1916, and echoes the Athens Charter’s third and sixth resolutions calling for national legislation on the protection of historic sites. It must be noted that Section 1 of the Historic
Preservation Act (NHPA) with its subsequent amendments. Policy pertaining to the necessity of protection for historic immovable property was thereby established in Europe and America, although the specific approaches to care were to be debated.

**Approaches to the Care of Cultural Heritage in the United States**

The 1966 National Historic Preservation Act (NHPA) officially established the American federal government’s position on historic preservation, thereby influencing state and local policy and the American preservation field as a whole. “Historic preservation,” synonymous with the internationally-accepted definition of “conservation” (Appendices A and B), is defined in the NHPA as encompassing all activities that potentially affect cultural resources:

- identification, evaluation, recordation, documentation, curation, acquisition, protection, management, rehabilitation, restoration, stabilization, maintenance, research, interpretation, conservation, and education and training regarding the foregoing activities, or any combination of the foregoing activities.7

Sites Act declares it federal policy “to preserve for public use historic sites, buildings, and objects of national significance for the inspiration and benefit of the people of the United States,” a values-based approach which was alluded to in the Athens Charter, Conclusion VII [source: www.cr.nps.gov/local-law/FHPL_HistSites.pdf]. More importantly, the Historic Sites Act establishes the Secretary of the Interior, through NPS, as the presiding federal body to oversee the protection of not only federally-owned historic sites, but also non-federally-owned historic sites. The basis for the National Historic Landmarks program is thereby established. Further, NPS is here charged with the survey of the United States for nationally significant properties, and compilation and archiving of research on historic sites. Also considered mandatory in this Act are cooperative agreements between states, municipalities, private businesses, and individuals to oversee protection of historic properties. The historic commemorative plaque program and the pledge to establish other education-based programs are additional stipulations (source: Ibid). [source: Alice Finke, Final Exam in “Preservation Through Public Policy,” Graduate Program in Historic Preservation, University of Pennsylvania, Spring 2007.]

Out of the NHPA and its subsequent amendments came: a defined relationship with the international community;\(^8\) the National Register of Historic Places (NR); the Advisory Council on Historic Preservation (ACHP);\(^9\) the State and Tribal Historic Preservation Offices (SHPO and THPO) and Certified Local Governments (CLG); Section 106 Review;\(^{10}\) Historic Preservation Fund (HPF); National Center for Preservation Technology and Training (NCPTT); and the Secretary of the Interior’s Standards for the Treatment of Historic Properties (SIS).\(^{11}\) In the SIS, NPS has identified four distinct approaches for treatment of cultural heritage assets of the built environment: “preservation,”


\(^9\) The ACHP advises the federal government in all actions involving federal historic properties as prescribed by Section 106 in the NHPA, although the advice is not legally binding.

\(^{10}\) Section 106 of the NHPA states that the federal government must strive to preserve all federally-owned properties listed on and eligible for the National Register of Historic Places.

\(^{11}\) The NHPA Amendments of 1980 [16 U.S.C. 470a(h)-Preservation standards for federally owned properties] paved the way for the formation of the Secretary of the Interior’s Standards for Preservation, Rehabilitation, Restoration, and Reconstruction, which very much complement the conservation standards stated in the Athens and Venice Charters. The general principles focus upon the idea that the historic use, materials, form, scale, and setting are to be respected, and if any changes are proposed (in the case of preservation and rehabilitation), they should be kept to a minimum and compatible yet distinguishable from the historic fabric. Treatments are to be undertaken using the gentlest means possible [source: http://www.nps.gov/history/bhp/tps/standguide/overview/choose_treat.htm]. [source: Alice Finke, Final Exam in “Preservation Through Public Policy,” Graduate Program in Historic Preservation, University of Pennsylvania, Spring 2007.]
“rehabilitation,” “restoration,” and “reconstruction”\textsuperscript{12} (Appendices A and B). Each of these approaches addresses the asset’s physical fabric: “preservation” retains all fabric; “rehabilitation” updates or adapts a property for new uses while retaining fabric believed to be of primary significance; “restoration” retains that fabric which reflects a prescribed period of significance; and “reconstruction” recreates fabric from a period of significance. The SIS does not identify preventive care as a separately defined approach, instead including preventive care under “preservation” activities in the form of maintenance.

It may be argued that “preservation,” “rehabilitation,” “restoration,” and “reconstruction” are not the only approaches to cultural heritage care, and that, in addition to preventive care, “protection” and “stabilization” are valid approaches as well; the latter approaches were included in early versions of the SIS,\textsuperscript{13} and are currently identified and utilized by the Colonial Williamsburg Foundation (CWF) (Appendices A and B). Abstention is advocated by many. It is interesting to note that neither the CWF nor the American Institute for Conservation of Historic and Artistic Works (AIC) officially recognize in their terminology the approach of “reconstruction,” because many members of both organizations argue that reconstruction is actually new construction and not a conservation treatment. In addition, AIC does not address “rehabilitation,” presumably because “use” of moveable property,

\textsuperscript{12} The unique circumstances of each cultural asset dictate whether preservation, rehabilitation, restoration, or reconstruction is appropriate.

\textsuperscript{13} Source: Dr. Thomas H. Taylor, Jr., PhD, FAIC, FAPT, Director, Architectural Collections Management and Conservation, The Colonial Williamsburg Foundation.
such as objects, might be considered to be consumptive, and therefore antithetical to longevity. The ambiguity of terminology and the philosophical differences with regard to the range of approaches, however slight, prove that there is not consensus among cultural heritage professionals for the proper terminology to address different approaches to care for the built heritage.

**Conservation vs. Preventive Conservation**

Regardless of the terminology of choice to qualify approaches to cultural heritage care, “conservation” activities factor into each approach, no matter if the cultural heritage property is movable (objects) or immovable (buildings and monuments). Although the definition endorsed by AIC addresses “conservation” in terms of its overarching application as a profession: “... conservation activities include examination, documentation, treatment, and preventive care, supported by research and education,” for the purposes of this thesis, “conservation” shall be simplified to be synonymous with:

“interventive treatment conducted on the cultural heritage property to ensure its longevity so that it may communicate its cultural significance to future generations” (Appendices A and B).

An example of “conservation” in practice will serve to illustrate its application: an object in a museum collection may suffer from one or more deterioration phenomena that compromise the object’s appearance and survival, the object’s very ability to communicate its cultural value. In the interest of correcting damage, slowing deterioration, and/or improving its aesthetics, the curator, conservator, conservation scientist, and/or collections administrator may decide to remove the object from its environment and conserve (treat) it. Conservation
may include in-painting, consolidation, and/or cleaning that may be followed by the
application of a protective varnish. The conservation in this case, for the purposes of this
thesis, is considered to be “interventive.” Interventive treatments do not necessarily result in
removal of the causative factors of the problem(s), and once conserved, the object might
very well return to an environment that subjects it to further deterioration, likely requiring
future interventions, thereby establishing a “reactive” pattern of treatment. In the case of
the conservation of immovable cultural property, the property has never left the
environment that may be subjecting it to further deterioration, and the environment has not
been altered to slow the deterioration.

By contrast, a preventive, and therefore proactive, approach would be to examine the
environment of the movable or immovable cultural property for all possible factors that might
enable deterioration to occur. This informed examination would enable the identification of
the probable factors (change in moisture, change in temperature, presence of nutrients for
organic materials, etc.) and the opportunity to mitigate or reduce the availability of those
factors, in order to promote the longevity of the object. Examination may necessitate
monitoring for risk factors by the application of devices to track changes in temperature,
relative humidity, moisture, and movement. Or quite simply, it may involve the informed
frequent observation of the property during different climatic conditions. Recording tools
to document these observations could vary from the low-tech to the high tech, from digital
photography and checklists/notes, to laser scanning and the use of imaging software and
database tools such as Autodesk AutoCAD, Microsoft Access Database, and ArcMap
Geographic Information Systems (GIS). Whether simple or advanced techniques are used

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to determine the availability and intensity of probable factors enabling deterioration, the property steward’s frequent, informed observation and recordation is critical for a successful preventive conservation approach.

**Preventive Conservation vs. Maintenance**

As explained in the previous paragraphs, for the purposes of this thesis, “preventive conservation” is distinguished by the property steward’s frequent, informed observation and recordation of the tangible cultural heritage, thereby differentiated from the interventive, reactive approach of “conservation.” Whereas the fine distinction of the terminology is debatable, and shall be discussed at length throughout this thesis, the concept of “preventive conservation” as it pertains to buildings may well be traced to as long as humans have roamed the earth, building shelters for themselves and their families. Out of practicality, the longevity of a structure in use was, and still is, desirable. The need for, and use of, a structure changes over time, however. Although movable cultural property may be transported to other locations when it is no longer needed in its long-time home, immovable cultural property is tied to its setting, unless great effort and expense is spent in transport. Therefore, because of its sheer size, scale, and capacity for use, the continued care of immovable cultural property is made even more challenging.

In the field of movable cultural property, “preventive conservation” is the accepted term used for the preventive approach, distinguishing it from the reactive approach of “conservation,” and emphasizes environmental monitoring and subsequent adjustment for desired results (Appendices A and B). In the field of immovable cultural property, however,
the phrase “preventive conservation” has been more commonly used in Europe, while “maintenance,” “preventive maintenance,” and “cyclical maintenance” have been more commonly used to refer to preventive approaches in the United States. Given the differences in application, for the purposes of this thesis, the following definitions will be used with reference to immovable cultural property (Appendices A and B):

*Maintenance* refers to actions of servicing and repair that are *scheduled in response to degradation or failure*, i.e. after a rainstorm, clearing clogged, overflowing gutters, or replacing missing roof tiles. The objective of maintenance is to regain utility.

*Preventive Maintenance* refers to *scheduled actions of servicing and repair to stave off “incipient” failure*, i.e. before a forecasted rainstorm, clearing clogged gutters or securing loose roof tiles. The application of “preventive maintenance” to industrial equipment is well-known.

*Cyclical Maintenance* is distinguished by actions of servicing and repair that are *anticipated* and therefore *scheduled a year or more in advance*, often in coincidence with the seasons, i.e. after leaves have dropped in autumn, assuring that gutters are free of clogs and that roof tiles are secured and cleaned of bio-growth.

*Preventive Conservation* is a proactive philosophy aiming to ensure the longevity of the culturally-significant built environment. Measures that mitigate decay, including the

\[ \text{http://en.wikipedia.org/wiki/Preventive_maintenance} \ 9 \text{April 2008.} \]
realization of cleaning and coating programs and design nuances (like installation of metal strips along rooflines to prevent bio-growth), appropriate to the building’s history, context, and use, may be considered as preventive measures. Central to the philosophy of preventive conservation is the establishment of an accessible and comprehensible system for the recordation of the historic property stewards’ frequent, informed observation of building conditions, enabling the steward to minimize probable deterioration risk factors. An example of preventive conservation is to examine on a frequent basis the building materials in proximity to the gutters, as well as the roofing materials, considering all potential causes of future damage. From the list of potential causes may be determined the probable causes. Not only considered would be the damage from water originating from clogged gutters and roofs, but also, for example, the damage resulting from the retention of wind-driven rain that may be enabled by known inherent vulnerabilities in the masonry and design, and compounded by freeze-thaw cycling.

Conservation is a reactive and interventive treatment philosophy to correct the effects of damage or deterioration upon the culturally-significant built environment through the implementation of periodic or episodic repair and restoration. Strategic monitoring of conditions, and frequent, informed observation may or may not be addressed in any follow-up work. An example is to replace a roof in-kind; and treat the area around the gutters (re-pointing of masonry walls, removal of bio-growth and metal staining using the gentlest means possible, consolidation, etc.) damaged from water saturation from overflowing gutters and repeated freeze-thaw cycles.
The terms “preventive maintenance” and “cyclical maintenance” do imply preventive action based on projected or historically-based intervals that will forestall known deterioration mechanisms before they can cause significant damage to the resource. However, there is no requirement for periodic monitoring or observation of conditions between scheduled or cyclical actions.

“Preventive conservation” considers all possible factors for deterioration and narrows the field to probable factors, through the property steward’s informed, frequent examination and documentation of the historic built environment.

II. Justification

A review of the literature on preventive conservation reveals that more so than for immovable cultural property, preventive conservation strategies for moveable cultural property have been extensively explored and developed; this contrasts with preventive conservation for immovable property, on which the literature is practically silent.

The extent to which preventive conservation has been embraced by professionals in the field of movable cultural property is evident by the abundance of literature on the subject, including international conference proceedings and museum- and conservation-specific periodicals. These literature sources reveal that the International Center for the Study of the Preservation and Restoration of Cultural Property (ICCROM), the Getty Conservation Institute (GCI), and such European institutions as The National Trust (UK), have led the way in the application of the shift from reactive to preventive conservation for moveable heritage, including that heritage housed within historic buildings. Regarding the United
States, national leaders in the preventive conservation field as it refers to moveable heritage include the GCI, NPS, and AIC. Common themes in the published literature on preventive conservation for moveable property include collections risk factors\textsuperscript{15} such as relative humidity levels, temperature levels, light levels and exposure time, air pollution levels, and public access; and the threat of pests, fire, flood, and seismic activity. Because many of these concerns are affected by larger environmental contexts and their moderation by the building envelope, it follows that environmental management within historic buildings and the implications for the historic building fabric, followed by attention to the building fabric itself, have entered the literature as well.\textsuperscript{16} Of note in this regard is the New Orleans Charter in 1990 which advocated a balanced approach to creating low-risk collections environments inside historic buildings. More recently in the United States, a preventive conservation philosophy is being articulated for the historic building fabric.\textsuperscript{17} However, preventive conservation in the building context seems to be pre-empted by existing terminology such as “maintenance,” “preventive maintenance,” and “cyclical maintenance,” and the philosophies associated with them (Maintain Our Heritage 2003, Feilden 1994, Chambers 1976, NPS


Preservation Briefs 1975-present). This is unfortunate, because as this thesis will demonstrate, there are fine and important distinctions in which preventive conservation is set apart from, and is more effective than, the more conventional philosophies and their practices.

In light of the development of preventive conservation for immoveable property in Europe, and the emergence of an advocacy for the approach in the United States, it is timely to investigate what is needed to advance the implementation of this preservation philosophy for historic house museums.

III. Questions

Among the questions to be addressed by this thesis are:

(1) To what extent are preventive architectural conservation strategies established and implemented as a crucial component to management plans for historic house museums in the United States as compared to the existing models in the Netherlands, Belgium and England?

(2) How do ownership, staffing, training, professional collaboration, and finances affect the implementation of preventive architectural conservation strategies?

(3) How can the implementation of preventive architectural conservation strategies be improved in the United States, and who should be the key players?
V. Hypothesis

It is hypothesized that a successful preventive architectural conservation strategy will be:

(1) defined and outlined in a management plan;

(2) specific to the materials, uses, and contexts of the building;

(3) sufficiently funded;

(4) staffed by trained professionals; and

(5) based on the collaboration of professionals from various disciplines with input from the stakeholders.

VI. Methodology

A literature review and “best practices” in the Netherlands, Belgium, and England have informed the basis for this study. Survey responses from directors, curators, and conservators of 60 museum institutions, largely drawn from the Historic House Museum Professional Interest Committee of the American Association of Museums, have provided insights. The limited amount of time available to refine the thesis topic, to conduct the research and surveys, and to analyze the results, as well as the response time (or lack thereof) as a result of busy schedules, has affected the scope of the project, and of necessity, certain avenues have not been fully explored. For example, the study might have benefited from a comparative analysis of similar simultaneous surveys of American historic house museums as well as an equal number of Dutch, Flemish, and English historic house museums that subscribe to Monuments Watch/Maintain Our Heritage.
VII. Organization of Chapters

This thesis explores the role of a preventive approach to the care of immovable cultural property in the following four chapters:

Chapter 2: Preventive Architectural Conservation: Evolution of Its Application;

Chapter 3: Existing Models of Preventive Architectural Conservation in Contemporary Practice: Monumentenwacht Nederland, Monumentenwacht Vlaanderen, Maintain Our Heritage (UK);

Chapter 4: Analysis of Contemporary Preventive Architectural Conservation Practices in the United States;

Chapter 5: Conclusions and Recommendations.

Chapter 2 will trace the concept of preventive conservation, specifically as it applies to immovable cultural property, from antiquity through to the 19th century and into the present. The history of the application of a preventive approach to movable cultural property will be discussed only in terms of how it influences more recent practices pertaining to immovable cultural property. Through the relay of this history, the wide-spread support for a preventive approach is substantiated, although it will be shown in Chapter 4 that this preventive approach is not necessarily applied in practice in the United States. Individual contributions of past advocates for a preventive approach towards the care of the built environment will be highlighted. Past advocates include: Vitruvius (c. 100 BCE), Theodoric the Great (r. 493-526 CE), Augustus Welby Northmore Pugin (1812-52), John Ruskin (1819-1900), William
Morris (1834-1896), Herman Muthesius (1861-1927), Gustavo Giovannoni (1873-1947), Guglielmo De Angelis d’Ossat (1907-92), G.C. Argan (1909-94), Paul Philippot, Paolo Mora (1921-1998) and Laura Sbordoni-Mora. Too, public policy in Austria, Belgium, France, Germany, and the Netherlands, as well as international charters and institutional contributions will be considered. International advocates of the present to be discussed include: ICCROM, Monuments Watch Netherlands and Flanders, Maintain Our Heritage (UK), and Seminars on PREventive Conservation and Monitoring of Architectural Heritage (SPRECOMAH). GCI, AIC, and NPS comprise present advocates in the United States.

Chapter 3 examines how preventive architectural conservation has been institutionalized in the Netherlands and Flanders with their Monuments Watch inspection service initiatives, inspiring Monuments Watch programs in other European countries like Denmark and Germany, and the UK. The components which are combined to make these inspection services possible will be revealed and will set the stage for what may be missing from programs in the United States.

Chapter 4 examines the role of preventive architectural conservation in the United States as reported by 60 survey respondents constituting executive directors, curators, and conservators from historic house museums across the country. Comparative analysis of the survey responses and the existing European inspection models will be presented in an effort to determine what a preventive architectural conservation program needs in order to be established.
Chapter 5 offers conclusions and recommendations of what components are needed in a preventive architectural conservation approach, and how these components may be secured with existing frameworks such as the Conservation Assessment Program (CAP), the Preserve America Initiative, and the Save America’s Treasures grant program. Further recommendations for additional avenues to be researched are also indicated.

Through this thesis it is hoped that ultimately, not only will the status of preventive architectural conservation in the United States be better understood, but that this better understanding may stimulate the development of public policy and preventive conservation curricula offered by academic institutions and conservation organizations. Greater awareness of preventive architectural conservation strategies and their subsequent application will ensure the endurance of architectural monuments for generations to come.
Chapter 2
Preventive Architectural Conservation: Evolution of Its Application

I. Introduction

In contrast to the epochal, large scale interventions typical of restoration and reconstruction campaigns, “preventive architectural conservation” involves frequent, informed inspections and regular, small scale mediations and interventions. Review of cultural heritage documentation confirms that this preventive approach is not a new philosophy towards immovable cultural property care, specifically historic building care. The literature and policies of 19th and 20th century Austria, Belgium, France, Germany, and the Netherlands, and international organizations are especially rich with references to a preventive approach. Likely inspired by the drafting of international charters such as the 1964 Venice Charter, calling for the protection and long-term care of immovable cultural property, and subsequent National Historic Preservation Act in 1966, which touches on the importance of maintenance within the overall preservation context, American literature regarding a preventive approach towards historic building care appears from the 1970s onwards.

Although European and American conservation/preservation literature and policies do reference a preventive approach towards the care for immovable cultural property, within the last forty years, preventive conservation strategies for moveable cultural property have been more extensively explored. This is perhaps because movable cultural property may more easily be relocated to “controlled” environments, where risk factors may be reduced or eliminated. Although rooted in 1970s collections care manuals and articles in museum and
conservation periodicals,\textsuperscript{18} collections care references to preventive conservation especially abound in the 1990s, in the form of preprints of submissions to international conference proceedings, as well as museum and conservation periodicals.\textsuperscript{19} These writings address the museum environment in terms of (1) the necessary and sufficient factors leading to deterioration such as fluctuations in temperature and relative humidity, and (2) the mitigation of the enabling factors through the establishment of maintenance plans and emergency preparedness plans, all informed by risk assessments. Since 1990, likely a result of the passing of the New Orleans Charter (1990), the relationship of the collections to the historic buildings in which many of them are housed is taken into consideration before any interventions are undertaken,\textsuperscript{20} bridging the division of movable cultural property care from immovable cultural property care. Of additional interest are the published results of a survey


\textsuperscript{19} Key sources are: the 1990s preprints of the ICOM Committee for Conservation Triennial Conference Proceedings; the preprints of the 15\textsuperscript{th} International Institute for Conservation Congress in Ottawa, 1994; Knell, \textit{Care of Collections}, 1994; various ICCROM publications, notably those covering “Teamwork for Preventive Conservation”; \textit{Journal of the American Institute for Conservation (AIC)}; the \textit{Getty Conservation Institute Newsletter}; and various AIC, APT, and NPS publications like the \textit{CRM Bulletin}. Staniforth, \textit{The National Trust Manual of Housekeeping: The Care of Collections in Historic Houses Open to the Public}, 2006 is another important source.

Employment of national and international standards in preventive conservation has been a topic of discussion within the last 10 years. In 1995, AIC had formed a “Collections Care Professionals Task Force” for standardization of preventive conservation training (de Torres 1995); AIC later details its ethics and standards in terms of preventive conservation in \textit{Commentary 20} (1998). In “Standards in Preventive Conservation: Meanings and Applications” (2002), Alcantara discusses the benefits and limitations of standards.

dealing with cultural property management and perceptions of time and the affects of climate on collections,\textsuperscript{21} in part in response to over-specification of artificial environments as an attempt to reduce risk absolutely. It is clear that a preventive approach towards building care, although a concern for centuries, has been of increased concern within the last forty years, as it has influenced and been influenced by government policies and movable cultural property care. Therefore it is of no surprise that preventive care concerns are currently being propelled to the forefront in the form of international and national initiatives like Monuments Watch Netherlands and Flanders, Maintain Our Heritage (UK), and the Conservation Assessment Program (CAP) in the United States.

This chapter shall now more formally trace the development of advocacy for a preventive approach towards the care for the built heritage. First reviewed shall be highlights in the history of advocacy for a preventive approach, spanning from antiquity to the 20\textsuperscript{th} century; 20\textsuperscript{th} century international organizations and charters and their support of a preventive approach will be discussed next; and the current developments in Europe, the UK, and the United States shall be introduced, setting the stage for Chapter 3, which examines best preventive conservation practices in Europe and the UK, and Chapter 4, which addresses contemporary preventive conservation practices in the United States.

\textsuperscript{21} Lindsay 2005/6.
II. Development

From Antiquity to the 20th Century: Preventive Architectural Conservation Philosophy and Policy in Europe and the UK

Based upon the limited amount of literature dating to before the 19th century, a preventive approach to the care for the built environment is presumed to be well established. However, beyond review of Jukka Jokilehto’s History of Architectural Conservation (1999) and its bibliography, thorough review of all literature referring to conservation and preventive care of the built environment has not been conducted. Vitruvius and Theodoric the Great shall have to suffice as examples of pre-19th century attitudes towards building care. Conservation literature and policies from the 19th century onwards are discussed in greater length in this thesis, with the understanding that current philosophies are more directly influenced by their immediate antecedents, rather than by antiquity. Contemporary attitudes toward the preventive care of historic house museum buildings are the focus of this thesis, with history providing the context and perspective.

VITRUVIUS

Although not directly addressing the long-term care of existing buildings beyond acknowledgement of their inevitable deterioration and the incorporation of moisture and fire protection as well as suitable ventilation and heating, Vitruvius (c. 100 BCE) does declare that methods for prevention of deterioration should be woven into architectural design. He advocates in The Ten Books of Architecture that the materials employed (brick, sand, lime, pozzolana, stone, and timber), their time and method of gathering, their orientation within the building, as well as the overall form of construction of the building, should all be
appropriate to the surrounding climate and the function of the building. If materials, construction methods, and context are accounted for in the design and construction phases, Vitruvius concludes that the architecture is sure to prove durable over the decades and centuries, although deterioration of any man-made assemblage is inevitable: “No walls made of rubble and finished with delicate beauty—no such walls can escape ruin as time goes on.”

THEODORIC THE GREAT

Six hundred years later, Theodoric the Great (r.493-526), Prince of the Ostrogoths and King of Italy, emphasizes the importance of the maintenance of existing buildings, placing it on the same tier as new construction. Theodoric is reported by Magnus Aurelius Cassiodorus Senator in the later’s *Variae* to have stated in a letter to the prefect of Rome:

The beauty of the Roman buildings requires a skilful overseer, in order that such a wonderful forest of edifices should be preserved with constant care, and the new ones properly constructed, both internally and externally.

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23 As a result of time limitations on the production of this master’s thesis, no literature emphasizing the importance of monument maintenance was able to be located between the time of Vitruvius in c. 100 B.C.E. and Theodoric the Great in c. 500 C.E.

It is not clear from this quote if overseers of preservation/conservation were in fact employed in Rome around 500 CE, but one may deduce from the phrases “requires a skillful overseer” and “constant care” that employment of overseers was considered necessary, and their trade challenging and respectful.

AUGUSTUS WELBY NORTHMORE PUGIN

Several centuries later, literature of the early 19th century criticized the lack of respect towards monument care. Augustus Welby Northmore Pugin (1812-52), who contributed to the Gothic Revival in England by collaborating with Sir Charles Barry on the Houses of Parliament, decried the neglect of buildings, most famously the neglect of the Ely Cathedral. Only one person was said to look after the Ely Cathedral. Reportedly there was no protection from water infiltration, and cracks were beginning to form at the west tower.

I have been at the [Ely] Cathedral all the morning. How I am delighted! How I am pained! Here is a church, magnificent in every respect, falling into decay through gross neglect. Would you believe it possible? there is no person appointed to attend to the repairs of the building, and the only person who has been employed during the last sixty years is a bricklayer. Not even common precautions are taken to keep the building dry. . .The fine western tower is falling into great decay, and alarming fissures have taken place and are
become menacing to various portions of the western end which receive the pressure of the tower.  

The lack of constant care clearly upsets Pugin during his visit to the Ely Cathedral.

JOHN RUSKIN, WILLIAM MORRIS, & SPAB

England has produced additional building maintenance advocates in the same vein as Pugin, with John Ruskin (1819-1900) and William Morris (1834-1896) and their Society for the Protection of Ancient Buildings (SPAB). Ruskin in particular decries the concept of restoration, citing that any reformulation of a building damages its original (material) nature as the artist intended, as well as its overall beauty (which reflects nature and thereby God, and is enhanced by age value). He states that if maintenance is performed, the need for “restoration,” a word to which he ascribes negative connotations of destruction and false reinstatement, is eliminated. He further declares that the public has a duty to care for buildings, to institute what would eventually come to be known as “conservation.”

The principle of modern times. . .is to neglect buildings first, and restore them afterwards. Take proper care of your monuments, and you will not need to restore them. A few sheets of lead put in time upon the roof, a few dead leaves and sticks swept in time out of a water-

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course, will save both roof and walls from ruin. Watch an old building with an anxious care; guard it as best you may, and at any cost, from every influence of dilapidation. Count its stones as you would jewels on a crown; set watches about it as if at the gates of a besieged city; bind it together with iron where it loosens; stay it with timber where it declines; do not care about the unsightliness of the aid: better a crutch than a lost limb; and do this tenderly, and reverently, and continually, and many a generation will still be born and pass away beneath its shadow.\textsuperscript{26}

Although Ruskin proposes an organization to assist building owners with maintenance, an organization also later charged with surveying the state of buildings throughout the country and overseeing funds to buy neglected buildings, it is William Morris (1834-1896), famous for his involvement in the Arts and Crafts movement, who founds SPAB in 1877.

SPAB is a society whose primary function is to “promote maintenance and conservative treatments”; it included among its first members Ruskin, Thomas Carlyle, Professor James Bryce, Sir John Lubbock, Lord Houghton, Professor Sydney Colvin, Edward Burne-Jones, and Philip Webb.\textsuperscript{27} The SPAB Manifesto states:

It is for all these buildings, therefore, of all times and styles, that we plead, and call upon those who have to deal with them, to put Protection in the place of Restoration, to stave off


decay by daily care, to prop a perilous wall or mend a leaky roof by such means as are obviously meant for support or covering, and show no pretence of other art, and otherwise to resist all tampering with either the fabric or ornament of the building as it stands; if it has become inconvenient for its present use, to raise another building rather than alter or enlarge the old one; in fine to treat our ancient buildings as monuments of a bygone art, created by bygone manners, that modern art cannot meddle with without destroying.

Thus, and thus only, shall we escape the reproach of our learning being turned into a snare to us; thus, and thus only can we protect our ancient buildings, and hand them down instructive and venerable to those that come after us.28

Although against any modifications to the building to accommodate changing programs, SPAB does advocate constant care with the aim of passing on monuments to future generations.

19TH AND 20TH CENTURY POLICIES IN EUROPEAN COUNTRIES
The governments of Austria, France, Germany, the Netherlands, and Belgium, were among the European countries leading the endorsement of building maintenance in the 19th and 20th centuries. In Austria, the duties of the Central Commission for Research and Conservation of Historic Buildings stated in essence that “Restoration should generally be limited to

regular maintenance, repointing, cleaning, and prevention of damage.”

France’s Service des Monuments Historiques c.1905 gave priority to the maintenance of historic monuments over restoration. In the Germanic countries, architect Herman Muthesius (1861-1927) declared in 1902, “Maintenance instead of reconstruction; that is the general aim of conservation”; architect Baurath Paul Tornow-Metz was involved in a Dresden meeting in 1900 in which he voiced his support of stylistic restoration with respect to the original, and also regular inspections and maintenance after restoration. By 1961 in the Netherlands, an official Monument Law had been enacted, requiring the establishment of a maintenance plan before any restoration plan could receive government subsidy; this condition was not enforced however. With historic designation in Belgium, as established by a 1976 decree, the owners of the listed property “must preserve and maintain” it, or face sanctions in the form of fines, compensations, and the requirement to return the property to its “former condition.”

Individuals in 20th century Italy active in building maintenance promotion include Gustavo Giovannoni (1873-1947) and Guglielmo De Angelis d’Ossat (1907-92), who emphasize

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29 Jokilehto 1999, 164.
32 Jokilehto 1999, 196.
33 Amended details of the owners’ obligations are listed in the 1993 decree [source: Professor Dr. Annemarie Draye, Universiteit Hasselt, Belgium, Email 16 April 2008].
maintenance and repair programs; and G.C. Argan (1909-94), who alludes to the importance of maintenance and repair, including these areas as contributing to one of the two methods of restoration: “conservative restoration” involves “consolidation” and “prevention of decay,” whereas with “artistic restoration,” “operations” are involved.34

20th Century International Charters and Their Influence upon Preventive Architectural Conservation Philosophy in the United States

The following section shall examine the development of international charters and their perceived impact on the development of what essentially composes the preventive architectural conservation literature and policies in the United States. America’s Historic Sites Act of 1935 came on the heels of the Athens Charter of 1931; and America’s National Historic Preservation Act of 1966 followed the Venice Charter of 1964. Shortly thereafter, the Association for Preservation Technology was founded in North America, the American Institute for Conservation of Historic and Artistic Works (AIC) was founded in 1972, the Declaration of Amsterdam was signed in 1975, and the United States National Park Service began producing publications and holding workshops that addressed the preventive care of historic buildings.

ATHENS CHARTER, 1931

34 Jokilehto 1999, 224.
The Athens Charter for the Restoration of Historic Monuments, adopted at the first International Congress of Architects and Technicians of Historic Monuments, Athens, 1931, concludes that each country should establish its own preservation guidelines at the national level, although an international organization is to be established for advisory purposes. Another emphasis is upon the protection of historic sites, whether through reburial and/or security measures. It should be noted that, while the conference members determined it “impossible. . .to formulate any general rules” regarding the long-term care of monuments,35 they championed the approach “to avoid attendant dangers by initiating a system of regular and permanent maintenance calculated to ensure the preservation of the buildings.”36

HISTORIC SITES ACT (UNITED STATES), 1935
The Historic Sites Act, based upon the 1931 Athens Charter, specifically calls out preventive care in the form of maintenance in the section on “Cooperative Agreements,” stating that the Secretary of the Interior shall:

contract and make cooperative agreements with States, municipal subdivisions, corporations associations, or individuals, with proper bond where deemed advisable, to protect, preserve, maintain, or operate any historic or archaeologic buildings, site, object, or property used in

connection therewith for public use, regardless as to whether the title thereto is in the United States.  

Although maintenance methods are not detailed in the 1935 Act, it is significant that maintenance, part of a preventive approach, is considered an integral component of historic preservation.

VENICE CHARTER, 1964

The International Charter for the Conservation and Restoration of Monuments and Sites (The Venice Charter, 1964) was adopted by the Second Congress of Architects and Specialists of Historic Buildings in 1964, and adopted in 1965 by the International Council on Museums and Sites (ICOMOS), which the Second Congress had created in 1964. The Venice Charter builds upon the Athens Charter by providing more guidance on what constitutes an appropriate restoration. Discussed are the preservation of the setting, preservation of all time periods of construction except for in exceptional circumstances, incorporation of new components as distinguishable from historical, and maintenance of


38 ICOMOS was established because of the perceived need to devote an international organization to the conservation of architectural heritage that would be separate from the International Council on Museums (ICOM, founded, 1946). Both ICOMOS and ICOM serve an advisory role to the United Nations Educational, Scientific, and Cultural Organization (UNESCO). [source: http://www.international.icomos.org/hist_eng.htm and http://icom.museum/mission.html 1 May 2008.]
documentation. Article 4 clearly emphasizes long-term care: “It is essential to the conservation of monuments that they be maintained on a permanent basis.” 39

NATIONAL HISTORIC PRESERVATION ACT (UNITED STATES), 1966

The NHPA mentions the importance of preventive care in passing, calling for the “maintaining” of historic properties. Section 1 points to the importance of “maintaining” historic properties for the public interest: “The Congress finds and declares that the preservation of this irreplaceable heritage is in the public interest so that its vital legacy of cultural, educational, aesthetic, inspirational, economic, and energy benefits will be maintained and enriched for future generations of Americans” [italics added]. Section 110, 2B states the federal government’s obligation to ensure maintenance of federal-owned historic properties on or eligible for the National Register of Historic Places:

Each federal agency shall establish (unless exempted pursuant to Section 214) of this Act, in consultation with the Secretary [of the Interior], a preservation program for the identification, evaluation, and nomination to the National Register of Historic Places, and protection of historic properties. Such program shall ensure . . . that such properties under the jurisdiction or control of the agency as are listed in or may be eligible for the NR are managed and maintained in a way that considers the preservation of their historic, archaeological, architectural, and cultural values in compliance with section 106 of this Act and gives special consideration to the preservation of such values in the case of properties designated as having National significance [italics added].40


40 National Historic Preservation Act, Section 110, 2B [source: www.achp.gov/NHPA.pdf].
Although “maintenance” is mentioned in the NHPA, the manner in which it should be pursued is not explained. Overall “historic preservation” efforts are instead the focus of the Act.\footnote{From 1969 to 1980, the National Register Program included grants in aid (millions of dollars) to the states for development projects. Maintenance was a major component of these grants, particularly in the mid to late 1970s.” [source: Dr. Thomas H. Taylor, Jr., PhD, FAIC, FAPT, Director, Architectural Collections Management and Conservation, The Colonial Williamsburg Foundation.]

ASSOCIATION FOR PRESERVATION TECHNOLOGY, Founded 1968

In 1968, APT was founded, dedicated to the promotion of technological advancements in preservation, producing in 1969 its first publications (\textit{Newsletter of APT}, two issues; renamed \textit{Bulletin of APT}) and holding its first conference. Jacques Dalibard, APT President 1972-74, cited the need for technological publications at the time of APT’s founding:

\begin{quote}
\ldots There were pockets of expertise, to be sure, but information was rarely shared either within its own disciples or with experts in related fields. For the most part, hard-earned knowledge remained locked away in individual minds, unavailable. Not for selfishness, but for the lack of a vehicle through which information could be shared.\footnote{Diana S. Waite and Laura Shore, “Three Decades of Interdisciplinary Preservation Technology: APT Celebrates Its Thirtieth Anniversary,” \textit{APT Bulletin}, 1998, H19.}
\end{quote}

APT publications and workshops addressed maintenance of historic properties. For example, the theme of the 1982 APT conference at Banff was “Maintenance and Stabilization.” 1986 saw a course in preservation maintenance to be offered by APT.

AMERICAN INSTITUTE FOR CONSERVATION, Founded, 1972

The American Institute for Conservation (AIC, founded 1972) has its roots in the American Group of the International Institute for Conservation (IIC, founded 1950). The
Architecture Specialty Group was founded in 1988 and has an active membership. AIC’s mission is to serve the art and architecture conservation community by furthering the profession through its sponsorship of publications, lectures, workshops, and conferences. “The Code of Ethics and Guidelines for Practice,” with the accompanying “Commentaries” reflect the professional concerns of the members for promoting and practicing stewardship, advocacy, and collaboration, while always seeking to improve the field. Definitions formed by AIC are considered by many to be the professional standards. The AIC definition for preventive conservation / preventive care focuses upon moveable cultural property and its environmental monitoring (Appendices A and B).

DECLARATION OF AMSTERDAM, 1975

The Declaration of Amsterdam formed by the Congress on the European Architectural Heritage, convened in 1975. Emphasis was placed upon town planning as needing to incorporate historic buildings and good contemporary architecture for the present and future generations so that they may enjoy their common heritage. One of the main points mentions maintenance, stating “To help meet the cost of restoration, adaptation, and maintenance of buildings and areas of architectural or historic interest, adequate financial assistance should be made available to local authorities and financial support and fiscal relief

43 http://aic.stanford.edu/sg/asg/about.html
should likewise be made available to private owners."45 Further on, in the last section of the
Declaration, it is stated that “Permanent maintenance of the architectural heritage, will, in
the long run, obviate costly rehabilitation operations.” 46

NATIONAL PARK SERVICE PRESERVATION BRIEFS (UNITED STATES)
As a response to the 1971 U.S. Executive Order No. 11593 “Protection and Enhancement
of the Cultural Environment” signed by President Nixon, calling for the Secretary of the
Interior to make practical aspects of preservation work available to all levels of the
government, in 1975, the National Park Service (NPS) Technical Preservation Services began
issuing “Preservation Briefs” (PB).47 New briefs are issued as needed: for example, PB47
titled “Maintaining the Exteriors of Small and Medium Size Historic Buildings” was issued in
June 2007. Short sections on maintenance are featured in nearly every brief from the fourth
one onwards through the 46th, each of them stressing cyclical (spring and fall) and routine
maintenance (after storms). Briefs address roofing (general: PB4, wooden shingle: PB19,
slate: PB29, clay tile: PB30); exterior applications: (adobe: PB5, glazed architectural terra
stone: PB42); windows (wooden: PB9, steel: PB13, pigmented structural glass: PB12); barns

45 The Declaration of Amsterdam, 1975 [source: http://www.icomos.org/docs/amsterdam.html 30 January
2008].
46 [Ibid].
47 APT Communiqué vol. ix, no. 2, 1977: 90-91. Lee Nelson initiated the PB series; much of the information in
the early PBs was based upon “lessons learned” from the National Register Program of grants in aid (1969-
1980). [source: Dr. Thomas H. Taylor, Jr., PhD, FAIC, FAPT, Director, Architectural Collections
Management and Conservation, The Colonial Williamsburg Foundation.]
(PB20); moisture (PB39); and ceramic floor tile (PB40). PB27 on architectural cast iron stresses the importance of log books: “Records should be kept in the form of a permanent maintenance log which describes routine maintenance tasks and records the date a problem is first noted, when it was corrected, and the treatment method.”48 PB29 on slate roofing addresses log books and professional inspection at least every 5-7 years. But it is the Preservation Brief 39 “Holding the Line: Controlling Unwanted Moisture in Historic Buildings” which emphasizes the weekly involvement of the property steward in assessing the conditions particularly of vulnerable areas:

Ongoing maintenance and vigilance to situations that could potentially cause moisture damage must become a routine part of the everyday life of a building. The owner or staff responsible for the upkeep of the building should inspect the property weekly and note any leaks, mustiness, or blocked drains. Again, observing the building during a rain will test whether ground and gutter drainage are working well.49

The PB47, “Maintaining the Exteriors of Small and Medium Size Historic Buildings,” emphasizes the importance of the employment of cyclical maintenance and all of the factors that must be considered for its implementation (Appendix C). Included within the PB47’s


pages are two charts; notes on cautionary measures, contracting work, and sealants and caulks; and recommendations for how to approach the inspection and maintenance of buildings.

The two charts are: (1) a sample inspection checklist (including materials, condition description, maintenance action required, and date of work completed); and (2) a recommended inspection frequency chart (Appendix C). The first sample chart focuses upon symptoms, and not underlying causes (moisture, temperature and relative humidity fluctuations, inadequate solar exposure, etc.) which would ideally be considered in a preventive approach in order to limit deterioration. The second chart systematizes the timing of inspections, highlighting minimal inspection frequency and season, and notes that the entire building should be surveyed after a storm. Although addressed in each of the five building element sections, what is missing in the note to the chart however, is that it is also extremely informative to observe the building during different types of weather—a rain storm, a warm and muggy day, an ice storm, etc.—to observe how the building elements react and determine what changes should be made to the surrounding landscape (trimming of trees, re-grading, etc.) and/or to the building elements themselves (repair, replacement, design nuances). A preventive conservation approach would advocate keeping a log of observations throughout the year.

The bulk of the PB47 is dedicated to the building elements to be considered during inspections and maintenance: roofs/chimneys, exterior walls, openings, projections, and foundations and perimeter grades. The brief stresses frequent inspections, including during varying weather conditions, because “routine and preventive care of building materials is the
most effective way of slowing the natural process of deterioration.”50 Within the purview of preventive care, PB47 states are: “regular maintenance inspections, monitoring, and seasonal maintenance work.”51 The brief further stresses that “keeping a written record of completed work” is essential.52 The “written record” should consist of text, drawings, and photographs recording: past work, present condition, and future planned cyclical work. Included should be:

(1) Schedules and checklists for inspections;
(2) Forms for recording work, blank base plans and elevations to be filled in during inspections and upon completion of work;
(3) A set of base-line photographs to be augmented over time;
(4) Current lists of contractors for help with complex issues or in the case of emergencies;
(5) Written procedures for the appropriate care of specific materials, including housekeeping, routine care, and preventive measures;
(6) Record-keeping sections for work completed, costs, warranty cards, sample paint colors, and other pertinent material.53

Time, budget, and trained staff and/or volunteers should be allocated accordingly. This is why prioritization is crucial and that typically “institutions generally need to budget annually between 2 and 4 percent of the replacement value of the building to underwrite the expense of full building maintenance.”54 Although the recommendation is made that the building

51 Ibid.
52 Ibid.
53 Ibid, 3.
54 Ibid.
elements be observed during different weather occurrences, the recording of these observations are not addressed. Documentation of observations made during frequent inspections is a cornerstone of a preventive approach.

NATIONAL PARK SERVICE WORKSHOPS (UNITED STATES)
The National Park Service began offering maintenance workshops during the 1970s. In 1976, *APT Communique* advertised a workshop on “Historic Preservation Maintenance,” sponsored by NPS and NTHP in Monterey, California to take place over five days in May 1976. The workshop was to be for all historic buildings stewards—owners, administrators, consultants, etc. and was intended to help with composition of maintenance plans.55

NATIONAL PARK SERVICE’S CRM MAGAZINE (UNITED STATES), 1978-Present
In 1978, NPS began publishing a bulletin titled “Cultural Resource Management” (CRM). It began as a quarterly publication, but soon moved to six issues in 1985, fluctuating in number since, to as many as 14 in 1997. The December 1978 publication features a book review by Hugh C. Miller, AIA, titled “Technical Literature for the Repair and Maintenance of Historic Structures,” signaling the importance of sharing the most respected literature on historic building maintenance. Among the publications Miller recommends are the NPS Preservation Briefs, J. Henry Chambers’ *Cyclical Maintenance for Historic Buildings*, the Army

Department’s *Technical Manual 5-801-2 Historic Preservation and Maintenance Procedures*, and APT articles in the *APT Bulletin* and *Publications Supplements*.

The July 1984 issue contains another article by Hugh Miller, titled “Maintenance Training for Historic Preservation: Is It a Different Ball Game?” In the article he notes that NPS began offering preservation maintenance training courses during the early 1970s, such as the Mather and Albright Training Center courses. Also Miller points out that the North Atlantic Region during the late 1970s began its own training and certification program. Also during the late 1970s, computer systems to track maintenance work began to be used, such as the North Atlantic NPS Region’s Preservation Maintenance Inspection System (PMIS), which is still being used currently in 2008 according to NPS survey respondents (see Chapter 4 of this thesis). The Historic Structures Preservation Guidelines (HSPG) were developed in the Southwest and Rocky Mountain NPS regions. Miller continues the article, advocating initial preservation maintenance training, to be supplemented by workshops. He highlights the necessity of “determining cause and effect as well as degree of seriousness” and later states that “subjects [should] be observed over time under known conditions that will inform us of how buildings really age and what we can do about the accompanying deterioration” (4). What Miller describes is more than maintenance; it is in essence a preventive conservation approach based on frequent, informed observation and its documentation.

**OTHER ICOMOS CHARTERS**

The Guidelines for Education and Training in the Conservation of Monuments, Ensembles, and Sites, ICOMOS 1993, in aiming to establish standards and guidelines in education and training in conservation, mentions the necessity of the properly trained conservator to be
able to “give expert advice on maintenance strategies, management policies, and the policy framework for environmental protection and preservation of monuments and their contents, and sites.” 56 Maintenance advice is thereby highly valued as a critical component to preservation and conservation work.

The 2003 ICOMOS Charter: Principles for the Analysis, Conservation, and Structural Restoration of Architectural Heritage addresses interventions in historic fabric. Under part 3 “Remedial Measures and Controls,” the first and second sections underline the preference of a preventive approach to an interventive approach: “therapy should address root causes, rather than symptoms; the best therapy is preventive maintenance.” 57 Within the discussion of preventive care therefore, the diagnostic process is emphasized.

CONCLUSIONS

International charters clearly have impacted policy and literature on the preventive approach to the care of historic buildings in the United States; this may be determined from chronological development alone. If the United States is going to provide leadership in the preservation/conservation of the cultural heritage however, stated as a federal government aspiration in the 1966 National Historic Preservation Act, the United States must become


more progressive in its philosophy towards preventive care, and this endorsement must be reflected in official policies. The literature, as represented in the NPS Preservation Briefs and other publications, is espousing a preventive approach, but policies do not specifically advocate preventive care.

**Current Developments in Europe, the United States, and the UK**

**MONUMENTS WATCH NETHERLANDS, Founded 1973**

The Netherlands has led contemporary preventive architectural conservation practice since the establishment in 1973 of Monuments Watch, a government-subsidized subscription inspection service for listed historic buildings. Its success is largely a result of the imbedded respect for conservation within the Dutch public and private sectors, and shall be explained more fully in this thesis’ Chapter 3. It is important to note here that several other European countries have followed the example of Monuments Watch Netherlands, encouraged to establish their own similar programs after Monuments Watch’s 25th jubilee year (1998) presentations to the broader European community.

**CONSERVATION ASSESSMENT PROGRAM (UNITED STATES), Founded 1990 (Appendices D-G)**

The Conservation Assessment Program (CAP), proposed 1988-1990 by the National Institute for Conservation (NIC, now Heritage Preservation or HP) and the Getty
Conservation Institute (GCI), is similar, in many respects, to Monuments Watch. Like Monuments Watch, CAP is a subsidized inspection service for historic buildings, but CAP focuses upon the moveable collections within which they are housed. Unlike Monuments Watch, participation in CAP is reserved for non-profit museums and grants are allocated on a first-come, first-serve basis. Another fundamental difference between CAP and Monuments Watch is that CAP is a one-time service, although participants may apply for a reassessment in seven years time. CAP shall be more thoroughly discussed in Chapter 5 of this thesis in terms of its potential to address a preventive approach in a wider range of historic properties.

MAINTAIN OUR HERITAGE (UK), Established, 1999

Maintain Our Heritage, based on Monuments Watch Netherlands, partners with English Heritage, the Heritage Lottery Fund, and the Department of Trade and Industry (DTI) in order to realize its mission to:

promote a new, long-term, sustainable strategy for the care of our historic buildings with pre-eminence given to maintenance rather than sporadic repair. It is noted that a shift to systematic maintenance will require a change in attitude, policy, and practice in government, the construction industry, the heritage sector, and historic building owners. This can only be achieved through the preparation and dissemination of a compelling, research-based case.

58 Initiated at the request of the National Museum Services Board, the Institute for Museum Services (IMS now Institute for Museum and Library Services or IMLS).

59 In 2006, CAP officially assumed the status of a “technical assistance program” with support by the Institute of Museum and Library Services.


Unlike Monuments Watch Netherlands and CAP, Maintain Our Heritage is first and foremost an advocacy organization rather than an inspection service or a granting agency. Maintain Our Heritage has commissioned the publication of a number of reports addressing the perceptions of preventive care, termed “maintenance” in the reports. All of the pertinent documents are readily available online (including: *Putting It Off*, 2004; *Maintaining Value*, 2003; *Historic Building Maintenance—A Pilot Inspection Service*, 2003). The 2004 Report draws out general themes in order to address strategically the findings presented in the six subject areas, or “modules,” which each claim their own lengthy report under the overarching title Maintaining Value. The six subject areas address maintenance of “listed” historic buildings, and include: best practices, owner attitudes, commercial opportunities, available technology, business opportunities, and educational needs. Eight recommendations, elaborated upon with their respective short/medium/long-term strategies/actions, are offered: (1) National policy should support conservation philosophy; (2) General “best practice” maintenance plans should be established and supported at a national and regional level; (3) Owners should receive support from government and other bodies; (4) The costs and values of maintenance over time should be monitored; (5) Owners need assistance in becoming motivated towards maintenance approaches; (6) Maintenance must be facilitated through insurance, health/safety/access, skilled workers, accessible appropriate materials; (7) Products, services, markets must be developed; (8) Monitoring of these recommendations.

One of the conclusions drawn in *Historic Building Maintenance—A Pilot Inspection Service*, is that secure funding sources prove to be vital to further development of the program and its
ultimate success; and funding sources are most likely to be secured through national initiatives and incentives, whether through tax incentives or insurance incentives. At the very least, literature on the importance of maintenance should be made more readily available and promoted to historic building owners. Further discussion of Maintain Our Heritage and the applicability of its publication findings to preventive practices in the United States shall occur in Chapter 3 of this thesis.

SPRECOMAH, Begun 2007

In 2007, “Seminars on PREventive Conservation and Monitoring of Architectural Heritage” (SPRECOMAH) were organized by the Raymond Lemaire International Center for Conservation (RLICC) at Katholieke Universiteit Leuven (Belgium) and the Institute International Fleuve et Patrimoine (France). The establishment of SPRECOMAH has been much influenced by the Netherlands’ Monumentenwacht, formed in 1973. A planning session took place in June 2007 in Leuven, Belgium, with the first official seminars in December 2007 in Leuven. A second set of seminars is scheduled for May 2008 in Val de Loire, France. The aim of these seminars is to bring researchers and interested parties together to discuss best practice methods and approaches and needed research in the field. Most immediately, the purpose of the meetings is to discuss the proposed installation of a

62 Ibid, 16.

Preventive Conservation Chair to UNESCO, whose task will be to promote preventive conservation and monitor PRECOMOS, a preventive conservation support network.

**III. Conclusion**

Advocacy for a preventive approach to building care may be traced to antiquity. In more modern times, specifically since the 19th century, particularly pronounced has been the promotion of vigilance regarding frequent inspections and observation documentation. The United States has looked to Europe and the international community for precedence, modeling many preservation policies and initiatives on conservation policies that are European and/or international in origin. In the United States, NPS, APT, and AIC publications address preventive care for historic buildings, and CAP aims to provide one-time guidance in the planning for preventive approaches in the museum context. American federal policy however has still not officially embraced preventive methods beyond maintenance. Just how are Monuments Watch Netherlands and Flanders able to implement preventive care through annual inspection services and why is Maintain Our Heritage finding it so challenging to establish a Monuments Watch in the UK? Chapter 3 shall discuss these existing and prospective models of preventive care of the architectural heritage, and Chapter 4 shall examine the situation in the United States.
Chapter 3  
Existing Models of Preventive Architectural Conservation in Contemporary Practice: Monumentenwacht Nederland, Monumentenwacht Vlaanderen, Maintain Our Heritage (UK)

I. Introduction

The history of cultural built heritage protection and care reveals that many property stewards and policy makers have recognized that constant care slows inevitable building material deterioration, thereby preserving material and cultural integrity for future generations. Although 19th and 20th century literature and policies in several European countries and the United States, as well as international charters, demonstrate the concern for historic building longevity, they focus upon the persistence of historic, artistic, and other intangible cultural values; the cost-effectiveness of such an approach, considered a given, has been of secondary importance. It is for both these reasons that policies in the Netherlands and the Flanders region of Belgium are especially supportive of conservation of the historic built environment, enabling the establishment of services to address preventive conservation.

The Netherlands has led contemporary preventive architectural conservation practice since the establishment of Monuments Watch in 1973. Several other European countries have followed its example, encouraged to establish their own Monuments Watch programs after the Monuments Watch 25th jubilee year (1998) presentations to the broader European community. In 2000, Monuments Watch hosted an international conference in Amsterdam dedicated to participants’ experiences in setting up a Monuments Watch in their own countries. Twenty-seven people from eleven countries participated. Representatives from Monuments Watch Flanders (established, 1991), The Risk Map of Cultural Heritage Italy
II. Monuments Watch Nederland

Overview

Monuments Watch Nederland was established in 1973 by a few historic building owners who sought collaboration in maintenance advice and then institutionalized the program on a federally-supported level. In support of its motto “Prevention is Better than Cure,”
Monuments Watch Netherlands serves as a voluntary subscription service to owners of designated historic buildings, providing maintenance advice on yearly intervals. The very foundation of the program is collaboration: the government supports Monuments Watch in terms of philosophy and financing; trained building professionals undertake annual inspections, recording their observations and recommendations in reports; and property owners establish maintenance plans based upon the written and oral reports. One year after the initial survey, the inspection team returns to resurvey conditions and further assist the property owners with advice on continued preventive care.

Conservation in The Netherlands—Government Policy Support

Monuments Watch Netherlands’ success stems in part from its ability to secure federal subsidy, made possible because of the Dutch government’s strong tradition and history of support for architectural conservation. In 1874, Victor E. L. de Stuers (b.1843), a high official in the Dutch government, helped establish the governmental Advisory Council on Historic and Artistic Monuments, which aided in monuments inventory and protection.64 By the early 20th century, a “Provisional List of Dutch Monuments of History and Art” was established for monuments at least fifty years old; monuments recorded on this list were eligible for federal financial assistance for restoration. In 1947, the Department for Conservation was set up to oversee the government’s financial support. By 1961, an official

Monument Law was enacted, requiring the establishment of a maintenance plan before any restoration plan could receive government subsidy; this condition was not enforced however. 1984 saw the publishing of the Minister of Culture’s note on the care for monuments, calling for collaboration at national, provincial, and local government levels; private initiative; and the building owner. After the 1988 Dutch Monument and Historic Building Act gave control of ensuring the “economic and functional survival of the [listed] monuments” to municipal and provincial governments, 2006 saw a return to federal government conservation support “because the system [had] led to an ineffective fragmentation of the budget.”

Currently, federal and local agencies collaborate with Monuments Watch’s efforts to safeguard the Netherlands’ cultural heritage. The National Service for Archaeology, Cultural Landscape, and the Built Heritage (RACM) under the Minister of Education, Culture, and Science ensures the survival of monuments. This agency resulted from the merging of two departments: the Netherlands Department for Conservation (RDMZ) and the National Service for Archaeological Heritage (ROB). The Council for Culture plays an advisory role, while the local councils grant permits for alterations, additions, and demolitions. Local government is able to enforce maintenance of listed buildings if the owner receives

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government financial aid in the form of grants, loans, and tax benefits. In order to receive government aid, a 10-year maintenance plan must be submitted with the application for aid.\textsuperscript{67}

The Netherlands’ history and tradition of support for conservation measures enables the government’s philosophical and financial patronage of preventive care. The establishment of a preventive conservation service supported by the government therefore is made possible.

**Conservation in The Netherlands—Public and Private Support through Historic Designation**

The Netherlands’ federal, provincial, and local governments together demonstrate a strong commitment to the protection of monuments, archaeology; and townscapes/ conservation areas. Listings generally fall into one of three theme areas: (1) water; (2) the 17\textsuperscript{th} century Dutch Republic; and (3) the 20\textsuperscript{th} Century Modern Movement. Newer themes are currently being considered, such as monuments built 1850-1940, and 1940-1965.\textsuperscript{68}

Monuments may be publicly or privately owned. The Netherlands’ 50,000 listed monuments (as of 2005) include private residences, farms, churches and other religious buildings, wind mills, public buildings, fortifications, castles, and mansions. All monuments’ listings are made possible under the Dutch Monument and Historic Building Act (1988). Further,


\textsuperscript{68} ICOMOS Netherlands, 2005.
36,000 monuments (as of 2005) are under municipal protection—over 60% of the Netherlands’ 500 cities (as of 2005) have their own lists and acts, many sustaining part-time employees in administrative positions; 1,000 (as of 2005) are under provincial protection as a result of the establishment of provincial lists and acts in five of twelve provinces.\textsuperscript{69}

There are 500 “protected townscapes or conservation areas” and 15,000 archaeological sites/monuments (as of 2005). The local government designs “use plans” which must be approved by a local council. Ultimately the conservation areas are the responsibility of the Minister of Education, Culture, and Sciences, as well as the Minister of Housing, Physical Planning, and Environment.\textsuperscript{70}

**Conservation in The Netherlands—Public and Private Financial Support**

According to ICOMOS Netherlands, “restoration is the most expensive way of conservation. Regular maintenance is much more efficient. For this reason the policy is now focusing on maintenance and an appropriate system of grants for active and professional management of monuments.”\textsuperscript{71} Funds for conservation and maintenance originate from the public and private sectors. Three areas of funding for conservation and maintenance are: (1) the National Restoration Fund (NRF); (2) the Prince Bernhard Cultural

\textsuperscript{69} Ibid.

\textsuperscript{70} Ibid.

\textsuperscript{71} Ibid.
Fund (Revolving); and (3) special state grants when projects are too large and/or expensive. NRF, founded in 1985, is a private organization supported by the state and by banks. NRF provides tax-deductible affordable loan mortgage interest, which is paid to a Revolving Fund (at 258 million Euros in 2004). Non-government organizations (NGOs)\textsuperscript{72}—which all belong to the National Contact Monuments (Amsterdam), an umbrella organization that serves as an intermediary between NGOs and the federal government—often receive grants to cover 25\% to 65\% of restoration costs if a maintenance plan is created. The Prince Bernhard Cultural Fund provides provincial funding, and is teamed with NRF. Special state grants are often awarded when projects are too large and expensive. In 2000, there was a budget of 90 million Euros; the projected budget 2002-2010 is 231 million Euros.\textsuperscript{73}

**The Role of Monuments Watch Netherlands**

The federally and provincially-subsidized Monuments Watch Netherlands, a non-governmental and independent organization, aids in maintenance and monitoring of listed buildings at any point during their life cycle. As of 2000, Monuments Watch consisted of 52 teams (two people and a properly-outfitted van) which were able to survey approximately 15,000 member monuments annually; it was estimated in 2002 that 20\% of all listed

\textsuperscript{72} NGOs, numbering over 700 in 2005, are usually local or national historical societies (a few of which have been around since the late 19th century) committed to advancing advocacy and management [source: Ibid].

\textsuperscript{73} Ibid.
buildings in the Netherlands utilized Monuments Watch’s services.\textsuperscript{74} As of 2002, the cost of one team over one year (not including vehicle costs because a charitable trust covers them) was approximately 112,000 Euros ($117,454.40),\textsuperscript{75} with approximately 55\% of this covered by provincial government subsidy and the balance covered by the subscribers.\textsuperscript{76} Without the subsidy, the service would cost each subscriber approximately twice as much as the 50 Euro ($52.44) annual subscription fee (actual cost: approximately 111 Euro or $116.41) and 40 Euro ($41.95) per team per hour inspection fee (actual cost: approximately 89 Euro or $93.33).\textsuperscript{77} Assuming that each monument is surveyed each year, which is often not the case, it may therefore be determined that each of the 52 teams surveys approximately 280 of the 15,000 monuments during the course of one year at the cost of 400 Euros ($419.48) per monument, which results in the allotment of approximately 3 hours of time devoted to the survey of each monument.\textsuperscript{78} These calculations are averages only; a pamphlet produced by

\textsuperscript{74} University of the West of England, Bristol, for Maintain Our Heritage, “Research Module 1,” 2003, 24.

\textsuperscript{75} On 28 January 2002, the Euro was worth 0.8578 of a dollar; by 31 December 2002, the Euro had overtaken the dollar and was worth 1.0487 of a dollar. The calculation from Euros to dollars (year 2002) in this thesis uses the later exchange rate.

\textsuperscript{76} University of the West of England, Bristol, for Maintain Our Heritage, “Research Module 1,” 2003, 24.

\textsuperscript{77} Ibid.

\textsuperscript{78} Monumentenwacht Nederland, \textit{First International Conference Monumentenwacht, 15-16 September 2000, Amsterdam} (Amsterdam: Stichting Nationaal Contact Monumenten, December 2002), 11. The average annual inspection time of 3 hours per team per monument is calculated by subtracting the actual cost per monument of the
Monuments Watch indicates that “a small house takes a couple of hours but it takes about a week to inspect a large cathedral.”

Monuments Watch’s services include yearly survey/assessment, minor repairs, and an advisory report to owners including steps to set up a maintenance plan, and a verbal briefing of the written report. The surveys address the exterior envelope, focusing upon areas where different materials interact and at corners/intersections. The assessments are recorded in checklist form with conditions ratings and space devoted to comments (Appendix H).

Photos of conditions of concern and a roof plan supplement the text. Contractors welcome the increase in work as a result of the recommendation of repairs, although Monuments Watch does not suggest specific contractors, nor does it compose specifications.

Monuments Watch maintains that to be a surveyor, “no special education exists for this kind of work”; the requirements to assume the title of inspector are merely “lower or intermediate technical education” and “experience in building especially in restoration projects.”

Experience in construction and/or a remedial technical education are the only prerequisites because continuing education is required through Monuments Watch.

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annual subscription fee (111 Euro) from the average annual cost incurred per team per monument (400 Euro), and dividing the resulting number (289 Euro) by the actual cost per team per hour per monument (89 Euro).

79 Monumentenwacht Nederland, “Prevention is Better Than Cure,” undated pamphlet.


81 Ibid.
It is generally believed that Monuments Watch has extended the longevity of listed monuments in the Netherlands that subscribe to the program. There are as of yet no formal studies with evidence to substantiate this claim, but Monuments Watch’s efforts have been monitored over the last decade by RACM, and evidence collected thus far pointing to conditions improvements indicates the achievement of the program.82

In conclusion, Monuments Watch is relatively well-equipped to provide a preventive conservation service. The program possesses the philosophical and financial support of the government and the property stewards, and employs trained inspectors who produce written and oral reports for the property stewards’ use as baseline documentation and maintenance guidance. Despite these successes, there are areas that prove challenging to address. The software employed to record the inspections, as is evident through the sample report, is relatively low-tech, and inspections occur only once every year or two, depending upon the resource, and likely by different teams; for these reasons, accuracy, resolution, and repeatability are suspect. Monitoring for program efficacy is not presented in the literature, so this author cannot form conclusions as to program quality assurance.

III. Monumentenwacht Vlaanderen

Overview

Like Monuments Watch Netherlands upon which it was modeled in 1991 by the Flemish Regional government of Belgium, Monuments Watch Flanders is funded by government subsidy to act as an “independent advisory body” to property stewards on monument maintenance.\(^{83}\) Governmental bodies in both the Netherlands and Belgium understand that, not only does preventive care ensure the longevity of the cultural heritage, but also regular maintenance will ultimately reduce the need for a large restoration subsidy, although no cost-analysis proving that preventive care is more financially sound than restoration is featured in the program literature of either country. Because of the government subsidy in both countries, the cost of the service to subscribers does not reflect the actual cost; therefore the affordability of the service is likely one reason for its popularity. As of 2006, 40% of subscribers are private owners, 31% are public owners (local government), and 29% are ecclesiastical owners.\(^{84}\) Just like Monuments Watch Netherlands, the collaborative aspect of the public and private sectors in terms of funding, planning, and implementation is the basis for Monuments Watch Flanders’ popularity.

\(^{83}\) Ibid, 12.

\(^{84}\) Prof. Dr. I.R. Luc Verpoest, and Anouk Stulens, “Monumentenwacht, A Monitoring and Maintenance System for the Cultural (Built) Heritage in the Flemish Region (Belgium),” 2006, 3.
Conservation in Flanders—Government Policy Support

The establishment of Monuments Watch Flanders was possible as a result of the continued national concern for conservation since the creation of the Belgian State in the early 19th century. In 1835, five years after Belgium gained its independence from the United Kingdom of the Netherlands, which itself was established after the dissolution of the French Empire (1794-1815), conservation of immovable cultural property became public policy with the establishment of the Royal Commission for Monuments which advised the Prime Minister on conservation matters. This Commission was charged with recommending to the Prime Minister both public and private monuments of exceptional historical and artistic worth, theoretically protecting them from alteration without the Prime Minister’s consent. Public monies could also be sought for acquiring and preserving a “scheduled” property.85

The Royal Commission was charged in 1912 with overseeing landscapes as well, becoming the “Royal Commission for Monuments and Sites.”86

After the mass destruction of Belgian cultural artifacts during World War II, the need for an inventory of destroyed and surviving historic monuments became urgent, and was recognized by the federation. A series of government policies and organizational modifications since those turbulent war years has led to the current structure of conservation policy and administration. In 1946, the national survey was instituted. Also around this

86 Professor Dr. Annemarie Draye, Universiteit Hasselt, Belgium, Email 16 April 2008.
time, the national government called for town planner appointments in each municipality to address reconstruction. Not until the 1970s, however, after the continued loss of many Belgian monuments, did Belgian urban renewal consider the importance of “monumental districts,” their establishment successfully curtailing the destruction of many more monuments.87 It has been since this time, because of local private initiatives, that the Royal Commission has decentralized: in 1970, the Cultural Councils and the three Communities (Flemish in the north, French in the south, and German in the east) each established their own Royal Commissions that were to advise their respective community ministers; in 1989, the Royal Commissions became aligned with the three regions (Flemish in the north, Walloon in the south, and Brussels-Capital), advising the regional ministers; however the German Community retained its Royal Commission.88

**Conservation in Flanders— Public and Private Support through Historic Designation**

Although Monuments Watch Flanders offers its services to both listed and non-listed monuments, it is worth mentioning a little about the listing process and its relationship with the four Royal Commissions to illustrate the involvement of the public and private sectors. As historic designation essentially moved from a community responsibility to a regional responsibility in 1989 (although the German-speaking Community retained their

88 Professor Dr. Annemarie Draye, Universiteit Hasselt, Belgium, Email 16 April 2008.
Commission\textsuperscript{89}, the ministers of each region authorize listings, taking into account public opinion, although they usually follow the advise of their Commissions. In the Flemish Region, for example, “monuments” constitute “immovable goods, works of man or nature or combined works, presenting a general interest due to an artistic, scientific, historical, folkloric, technical, or other social/cultural value, including their fixtures and fittings.”\textsuperscript{90}

There are five areas of designation in the Flemish Region: (1) monuments and urban and rural sites; (2) landscapes; (3) archeology; (4) nautical heritage; (5) heraldry. With designation, as established by the 1976 decree, the owners of the listed property “must preserve and maintain” it, or face sanctions in the form of fines, compensations, and the requirement to return the property to its “former condition.”\textsuperscript{91}

**Conservation in Flanders— Public Financial Support**

“Maintenance premiums” of up to 12,000 Euros annually are available to owners of listed properties, and may be combined with tax advantages “so that restoration work can be

\textsuperscript{89} German-speaking community has established the "Denkmalpflege" (literally "Care of Monuments") for the “listing, protection and maintenance of monuments, historic sites and buildings, as well as protection of typical regional landscapes.” http://www.dglive.be/en/desktopdefault.aspx/tabid-1265/2245_read-28079/ 19 March 2008.

\textsuperscript{90} Ibid, art.2,\textdegree{} decree 1976. Professor Dr. Annemarie Draye, Universiteit Hasselt, Belgium, Email 16 April 2008.

\textsuperscript{91} Amended details of the owners’ obligations are listed in the 1993 decree [source: Professor Dr. Annemarie Draye, Universiteit Hasselt, Belgium, Email 16 April 2008].
avoided.” Tax deductions to annual income taxes are only available if the owner does not rent out the property and opens the property to the public a few times a year.\textsuperscript{92}

The support of Monuments Watch Flanders, which is the umbrella organization for the non-profit, provincial Monuments Watch in Antwerp, Brabant, Limburg, East and West Flanders, comes from a few different public organizations. The King Baudouin Foundation (KBF), the Foundation for the Conservation of Monuments and Landscapes (FCML), and the Flemish Association of Provinces (FAP) all aided in the establishment of Monuments Watch Flanders in 1991. KBF provides “financial and logistical support”; additionally in the early years of Monuments Watch Flanders, the National Lottery provided support as well. The FCML offers “logistical assistance,” while additional funds are provided by FAP.\textsuperscript{93}

**The Role of Monuments Watch Flanders**

There are a few key differences between Monuments Watch Flanders and its model organization Monuments Watch Netherlands. Monuments Watch Flanders was organized publicly on a provincial level, while Monuments Watch Netherlands was organized by a few interested historic building owners who desired collaboration in maintenance advice, and then institutionalized the program on a federally-supported level. [Even with the government subsidies, both programs are classified as non-governmental organizations.]

\textsuperscript{92} Professor Dr. Annemarie Draye, Universiteit Hasselt, Belgium, Email 16 April 2008.

\textsuperscript{93} Monumentenwacht Nederland 2002, 12-13, 16.
Reflecting its regional and/or community government level of conservation oversight, Monuments Watch is not yet present in all Belgian regions/communities. There is a notable lack of the presence of Monuments Watch in the Walloon and Brussels-Capital regions.

Also unlike Monuments Watch Netherlands, Monuments Watch Flanders offers its inspections services to non-listed monuments, and offers interiors and historic boats services as well. Non-listed buildings qualify for the services because, although approximately 10,000 buildings in Flanders have been listed as of 2006, as many as 40,000 are believed eligible.\(^{94}\)

As of 2006, 4,400 owners subscribed to the inspection service, with approximately 300 new stewards joining the subscription list each year; 47% of the buildings are not officially “listed” as historic.\(^ {95}\) The interiors inspection service (est. 1997), for which assessors must have knowledge of art history and art object restoration, and the historic boats service (est. 2008) add depth to the offerings.\(^ {96}\) As of April 1, 2008, nine of the 44 Monuments Watch Flanders teams are interior inspectors, and two are historic boat specialists.\(^ {97}\)

Monuments Watch Flanders may be characterized by the following data, which will enable a relative comparison with Monuments Watch Netherlands. Please note however that data from the year 2000 will have to be used in the analysis because the data from 2002—the year

\(^{94}\) Verpoest and Stulens, 2.
\(^{95}\) Ibid.
\(^{96}\) Monumentenwacht Nederland 2002, 14.
\(^{97}\) Anouk Stulens, Director, Monuments Watch Flanders, Email 2 April 2008.
for which data is available in full for Monuments Watch Netherlands—was not complete. As of 2000, Monuments Watch Flanders boasted 13 exteriors teams and 2 interiors teams for 2400 monuments. Like Monuments Watch Netherlands, two trained inspectors comprise each team, and each team is properly outfitted with a van of supplies equipped to complete a checklist conditions assessment, much like that of Monuments Watch Netherlands, and also a report recommending future maintenance—type, time, and frequency (Appendices I and J). The cost of one team per year in 2000 was calculated to be 104,000 Euros ($108,035.20); of this cost, provincial subsidy covered 70% of costs, the Flemish Region subsidy covered 20%, and subscribers paid 10%; in comparison, subscribers to Monuments Netherlands’ (in 2002) paid nearly five times as much (45% of total costs). Fees for the subscribers to Monuments Watch Flanders as of 2000, at 10% of the actual cost, were 37 Euro ($38.44) per monument per year (actual cost: 370 Euro or $384.36), and 34.7 Euro ($36.05) inspection fee per team per hour spent on the building.

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98 Monumentenwacht Nederland 2002, 19-20. In 2002, there were 20 exterior teams and 3 interior teams inspecting 3200 monuments [source: Ibid, 21], compared to 52 teams and 15,000 monuments in the Netherlands.


(actual cost 347 Euro $360.46),\textsuperscript{101} approximately three or four times as much as fees in the Netherlands in 2002. Assuming each monument was inspected in 2000, which is likely not the case, the result is on average that each of the 13 teams devoted to exteriors inspected approximately 180 of the 2400 monuments in 2000, which is approximately 100 fewer than inspected by each Monuments Watch Netherlands team in 2002. This results in the actual cost, including costs of supporting staff needs and costs covered by subsidies, of 578 Euros ($600.43) per building per year of the 104,000 Euros ($108,035.20) per team per year. This number is suspect however, because the base fee for annual subscription and only 1 hour spent on inspection is 717 Euros ($744.82). Monuments Watch Flanders states that a large church in 2000 cost the subscriber 455 Euro ($472.65), resulting in the actual cost being 4550 Euro ($4,726.54).\textsuperscript{102} It may then be calculated that approximately 12 hours of inspection time would have been devoted to a large church.

In conclusion, Monuments Watch Flanders more heavily subsidizes subscription fees and inspection costs, which were three or four times higher in 2000 than those of Monuments Watch Netherlands in 2002. Perhaps this is because the vehicular costs are factored in to the Monuments Watch Flanders numbers and not the Netherlands numbers, but it is unlikely that the vehicular costs would increase the costs so greatly. Regardless of the discrepancy in fees, it is clear that the 55% Monuments Watch Netherlands subsidy in 2002 and the 90% subsidy

\textsuperscript{101} 2006: 40 Euros per monument per year; 48.64 Euro inspection fee per team per hour spent on building (Verpoest and Stulens, 3).

\textsuperscript{102} Monumentenwacht Nederland 2002, 9.
Monuments Watch Flanders subsidy in 2000 must contribute, along with the relative inspection frequency resulting in deliverables of oral and written conditions assessments and recommendations for maintenance actions, to the appeal of both preventive care programs. However, areas of the program which continue to prove challenging to address include overall frequency of inspections and staffing, use of sufficient software, and monitoring of the program for efficacy.

**IV. Maintain Our Heritage (UK)**

**Overview**

At the time of Monuments Watch Netherlands’ 25th anniversary seminars in 1998, a steering committee composed of representatives from the University of the West of England, SAVE Britain’s Heritage, English Heritage, The National Trust, SPAB, and Bath Preservation Trust, convened to discuss the possibility of forming a Monuments Watch in the UK.103 The organization “Maintain Our Heritage,” a not-for-profit company limited by guarantee (3983254),104 was formed in 1999 in partnership with English Heritage, the Heritage Lottery Fund, and the Department of Trade and Industry (DTI), with the mission to “promote a new, long-term, sustainable strategy for the care of our historic buildings with pre-eminence given to maintenance rather than sporadic repair.”105 Goals are two-fold: (1) advocacy for

104 http://www.maintainourheritage.co.uk/about.htm 19 March 2008.
maintenance because of its environmental and economic benefits; and (2) development of an exterior envelope inspection service,\textsuperscript{106} which was tested by the Bath Area Pilot Inspection Service in 2003. Unlike Monuments Watch Netherlands and Flanders, which benefit from the existing collaboration between public and private sectors, the emphasis of Maintain Our Heritage is on advocacy and education, because the British government has not historically supported maintenance efforts, the property stewards do not understand the economic benefit of maintenance because it is only evident in the long term, and many view maintenance as a “low status professional activity.”\textsuperscript{107}

**Conservation in the UK—Government Policy Support**

Promotion of building maintenance in Britain is considered to be necessary. However, while British heritage professionals accept the 1964 Venice Charter (International Charter for the Conservation and Restoration of Monuments and Sites), the 1999 Burra Charter, the 1998 British Standard 7913, and the emphasis on maintenance in these acts and charters, obstacles to establishing maintenance as a regular, systematic activity abound.

Obstacles believed to hinder the application of regular maintenance routines in Britain include not only economic reasons, as no immediate cost benefits are evident to owners, but philosophical arguments rooted in Britain’s culture and social structure, namely, the

\textsuperscript{106} Monumentenwacht Nederland 2002, 38.

\textsuperscript{107} Ibid, 35.
perception that maintenance is a low-status profession.\textsuperscript{108} Also, while the Dutch government recognizes that maintenance is more cost-effective than restoration and therefore subsidizes owners’ maintenance projects and Monuments Watch projects approximately 50% of cost, the UK government does not subsidize maintenance efforts.\textsuperscript{109} Other funding options, such as the well-established English Heritage grant schemes “can only grant aid structural repairs to Grade I and II buildings and yet its budget is still heavily oversubscribed;” further, English Heritage believes that grant-aiding maintenance would divert funds away from repairs.\textsuperscript{110} What is seen to deter funders from donating money towards a national maintenance plan is largely the hassle of keeping track of the resources, staff, budgeting, and advertising; to remedy this, Maintain Our Heritage has proposed to do all of the promotion and paper work if funders will donate money.\textsuperscript{111} Maintain Our Heritage has acknowledged it will find difficulty with securing funding, locating inspectors, establishing insurance policies, and complying with health and safety measures,\textsuperscript{112} but believes the current approach of neglecting maintenance is not “balanced, economic, or sustainable.”\textsuperscript{113}

\textsuperscript{108} Ibid.

\textsuperscript{109} Ibid, 36.

\textsuperscript{110} Nigel Dann, “When maintenance comes first,” 2000, www.ihbc.org

\textsuperscript{111} Monumentenwacht Nederland 2002, 37.

\textsuperscript{112} Ibid, 38.

\textsuperscript{113} Ibid.
Conservation in the UK—Public Support through Historic Designation\textsuperscript{114}

Public support of monuments protection and restoration projects exists in Britain. Buildings were first “listed” with the passing of the Town and Country Planning Act, 1947; the Planning (Listed Buildings and Conservation Areas) Act 1990 currently supersedes the 1947 Act. Part 1, Chapter 1 of the 1990 Act describes listed structures via the definition of English Heritage, the “government’s statutory adviser on the historic environment”: listed structures are those having “special architectural or historic interest” as determined by the Secretary of State for Culture, Media, and Sport; three grades of listing include Grade I “exceptional interest”, Grade II* “more than special interest”, and Grade II “special interest.”\textsuperscript{115} Listed buildings may be publically or privately owned. As of 2003, 370,000 listed buildings in England, and approximately 92% of these are “Grade II.”\textsuperscript{116} To provide context, there are 10.6 million buildings built before 1944 in the UK.\textsuperscript{117} Estimates are that there are actually over 500,000 separate buildings listed, as listings often group buildings together.\textsuperscript{118} In March 2007, the term “listed building” was proposed to be changed to “designated structure or site,” because of its more inclusive connotations.\textsuperscript{119} The desire is

\textsuperscript{114} http://en.wikipedia.org/wiki/Listed_building 17 April 2008


\textsuperscript{116} Ibid, 2.


\textsuperscript{119} Ibid.
for the term to be applicable to “Scheduled Ancient Monuments,” a more exclusive category of nationally-significant structures that are more closely monitored and protected, requiring “scheduled monument consent” for any work impacting the monument and/or the site; designation as a scheduled ancient monument was made possible by the Ancient Monuments and Archaeological Areas Act 1979. A building may be a Scheduled Ancient Monument and Listed Building only if it is in use, and not solely a museum.

Parliament has given control of monuments care to local government [see Planning Policy Guidance 15: Planning and the Historic Environment (PPG15)] and recommends that at the very least, assistance be provided to building owners. English Heritage’s Managing Local Authority Heritage Assets (2003) recommends that local governments serve as models, as they own many heritage assets. Local authorities can only ensure maintenance by giving “urgent works and repair notices” or even outright purchasing an endangered property; best protection is listing of a building and then adding it to the Buildings At Risk Register so that

121 Ibid.
123 Ibid.
owners must see to repairs, although this enforcement is budget-dependent. The building permits may be denied however if alteration and/or demolition are proposed.

Conservation in the UK—Public and Private Financial Support

Funding sources for restoration projects in the UK comes from four areas: (1) English Heritage grants; (2) Heritage Lottery Fund grants; (3) Church of England projects; and (4) “Ongoing lobby of major property owners and grant givers.” The challenge in UK is that government funding is being cut for heritage care at the same time that growing public interest is contributing to an increase in the number of listed buildings/areas by 1% annually! English Heritage budget cut 23% 1996-2003.

The National Lottery was set up in 1994 to put federal money towards “good causes.” While 50% of the monies goes towards Community and New Opportunities, the rest is equally divided between Arts, Heritage, and Sports, at 16.67% each. “Heritage” may be considered anything from museums, to public parks, to landscapes, to cemeteries, to trains, to churches, to biodiversity, and even intangible heritage. Private owners are not eligible

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because the heritage element must be accessible to the public, and smaller, less well-funded organizations are given priority in grants. The aims of the Heritage Lottery Fund is four-fold: (1) involvement; (2) conservation and enhancement; (3) learning, access, and enjoyment; and (4) equitable distribution of financial resources throughout the UK. Unfortunately, the funding for the Heritage Fund has dropped from 300 million pounds to 100 million pounds, with the lost 200 million pounds being re-routed to the Olympics.\footnote{Kate Clark, Former Deputy Director of Policy and Research, Heritage Lottery Fund. “Ten Things I’ve Learned,” Lecture, University of Pennsylvania, 6 March 2008.}

After three years of research by Maintain Our Heritage into why maintenance is important but why it’s not being implemented, several observations may be made. One of the conclusions drawn was that secure funding sources prove to be vital to further development of the program and its ultimate success; funding sources are most likely to be secured through national initiatives and incentives, whether through tax incentives or insurance incentives. At the very least, literature on the importance of maintenance should be made more readily available and promoted to historic building owners.\footnote{Maintain Our Heritage, \textit{Historic Building Maintenance—A Pilot Inspection Service}, 2003, 16.}

\textbf{Maintain Our Heritage Report Findings}

Maintain Our Heritage commissioned six reports, called “modules,” investigating the feasibility of an inspection and maintenance service for historic buildings in Britain; and a pilot inspection service was undertaken in Bath to supplement the six reports. [The format

\begin{thebibliography}{99}
\footnote{Kate Clark, Former Deputy Director of Policy and Research, Heritage Lottery Fund. “Ten Things I’ve Learned,” Lecture, University of Pennsylvania, 6 March 2008.}
\footnote{Maintain Our Heritage, \textit{Historic Building Maintenance—A Pilot Inspection Service}, 2003, 16.}
\end{thebibliography}
of the pilot inspection sheets—conditions photographs and descriptions, on-site actions, recommendations, and priorities—resembles those of Monuments Watch (Appendix K).

The six modules include:

Module 1: Best Practice Maintenance Management for Listed Buildings (The University of the West of England)

Module 2: Individual Owners’ Approach to the Maintenance of their Listed Buildings (The University of the West of England)

Module 3: The Provision of Commercial Maintenance Services for Listed Buildings (The University of the West of England)

Module 4: Technology—A review of products and services within the field of preventative inspection and maintenance of buildings (Arup Research + Development)

Module 5: Demand and Supply: Building the Business Case for Planned Maintenance (Arup Research + Development)


It may be gleaned from these six modules that a number of preliminary steps are necessary in order to create a receptive environment for a successful Monuments Watch in Britain. These preliminary steps are outlined in a series of eight recommendations in a summary publication produced by Maintain Our Heritage, titled *Putting It Off: How Lack of Maintenance*
Fails Our Heritage (2004). The eight recommendations include: (1) National policy support of conservation philosophy; (2) Establishment and support at a national and regional level of “best practice” maintenance plans; (3) Government (or other body) support of listed building owners; (4) Monitoring of the costs and values of maintenance over time; (5) Encouragement of owners to become motivated to implement maintenance; (6) Facilitation of maintenance through insurance policies, health/safety/access policies, availability of skilled workers, and accessibility of appropriate materials; (7) Development of products, services, and markets; (8) Monitoring of these recommendations.\textsuperscript{130} The findings of each of the six modules have contributed to the list of eight recommendations, which essentially points to the need for public and private sector support of maintenance activities.

\textbf{V. Conclusion}

To inspire and inform American preventive conservation practice, cultural property stewards in the United States would do well to look across the Atlantic to the Netherlands and Flanders and adapt to American cultural contexts aspects of Monuments Watch. Too, the United States may learn from Britain’s struggle to establish its own Monuments Watch, because, as will be shown in Chapter 4, the United States faces similar challenges to those of Britain: mainly, a lack of public and private sector support in terms of philosophy and funding.

Preventive conservation, as put into practice by Monuments Watch Netherlands and Flanders, arguably is able to be pursued because of five elements that are in existence: (1) philosophical support of the public and private sectors; (2) sufficient funding; (3) guidance in implementation with written and oral reports and establishment of baseline documentation; and (4) relative inspection frequency and staffing (once every year or two). Areas which could be improved include the later and (1) accessibility and affordability of supporting software and services; and (2) review of programs for efficacy. Does the United States possess any of these elements which would allow for a preventive approach? Chapter 4 will discuss the results of the survey findings, which will assist in answering this question.
Chapter 4
Analysis of Contemporary Preventive Architectural Conservation Practices in the United States

I. Introduction

Based upon the previous chapter’s discussion of the Monuments Watch and Maintain Our Heritage subscription services, as well as the political contexts in the Netherlands and Flanders enabling the subscription services’ development, one may deduce the components needed for implementation of a preventive architectural conservation approach. The critical component, which is indeed present in the Netherlands and Flanders, is the support (in philosophical and/or financial terms) of all staff members, the public sector, and the private sectors. Without the understanding of the necessity for a proactive approach to ensure the longevity of the built heritage, preventive conservation will not be pursued. Chapter 3 also discusses Maintain Our Heritage, which is the UK’s version of Monuments Watch. Through a series of commissioned studies, Maintain Our Heritage has identified as lacking the philosophical and financial support needed to enable an easier adaptation of Monuments Watch to the UK. Examination of the two applications of the Netherlands’ Monuments Watch in Flanders and in the UK provides a backdrop for comparison and contrast upon which the situation in the United States may be assessed.

As has been stated in previous chapters, the purpose of this thesis is to gain a better understanding of both the existing and ideal impact of a preventive architectural conservation approach upon the management practices of historic house museums in the United States, in an effort to determine if improvements in the approaches should be made.
and how. To obtain a snapshot of current perceptions and practices, an email survey was distributed to approximately 150 individuals representing historic house museums of varying resources. While the targeted audience for the questionnaire was the Historic House Museum Professional Interest Committee of the American Association of Museums (as listed on their on-line directory), to supplement this pool, surveys were also sent to additional individuals believed to be receptive to sharing their thoughts. The survey was designed to take respondents anywhere from thirty minutes to one hour, and to yield both quantitative and qualitative information so as to provide insight into the preventive conservation operations of large and small historic house museums across America, whether publically or privately owned, or located in a rural or urban environment.

This chapter will discuss the key responses of the 60 participants in the survey, which are compared to the key characteristics of a successful preventive conservation program identified in the previous chapter, through study of the Monuments Watch and Maintain Our Heritage programs.

This chapter will present: (1) an overview of the respondents and the respondents’ respective organizations; (2) familiarity of the respondents with the term “preventive conservation”; (4) respondents’ definitions of the term “preventive conservation”; (5) respondents’ reactions to the survey author’s definition of “preventive conservation” and the efficacy of such an approach; and (6) respondents’ existing and ideal incorporation of a preventive approach to management. From analysis of these survey answers, it shall be shown whether historic house museum stewards in the United States are ready and able to implement preventive architectural conservation practices.
II. Survey Results

PART 1: General Information About Respondents’ Organizations

The survey respondents’ institutions represent a wide range of types of organizations hailing from 22 states and the District of Columbia, spanning the country from Massachusetts to California, and Alabama to Wyoming. The organizations are operated either by a non-profit, private foundation, federal government, state government, local government, and/or “other” type of entity, and feature a wide range of historic resources, staff, and available finances. These differing combinations of characteristics contribute to differing sets of challenges regarding site management and the decision to pursue a proactive approach to building care.

1. RESPONDENTS’ LENGTH OF SERVICE (Figure 1)

![Respondents' Length of Service](image_url)

Figure 1
The respondents’ degree of familiarity with their respective organizations was gauged by the respondents’ number of years of employ with their institution. The majority of the survey respondents (56.7% or 34 of 60) have been with their respective organization for over five years, and it may be presumed, know the workings of the organization fairly well. 35% (21 of 60) have been with their organization 1-5 years; only 8.3% (5 of 60) have been with their respective organization for less than one year.

2. RESPONDENTS’ JOB TITLES AND JOB DESCRIPTIONS (Figure 2)

The majority of the respondents, nearly 66% (39 of 60), represent some sort of directorship/managerial position that involves overseeing daily operations, from staff supervision, to fundraising and community relations. A couple of respondents indicate that
each is the only full-time staff person overseeing their respective sites, so both “do it all.”
These types of director positions are represented by the titles: executive director, director, (historic) site manager, and history coordinator/museum manager. Approximately 13% (8 of 60) are curators. 8.3% (5 of 60) supervise buildings, whether they are noted as a supervisor of historic sites, collections manager & curator of buildings, director of buildings, director of preservation, or registrar. 5% (3 of 60) each are conservators or architects (2 of the 3 architects were historical architects). One is a director of interpretation, and another is a volunteer acting as a collections manager and chair of a museum advisory committee. The respondents’ variety of job titles, although clearly skewed toward managerial positions—to be expected as directors were sought because of their assumed familiarity with house museum maintenance operations—ensures a diverse range of feedback.
Nearly 75% of the organizations surveyed are non-profits, and the remaining 25% are largely publically-owned. The 75% (45 of 60) of the organizations that are classified as “non-profit” are either solely non-profits (approximately 50% or 31 of 60), or non-profits associated with another type of entity (approximately 25% or 14 of 60) [private foundation: 6; local government: 2; private foundation and educational: 2; “self-owned”: 1; state government: 1; private foundation and patriotic organization: 1; local government and park district: 1]. Five organizations each (of the 60 or 8.3%) are owned solely by a state or local government. Four of the 60 organizations (6.7%) are owned by the federal government (National Park Service), and one organization (1.6%) is owned solely by a private
foundation.

**Breakdown of Non-Profit Owning/Operating Entities**

[45 Non-profits]

- Non-Profit Only: 65%
- Non-Profit & Private Foundation: 19%
- Non-Profit, Private Foundation, & Educational Institution: 4%
- Non-Profit, Private Foundation, & Patriotic Organization: 2%
- Non-Profit, Private Foundation, & Government: 2%
- Non-Profit, Private Foundation, & Local Government: 4%
- Non-Profit & State Foundation: 2%
- Non-Profit & Park District: 2%
- Non-Profit & Self-owned: 2%

**Figure 4**

4. **NUMBER OF HISTORIC BUILDINGS** (Figure 5)
The number of historic buildings owned by each of the organizations represented in the survey is varied as well. Nearly 50% (28 of 60) of the organizations own and operate between 2 and 5 historic buildings; while at the other end of the spectrum, nearly 25% (14 of 60) of the organizations own and operate more than 20 historic buildings. About 10% each of the organizations own and operate 1, 6-10, or 11-20 historic buildings, respectively. The median number of historic buildings owned therefore falls at the category which indicates the ownership of between 2 and 5 historic buildings.

5 & 6. STAFFING (Figures 6-8)
Number of People on Staff
[60 responses]

- more than 20: 37%
- 6 to 10: 22%
- 2 to 5: 20%
- 11 to 20: 13%
- one: 8%

Figure 6

Number of People on Staff to Implement Preventive Maintenance
[60 responses]

- none or one: 42%
- 2 to 4: 33%
- 5 to 10: 7%
- 2 to 5: 33%
- more than 10: 18%

Figure 7
Regarding staffing in general and staffing to implement “preventive maintenance,” it is revealed that “preventive maintenance” is not a highly-staffed position. It must be noted that the survey question used the phrase “preventive maintenance” because it is assumed that this phrase is unequivocally understood and not in need of a definition like “preventive conservation,” its discussion reserved for later in the survey. However, which activities constitute preventive maintenance and who undertakes them is surely debatable and likely imposes a level of uncertainty to the figures. With these uncertainties in mind, approximately 42% (25 of 60) of the organizations have one staff person or no staff person to implement preventive maintenance; 28% (7 of 25) of those with one or no staff person have no one on staff to implement preventive maintenance (approximately 12% or 7 of 60). Approximately 33% (20 of 60) retain 2-4 staff members to implement preventive maintenance; 25% (15 of 60) have more than 5 staff people to implement preventive maintenance. With relatively few staff members to implement preventive maintenance, it is likely a challenge to succeed with a proactive approach.
In order to gain a better understanding of an organization's priorities, it is worth investigating how the numbers of staff dedicated to preventive maintenance relate to the overall staffing numbers. It appears that 31.67% of all organizations (19 of 60) employ 10-50% of their staff to undertake preventive maintenance measures. Of the organizations that employ 10-50% of their staff to undertake preventive maintenance, approximately 58% (11 of 19) employ 10-36% of their staff to implement preventive maintenance. Therefore it may be determined that with approximately 20% (11 of 60) of all respondents, given 10 staff members, at least one is employed to practice preventive maintenance, and as many as three may be employed. At the same time however, approximately 12% (7 of 60) of all respondents indicate that no staff member is employed for preventive maintenance. Two more respondents may be added to this number, increasing the percentage to 15% (9 of 60)
because each is the sole staff member in his/her organization, and is responsible for preventive maintenance, likely over-burdening the lone staff member. Again, the same conclusion may be drawn as that stemming from the analysis that does not compare numbers employed in preventive maintenance to overall staffing: with relatively small percentages of staff members to implement preventive maintenance, it is likely a challenge to succeed with a proactive approach.

Although an organization’s approximate percentage of employees devoted to preventive maintenance is possible to determine in 28 of the 60 responses, there is a high degree of uncertainty in about half (32 of 60) of the total responses because of the way in which the survey was designed. It was assumed that the majority of the targeted institutions would represent small non-profits, which would not likely have more than 20 people on staff. It was also assumed that no more than half of these staff members would be performing preventive maintenance. As it turns out, 15% (9 of 60) of the respondents indicate that their organizations have more than 20 people on staff and more than 10 people on preventive maintenance, and therefore no calculation as to a percentage of employees participating in preventive maintenance may be determined—the percentage could be as high as 50% or higher, or as low as 10% or even lower. What is clear however is that organizations employing more than 20 people are large, generally in charge of more than 20 buildings in one area (historic district or university campus), or more than 20 sites spread across different states (NTHP, NPS), or even one large building like an art museum; and these organizations will have some amount of staff devoted to preventive maintenance. Only in two instances
does an organization with over 20 buildings have fewer than 10 staff members and only one person devoted to preventive maintenance.

7. STRATEGIC PLAN  (Figure 9)

![Figure 9](image)

While 59% of the survey respondents (35 of 60) report that their organization has a strategic plan, 41% (25 of 60) report that their organization has a strategic plan that is undergoing editing (11), has one in the works (12), or doesn’t have one at all (2). This is an astonishingly large percentage of organizations that do not have an updated long-term strategic plan for organizational priorities, making it difficult to place preventive conservation within the context of the overall priorities of the organization.

8. PREVENTIVE MAINTENANCE PLAN (Figure 10)
Again, for this survey question, the term “preventive maintenance” was chosen instead of “preventive conservation,” as it is believed to be more familiar and less controversial; the term of and approach to “preventive conservation” shall be addressed in later questions.

Analysis of survey data essentially indicates that only about one-third (19 of 60) report the existence of preventive maintenance plans for both their collections and historic buildings, while the other two-thirds (41 of 60) of organizations do not have an updated long-term preventive maintenance plan in place for their historic buildings and/or collections. 28.33% (17 of 60) have a preventive maintenance plan in the works for both collections and buildings, while 20% (12 of 60) do not have one at all. Interestingly, 8.3% (5 of 60) respond that they have a preventive maintenance plan in place for their historic buildings, but not for their collections, and 5% (3 of 60) respond that they have a preventive maintenance plan in the works for their historic buildings but don’t have one for their collections. 5% (3 of 60)
have a preventive maintenance plan for collections only, with a plan in the works for buildings. 1.67% (1 of 60) has a plan for buildings only, with a plan in the works for collections; this respondent indicates that his/her non-profit organization only owns one historic building. The value of a preventive maintenance plan is clearly recognized, as approximately 3 in 10 have one in place for both their historic buildings and collections, and almost 5 in 10 have one in the works for their historic buildings and/or collections. However, 2 in 10 do not have one at all or even in the works for either their historic buildings or collections. Without a plan in place or even in the works, there is certainly not consistent implementation of a proactive approach to building care.

9. PREVENTIVE MAINTENANCE BUDGET

Many respondents indicate that it is extremely difficult, if not impossible, to supply a number and percentage to the cost of preventive maintenance. The reason that supplying a figure proves to be so challenging is because many organizations do not separate preventive maintenance budgets from the total operating costs. Many respondents also indicate that building maintenance budgets vary from year to year because of other pressing needs, and/or because the operating budgets are funding-dependent, whether depending on the public-owning entity, or competitive grants. When numbers and percentages are given, this author believes it is quite possible that many respondents are lumping preventive maintenance in with general maintenance and/or conservation, although large projects like roof replacements are generally indicated as coming from a capital budget. From the 22 percentages supplied, percentages of operating budgets designated for preventive maintenance range from 0.5%-55%, with the majority (17 of 22) falling below 10%. 9 of the
22 fall below 5%. It should be noted that four additional people report budgets of 0% for preventive maintenance, and a few report that money is pulled from the budget as the need arises. Without sufficient and consistent funding, as is the case according to these survey respondents, it is difficult to implement a pro-active approach to building care. Further, it may be argued that respondents need a tool for developing preventive maintenance budgets, as well as a tool for demonstrating that preventive maintenance is more cost effective than episodic work.

10. DEFERRED MAINTENANCE (Figure 10)

![Presence of Deferred Maintenance]

![Figure 11]

83.3% (50 of 60) indicate that their organizations have a backlog of deferred maintenance, a staggering number. 16.7% (10 of 60) report that their organization does not have a backlog.
of deferred maintenance. This could be because the organization has recently undergone a restoration, thus ‘zeroing out’ the deferred maintenance backlog. It could also mean that organizations have different definitions for deferred maintenance. Deferred maintenance might be considered pressing, and therefore acknowledged. If work is considered minor and/or merely cosmetic, the respondent might not consider it deferred. Or, the respondent might not be adequately informed as to his/her organization’s backlog.

ANALYSIS

To ensure a range of opinions, a variety of types of potential property steward survey respondents from across the country have been approached, and 60 of the approximately 150 have provided insights. Respondents’ job titles range from historic house museum directors/managers, to curators, buildings supervisors, conservators, and architects, and each respondent represents a non-profit, public, and/or private institution with many or few historic buildings and staff members.

It may be concluded from analysis of the survey responses that what is able to be stated with certainty is that 42% of organizations either do not have a strategic plan in place, whether at all, in the works, or undergoing editing. This is despite the fact that over half of the calculated percentages of staff devoted to preventive maintenance are not precise as a result of survey design, and percentages of budgets devoted to preventive maintenance are difficult to gauge because respondents indicate that costs are difficult to separate and/or there may be confusion as to what constitutes preventive maintenance and qualifies as a contributing cost. Further, 58% indicate that they either do not have a preventive maintenance plan, or one is in the works for their historic buildings. This roughly translates to two or three in five
organizations not having a long-term plan of care in place for their historic buildings, depending upon whether one considers a strategic plan or a preventive maintenance plan as qualifying as long-term care. It may therefore be deduced that the philosophical support for long-term care and its plan for implementation are not in writing, the presence of which are both critical components needed for pursuit of a preventive conservation approach.

Further, because the long-term care plans are not in writing, stewards are unable to project costs and therefore inform their boards as to what is needed to implement the plan. If costs are known, funds may be reserved for implementation, and comparisons may be made between preventive maintenance and the restoration alternative.

Although around 50% of historic house museum stewards indicate that a written long-term plan is not in place for their organization’s historic building care (strategic plan and preventive maintenance plan), one wonders whether there is a common understanding of what activities are necessary for the long-term care of historic buildings, and if respondents believe that long-term care may be realized through implementation of a preventive conservation approach. Before the answers to these questions may be discussed, the respondents’ familiarity with the term and concept of “preventive conservation” must be determined.

PARTS 2 & 3: Preventive Conservation—Familiarity with the Term (Figures 12 and 13)

The term “preventive conservation” is familiar to a large percentage of survey respondents, with 78.3% (47 of 60) indicate that they are familiar with the terminology “preventive conservation” as it relates to collections and historic buildings. 13.3% (8 of 60) responded
that they are not familiar with the term. 5% (3 of 60) say they have heard of the term as relating only to collections, and 3.3% (2 of 60) say they have heard of the term as relating only to historic buildings.

![Pie chart showing respondents' familiarity with term "Preventive Conservation."](image)

**Figure 12**

Of those familiar with the term, it is clear that the majority learned of the term as part of their professional training and education, although many also first learned of the term on the job or while attending conferences/ workshops like a managerial workshop sponsored by the American Association for State and Local History (AASLH). A few learned of the term by reading publications such as those produced by the Getty, Smithsonian, and National Trust for Historic Preservation.
Most share that they have been familiar with the term for decades. A few respondents relate that they have known the “concept,” which many refer to as “preventive maintenance” or “cyclical maintenance,” and have practiced the concept for a while. One respondent shares that he/she knows of the concept through his/her father, a plant manager and engineer. A few indicate they had only heard the term recently, as a result of a CAP assessment, capital restoration project, disaster preparedness plan, or a conference.

ANALYSIS

The term “preventive conservation” is familiar to the vast majority of survey respondents, and most have known of the term for a relatively long time because of their professional training. Although the majority of respondents recognize the term “preventive conservation,” it shall be explained that the necessity of the term is debated, and definitions of the concept vary. These differences ultimately make a preventive approach to building care difficult to advocate to other staff members, as well as the public and private sectors, who together comprise potential financial supporters of building care efforts.

PART 4: Preventive Conservation—Respondents’ Definitions

The respondents provide varying insights when asked to define what they believe “preventive conservation” should involve, and comment on the appropriateness of the term itself. The responses have been combined and restructured into a “who, what, where, when, why, and how” of preventive conservation, making evident an understanding of the term and approach that is by no means consistent.

THE TERM “PREVENTIVE CONSERVATION”
One of the issues highlighted in responses to this question, as well as later in the survey, is the common perception that the term “preventive conservation” is redundant and unnecessarily confusing. One respondent believes that “preservation” implies preventive conservation and maintenance, and “conservation” implies treatment, so therefore the separate term of “preventive conservation” is not necessary and in itself confusing; the same respondent states that he/she believes “preservation” applies more to buildings and “preventive conservation” to artifacts. Another respondent indicates that “preventive maintenance” has been used by the trades and has meant routine maintenance in a timely way to minimize excessive use, so there is no need for a separate term. Yet another survey participant states that the “term ‘conservation’ is problematic in [the] field of federal work,” because it can be confused with nature/natural resources conservation.

However, a few respondents believe that the term “preventive conservation” is distinct from the term “preventive maintenance” and therefore warrants separation. One respondent indicates that he/she believes “preventive conservation” is a more inclusive term than “maintenance,” although he/she did not elaborate as to how; yet another respondent defines “preventive conservation” as inclusive of “preventive maintenance, cyclical maintenance, environmental monitoring, [and] monitoring the building regularly.” A further respondent states:

It spells out in writing, hopefully before interventive conservation measures are needed, a process that can be used by stewards over a longer period of time. It should not be anecdotal or in someone’s head, but clearly articulated in writing. The costs, both in numerical and aesthetic terms, of not employing conservation practices should be presented.

The key component to this definition is the necessity of the preventive approach to be described in writing for the sake of clarity, which ultimately possesses the potential to
convince all staff members and prospective funders of the benefits of a preventive conservation approach.

It is clear that there is not agreement as to the usefulness of the term “preventive conservation.” It is believed redundant by some and confusing by others; but it is alternatively viewed as precise and comprehensive. Without common terminology and therefore a common understanding of scope, it is unlikely that a proactive approach may even be considered.

WHO SHOULD BE INVOLVED?
Several survey participants emphasize the importance of professional collaboration in the planning and implementation of preventive conservation. Suggested teams consist of maintenance, skilled craftspeople, and consultants; and architects and preservation contractors for larger jobs. One respondent indicates that a preventive conservation plan should begin with a “conditions assessment by architectural conservator and historic structure report to define building history and current conditions. . .” Another relates who he/she believes should take the lead—that preventive conservation efforts should be “supervised by a qualified preservation expert with consultation by other professionals.” Collaboration of various specialists is believed by many to be important for a successful preventive conservation approach.

WHAT SHOULD BE INVOLVED?
Maintenance and conservation treatment activities are identified as constituting “preventive conservation,” along with assessment and research. One respondent believes that
“preventive conservation” sounds “more invasive than maintenance,” as “conservation to
[him/her] means a more active form of stabilization”; another qualifies preventive
conservation as “proactive conservation”; another, a “proactive approach.” Other
comments indicate that preventive conservation, the “opposite of deferred maintenance,”
should involve: “a full range of maintenance activities”; “maintenance, repair, and
stabilization to inhibit the deterioration process”; “maintaining environments,” application
of an “integrated pest management program,” “localized strategies such as water
management, or the use of sacrificial surfaces”; “assessment of building status and integrity”;“proactive use of conservation techniques”; “expert research”; and “insurance coverage.”
From this list of activities, it is clear that respondents identify maintenance, repair, and
conservation treatments with preventive conservation. They therefore assign preventive
conservation an interventive role that is less dependent upon informed observation of
building element performance and probable vulnerabilities, than corrective action that
responds solely to symptoms.

WHERE SHOULD PREVENTIVE CONSERVATION BE APPLIED?
Preventive conservation is viewed as: “highlighting hot spots” like roofs and foundations;
“making sure that all building systems are functioning”; and “being aware of the
environment around the structure.” The value of comprehensive inspections is stressed in
these statements by emphasizing the relationship of the building to its environment--the
awareness of which constitutes a necessary component to a preventive care approach.
However, these observations of consideration of inherent vulnerabilities are exceptional and
not representative of the majority of respondents.
WHEN SHOULD PREVENTIVE CONSERVATION BE APPLIED?
A “regular” and “on-going” schedule of monitoring and maintenance is identified by many to be necessary to implement preventive conservation. Comments include the need for: “dealing with problems before they arise”; “general on-going maintenance”; a “regular plan of action to monitor temp, humidity, and light, correcting deficiencies, and repairing structure regularly”; a “regular schedule. . .[in terms of an] organized and scheduled timetable for identifying components of infrastructure,” [in combination] with monitoring and correction; “plan[ing a] deferred maintenance schedule. . .monitor[ing] repairs, fire detection and suppression”; “routine maintenance checks”; “weekly walk-thrus”; “routine inspection. .annually”; and “cyclical assessment. .and prompt remediation.” Inspection frequency is considered necessary to successful implementation of preventive care, and indeed it is.

WHY SHOULD PREVENTIVE CONSERVATION BE APPLIED?
Many respondents suggest that preventive conservation is necessary to keep the building in prime condition for the sake of the integrity of the historic building, the house museum’s budget, and future generations. A couple of respondents note that, as it may be presumed for all these reasons and particularly for material integrity, preventive conservation shares a parallel with preventive medicine. Says one respondent: “Preventive conservation, like preventive medicine, suggests that you engage in certain activities to prevent, to the best of your ability, illness and/or loss. For buildings that means ongoing maintenance, and utilizing best practices for monitoring and correcting deterioration before it becomes too serious.”

A number of survey participants specifically state that preventive conservation should be implemented to maintain the building fabric as it is currently. Those citing the maintenance
of the fabric write that preventive conservation is about: “maintaining the current conditions”; “maintain[ing] authenticity and integrity”; “protect[ing] the historic building from physical and environmental conditions”; “long-term stabilization to help the building maintain its original features,” and/or “to hold the building in a ‘frozen’ state until better technology can be applied,” ensuring that repairs are “reversible”; “prevent[ing] the building from falling into disrepair,” “taking action to assure things don’t fall apart.” “Maintenance,” is largely believed by many survey respondents to be reactive, less dependent on anticipated vulnerabilities, and viewed as synonymous with “preventive conservation.”

Some survey respondents believe preventive conservation should not merely maintain the resource, but proactively ensure the longevity of the resource. Statements include that preventive conservation should seek to: “preserve as much of the original fabric of items/buildings, and original/appropriate setting of buildings as possible, in a manner which will anticipate and forestall likely deterioration” [italics added]; “prolong the life of historic fabric” [italics added]; and “increase the life span of the building [italics added].” Although consideration during inspections of probable causes for deterioration is not mentioned in these statements, the proactive nature of action is.

The financial cost incurred in the absence of preventive conservation is noted by a few. One states that preventive conservation will: “prevent larger problems in condition down the road which in the end can prove much more costly than regular outlays in small increments to keep those problems from occurring and accruing.” Another states that preventive conservation is needed to “keep” the building “in shape” and “avoid costly problems in the future.” One is specific, stating that “budget planning (capital and operating)” and
“allocation” and “institutional programmatic scope” also needs to be established for preventive conservation. Further, one states that preventive conservation is “responsible and respectful to your visitors. They don’t want to see us waste their resources!”

Three respondents note that preventive conservation ensures that the resource is “available to succeeding generations.” One responds that “visitor impact” and “visitor experience” should be considered when contemplating preventive conservation measures.

A separate consideration as to why preventive conservation should be implemented is identified by three people, who indicate that the historic building is the largest component in their collection, as two people associate the word “artifact” with the historic building, and one person applies a collections care philosophy to the care of the historic building, in terms of: “protection from water damage. . .protection from rot, dry rot, mold, mildew, and infestation. . .insuring that the building envelope is free from gaps, cracks, or missing elements” may be transferred from collections preventive conservation to historic structures. Essentially, as yet another person states, preventive conservation is about “understanding the structure and collections.”

HOW SHOULD PREVENTIVE CONSERVATION BE APPLIED?
Few participants in the survey share just how they believe preventive conservation should be employed. When methods are mentioned, the methods constitute monitoring with appropriate equipment, design nuances, and written documentation, all of which are believed to comprise “best practices.” Most respondents point to the need to establish a plan to “maintain records and devise housekeeping and maintenance plans”; “[to create] timelines
and guidelines”; and to prioritize. One also stresses the necessity of identifying “character defining elements” and specifying which conservation methods are needed and why. Yet another states the necessity of a “conservation treatment. . .based on anticipated future damage.” The Secretary of the Interior’s Standards is believed an appropriate benchmark by one. Another notes that preventive conservation can only be implemented by “ensuring funds.” One says that a form of preventive conservation is to “know when too many visitors is too many visitors.” A phrase offered by one that may well summarize how preventive conservation should be applied is “constant vigilance.”

EFFICACY OF APPROACH
A few respondents warn of uniformly applying a preventive conservation approach to all historic buildings, presumably because of the respondents’ belief that a building’s significance as balanced with the needs of the users should dictate treatment actions. One states: “conservation always involves an action” and “preservation is often the lack of an action. . .preventive conservation is only one of several treatment options that should be used.” Furthermore, this same respondent states that the “primary goal” of a project should not be “risk management,” which he/she equates with preventive conservation. Another respondent notes that “preservation (essentially doing nothing)” should always be considered, and “only applied when there is no other, less invasive choice.” A third person states: “I think [preventive conservation] isn’t a generalized approach because all sites are unique, but the base philosophy is sound. We should always try to achieve better methods and understand our resources so we can treat them properly.” The concern of solely applying a preventive conservation approach regardless of building significance and use is
clearly of concern to a few, although this is probably because of a lack of understanding of what is the foundation of preventive conservation: frequent observation and analysis of potential material and construction vulnerabilities in order to be able to sufficiently respond before a problem becomes too pronounced and a more invasive solution is needed.

A couple of people champion the preventive approach. Writes one respondent: “I would consider preventive conservation a useful approach to historic property management. I would add that a critical aspect is the commitment to maintain preservation interventions (conservation treatment, restorations, repairs, etc.) as this is often costly and sometimes neglected in the proposal stage.” Preventive conservation here is believed to ensure property longevity. Another respondent emphasizes that the property steward must have an understanding of his/her building in order to ensure the building’s durability, and emphasizes observation and critical thinking about potential problems. To this individual, preventive conservation “is a sounder approach as it forces the staff of a site to be more familiar with all aspects and does not lend itself to a don’t worry about it until it is broken attitude.” This is the cornerstone of preventive conservation that few respondents were able to communicate.

CONCLUSION

Property stewards deviate in opinion as to the necessity for the term “preventive conservation.” Some believe “preventive conservation” an unnecessary word and therefore pointless to define, citing it as redundant and confusing, as it is essentially maintenance and repair; others find “preventive conservation” unique and precise, because it assigns responsibility for the anticipation of probable causes and effects. Regardless if preventive
care is referred to as preventive conservation or maintenance, a preventive approach may only be planned for, budgeted for, and implemented if all stakeholders understand that it retains historic fabric and is a cost-effective approach. However, as indicated by the survey responses, if cost-effectiveness was recognized, property stewards would not know how to budget or plan for preventive care. Part 5 of the questionnaire attempts to establish a clear definition of “preventive conservation” so that terminology may be consistent throughout the rest of the survey and responses to a preventive approach as defined by this author may be considered.

PART 5: Preventive Conservation—Reactions to the Given Definition

THE PREVENTIVE CONSERVATION APPROACH

“Preventive conservation,” in terms of historic buildings, is a proactive philosophy aiming to ensure the longevity of the culturally-significant built environment. Measures that mitigate decay, including the realization of cleaning and coating programs and design nuances compatible with the Secretary of the Interior’s Standards for Historic Properties, may be considered as preventive measures. Central to the philosophy of preventive conservation is the establishment of an accessible and comprehensible system for the historic property stewards’ regular monitoring of building conditions and subsequent treatments.131

“Interventive conservation” is a reactive philosophy implemented through periodic, episodic repair and restoration. Strategic conditions monitoring may or may not be addressed in any follow-up work.

All respondents indicate that the approach of preventive conservation as outlined in the provided definition is useful. One respondent writes that preventive conservation is the “logical” approach in terms of cost and material integrity, keeping the visitor in mind;

131 However it should be noted through the author’s subsequent refinement of what she believes preventive conservation to entail—the concept of observation and analysis of probable causes and effects as the critical component—was not included in the definition provided in the survey.
another “the smartest way”; another, “a necessary approach.” Two respondents state that preventive conservation is a “standard of care.”

Three respondents indicate that the Secretary of the Interior’s Standards (SIS) should be a baseline below which the property stewards should not fall, a “zero point for measuring treatment.” The SIS should not be the preferred approach, as they serve more as guidelines for the public, and, one notes, “need updating.” Museum professionals should ascribe to higher standards as noted in several of the international charters.

Although the preventive conservation approach as defined is viewed as an appropriate approach to historic building care, the concern of many is “can it be done,” as staffing and finances are often limited (iterated by 9 of 54 people). One states that “for small organization: useful [approach] yes, practical, no,” this sentiment is seconded by one other person. Even for larger, public organizations, the practicality is questioned. This is why it is paramount that property stewards stress the importance of the approach and communicate this to potential funders so that the tools to ensure the longevity of the cultural resource may be obtained. In order to advocate a preventive approach, property stewards need accessible cost-benefit information that indicates that a preventive conservation program is more cost-effective than deferred maintenance and ultimate restoration, and they need accessible cost planning tools for preventive conservation that are appropriate for their organization.

THE TERM “PREVENTIVE CONSERVATION”

Out of 54 respondents, 24 consider the term “preventive conservation” as defined compelling, 16 consider the term unnecessarily confusing, and 14 believe the term
appropriate for museum and conservation professionals, but not appropriate for the general public. Similar to Section 4 of the survey (when respondents were asked to compose their own definition of “preventive conservation”), the stewards indicate in Section 5 that they are split relatively equally as to the usefulness of the term. Unlike in Section 4 however, some stewards believe the term appropriate only in certain company.

When citing why the term “preventive conservation” is compelling, many perspectives may be noted. Chief among them is the belief that “preventive conservation” sounds like a respected profession, more so than “maintenance.” Others include that “preventive conservation” constitutes “a more technical and trained approach to building maintenance”; “sounds more refined. . .brings to mind a more professional, researched and documented approach to care”; “make[s] some aspects of building maintenance, which are always hard to fund, sound more interesting”; “attaches a professional activity to basic, pragmatic approaches to maintenance”; “suggests a specialized care”; “sounds more current, more professional, and more ‘museum-like’”; “sounds more ‘professional’ in terms of forward planning”; is “more academic and would work better in the board room”; “has more cache than maintenance.” Essentially, “conservation is a word being used by many different fields these days and it sounds more impressive. . .The nuances within them [conservation, preservation, restoration, and maintenance] and how they are used by a staff and board can be very important.” “It [preventive conservation] places a higher linguistic value on the process and keeps the historic nature of the structures being discussed more consistently in everyone’s mind, and serves to highlight the important nature of the necessary preventive work.” It may be surmised from these statements that ultimately, “maintenance” is not a
respected profession because problem solving is not believed a critical component to the
work, as it is in architectural conservation. These survey respondents view maintenance as
constituting reaction and response to symptoms, instead of the search for underlying
probable causes.

A distinction between what is involved in “preventive maintenance” and what is involved in
“preventive conservation” is noted by many. Here is a sampling of comments:

“Maintenance is different than conservation” in that “optimum conservation can cut the
need for some maintenance”; “Protective conservation means more than maintenance”;
“Protective conservation implies a pro-active rather than reactive approach”; “You are not
just maintaining the status quo, you are conserving the artifact”; “The word conservation is
very powerful in that it conveys that you are actually preserving something historical, rather
than just maintaining it”; “Protective conservation is what we do—save history, not prop it
up till it needs propping up again”; There is a “basic difference between maintenance and
conservation”; “Protective maintenance is a part of protective conservation, but not the
whole of it. To use solely the term protective maintenance could be misleading.”

Furthermore, one respondent notes that “preventive conservation” suggests an iterative
process, as it “emphasizes the feedback loops that are necessary to stay on top of such a
strategy.” Many believe that the professional responsibility and specialty needed in making
decisions regarding care of the cultural heritage is inferred with the term “preventive
conservation,” and therefore a useful term.

Nearly as many people believe the term “preventive conservation” to be redundant,
confusing, and/or an unnecessary distinction from “preventive maintenance.” Comments
include that “preventive maintenance” and/or cyclical maintenance are sufficient for use within the profession, with boards, and with the general public. Other recommendations include the use of other terms like “collections care,” “buildings are,” and “proactive care.”

One respondent states “Maintenance is a term that most people are familiar with, and to some of the hard-nosed board members of the old school, ‘conservation’ smacks of white gloves and precious handling of buildings that are, after all, designed to be used. I would have to say that maintenance is a word with which they have a much higher degree of comfort, so that’s what I use in trying to sell a project.” Others respond that “the average Board of Directors is not going to differentiate about the distinction between the terms”; “They are used to talking about ‘preservation’ and ‘restoration’ in relation to buildings, rather than ‘conservation,’ which I think they might relate more to objects”; “Many would understand Preventive Maintenance, but tend to think Preventive Conservation is a use of ‘lingo’”; “honestly, I’m not sure the subtlety would be noticed”; “the term ‘preventive maintenance’ is more accessible and comprehensible to them because more within their own realm of experience”; “the term ‘conservation’ leads board members to assume that the need is not a need per se. So I use the term ‘maintenance’ when conveying the urgency to my board. . .[and] ‘conservation’ or ‘preservation’ when referring to a specific object or project”;

“Preventive conservation gives the impression that one might be working in opposition to preservation or conservation. I agree with dropping the maintenance word—we tend to use preservation or conservation work or plan”; “the term itself is not important, but rather the substance behind the term” It is inferred by these respondents that maintenance activities are not different from preventive conservation activities, and are appropriate to a resource that is in use like a building.
Nearly as many people who consider the term “preventive conservation” confusing and unnecessary, consider “preventive conservation” appropriate for museum and conservation professionals but “preventive maintenance” is more accessible to boards and the general public. With either phrase, stewards stress the importance of educating boards and the public. One respondent draws the distinction of the use of the term “preventive maintenance” being dependent on the significance of the buildings: “Yes, if you’re dealing with a building that is universally considered truly significant. Otherwise no. The importance of building conservation is subjective to the donor. Building conservation is becoming more expensive for those responsible.”

The historic property stewards that completed the survey diverge in opinion as to the necessity of the term “preventive conservation.” Some consider it useful because of its clarity and professional connotations, others not useful because of its unnecessarily-subtle distinctions from preventive maintenance, and still others only useful for a professional audience only. Despite the divergence, the necessity for a preventive approach to historic building care is noted.

**PART 6: Preventive Conservation—Implementation**

1. PLANNING, BUDGETING, AND IMPLEMENTING PREVENTIVE CONSERVATION

Although respondents’ answers are diverse, several may be considered to be a representative sampling. Therefore, a few particularly interesting comments shall be highlighted in this section, divided into the categories believed by this author to be necessary for a preventive conservation approach: support, funding, written plan for implementation, inspection
frequency and sufficient staffing, and access to and affordability of sufficient software and professional services. Monitoring for efficacy of the implementation plan is not mentioned by any stewards.

Support: The majority of respondents did not indicate philosophical or financial support from the government, public, outside professionals, other museums, or other staff as being a component of their planning, budgeting, or implementation of preventive conservation. Exceptional is the case where one respondent indicates that all staff members receive copies of long-range plans, emphasizing collaboration.

Funding: Most state inconsistent funding from year to year that is largely out of their control, being based upon grants, priority areas, and donors’ wishes. Most seem to be allotted money on an “as-needed basis,” although one comments that he/she has led the increase in budget allotment to preventive conservation over his/her years of employ.

Approach in Writing: Written plans are largely undertaken on monthly, bi-annual, or yearly intervals, depending upon the site and when budgets are to be reviewed. The written plans largely consist of lists of prioritized projects, scheduled repairs recorded on timelines, and work orders as needed. The general feeling is that it is impractical to form a written preventive conservation inspection plan. One respondent states “advanced planning has been attempted, but hit snags.” Another respondent believes that the best approach for his/her organization, which owns well over 100 buildings, is a combination of “Closing cycles” and “Planned preservation projects,” both rooted in the type of routine examination that is considered appropriate to the significance of the particular historic building. A couple
of respondents indicate that the CAP report provides guidance, and most point to the value of observations made throughout the year to inform all written proposals.

Inspection frequency and sufficient staffing: Inspection particulars are not generally revealed beyond the fact that they vary in frequency, from, for example, weekly, twice-monthly, throughout the year, yearly, etc. Many organizations indicate the collaborative nature of the inspection process, although one indicates, and is probably not alone, in stating that his/her organization does not have regular maintenance personnel.

Access to and affordability of sufficient supporting software and techniques: Access database, notes recorded in field on a laptop, building maintenance software.

As revealed by these representative responses, preventive conservation efforts do not possess philosophical or consistent financial backing, depend largely upon checklists and work orders because of complexity of forming a plan appropriate to each historic building’s context and use, vary in frequency, and depend upon databases and not drawings and graphs to determine probable causes and effects.

2. OVERSEEING PREVENTIVE CONSERVATION

Analysis of those overseeing preventive conservation and implementing it reveals that generally all of the organizations use a team approach, usually involving a Facilities Manager, Director of Conservation/ Preservation, Curator, and an Executive Director and Board to oversee and sign off on all budget allotments. Different committees are also sometimes involved.
3. USE OF PROFESSIONAL ASSISTANCE

Most of the organizations also state that they use a variety of outside professional help. 10% of respondents (5 of 50) have revealed that they do not contract with outside professionals. Two of the publically-owned organizations indicate that acquiring skilled craftsman trained in historic construction techniques is often not possible as they must go with the lowest bidder. Two respondents also indicate that it is difficult to find qualified contractors, so the quality of the work often suffers; if qualified contractors are found, they are usually hard to employ because they are so busy.

4. USE OF REGULAR SURVEYS (Figure 13)

Over half (54% or 28 of 50) relate that their organizations conduct “regular” surveys, and about one quarter (26% or 12 of 50) relate that their organizations do not. Interestingly,
20% (10 of 50) have plans to implement regular surveys, indicating that the need to conduct them has been acknowledged.

5. IDENTIFICATION AND TIMING OF ELEMENTS SURVEYED

Most of the survey participants indicate that all exterior building elements are surveyed. The timing of surveys varies from being listed as irregular, to daily, weekly, bi-monthly, monthly, quarterly, bi-annually, annually, and every 5 years. One participant does not explicitly call out building elements to survey, but states “buildings should be monitored on a weekly basis and work orders issued as needed.” Another participant takes the exact opposite approach: “We monitor everything. Being here a short time I am still working on initial stabilization which will dictate the treatment cycle.”

6. METHODS OF RECORDING CHANGES IN CONDITION

The majority of respondents indicate that changes in condition are monitored through digital photographs, written notes and reports, and memory. One states that “[although] forms [are] no longer used (proved too redundant)—notes [are] made and work orders issued.” The other extreme is related by another respondent: “digital images are taken once a month, dataloggers take temperature, light, and RH readings every fifteen minutes. We are putting the house into CAD and GIS, as well as creating detailed conditions assessments.” This brings into question how the vast amounts of data that are collected are being stored. Measurements as a whole are only directly mentioned by 18% of respondents (9 of 50). Dataloggers of some sort are mentioned by each of these nine, and crack monitors are mentioned once.
7. ENSURING THE LONGEVITY OF RESTORATION

The respondents’ answers are diverse, but are similar to question #1 which inquires into current practices, yet, several may be considered to be a representative sampling. Again, frequency of inspection is valued, although the manner in which the inspection is conducted is not directly explained by most, and practicality of implementation is questioned. One steward reports that, in reality, his/her organization will undertake a restoration and then “forget about it” because the money to ensure the longevity for the restoration is not there. Ideally, this steward continues, setting up an endowment would be the way to ensure continued care.

Regardless of feasibility, many stewards report that there would be an attempt to “try to get the site to prepare a cyclical maintenance program and schedule as part of the project and ensure that the site has the appropriate staff or consultants”; a couple cite that they would try to retain “the professional who did the work” essentially through “a follow up contract with a historic architect” in order to do yearly walkthroughs with the Director of the Physical Plant. Some stress collaboration of all staff members in scheduled walk-throughs to generate lists of priority work, and the need to hire more staff to continually monitor conditions.

A couple of respondents take a more systematic, comprehensive approach to planning and implementing frequent inspections in order to ensure that the restorations endure. One explains the process of the creation of baseline documentation, maintenance plans, and recommended treatments to advise those carrying out the work. The other steward places priority on determining probable causes of current and future deterioration to control the
progression of deterioration. These two stewards are the few that communicate these proactive concerns in a direct manner, even though most all stewards appear to value the frequent inspection process, albeit qualified as more reactive.

8. IMPROVEMENTS NEEDED FOR THE SUCCESSFUL IMPLEMENTATION OF PREVENTIVE ARCHITECTURAL CONSERVATION

Respondents identify a number of deficiencies in the ability to implement a proactive conservation approach. Among the leading concerns is the need for access to more money, trained staff, understanding between staff members of different departments, better software tools to record and track changes, and access to skilled craftspeople. Also mentioned are the needs for a better written conservation plan, community support, government support and better access to government documents, architectural conservators on staff, access to better technology and techniques for treatments, advice and support from other-like institutions, a course on preventive conservation easily accessible, and a general model to follow. Chapter 5 shall discuss possible courses of action to address these challenges.

III. Conclusion

Review of the survey results indicates that the majority of American historic house museum stewards, whether executive directors, curators, or conservators of large or small, and public, private, or non-profit institutions, believe that the preventive conservation philosophy is the preferred approach to historic building care. However, as has been determined through analysis of respondents’ definitions of preventive conservation and their organization’s approach to long-term building care, few differentiate between a preventive approach and regular maintenance schedules which this author believes are essentially more reactive to
symptoms and do not address the potential underlying future problems. Many indicate that public and private sector support is simply not present, which this author believes is a result of a lack of convincing argument for a preventive approach, not surprising, as property stewards are not in agreement as to what this entails and its importance to ensuring endurance of cultural property. Does the United States have any programs in place that may be modified to advocate preventive conservation, and what other actions need to be taken to promote the proactive approach? Chapter 5 seeks to answer these questions.
Chapter 5
Conclusions and Recommendations

I. Conclusions of Survey Findings

The assortment of stewards surveyed believes as a whole that, despite the challenges of its implementation, preventive conservation in concept (as presented by the author) is a necessary and cost-effective approach to the continued care for historic buildings interpreted as historic house museums. Although the stewards diverge on whether or not there is a clear distinction between preventive/cyclical maintenance and preventive conservation, the latter emphasizing awareness of material and construction vulnerabilities during frequent documented inspections, they acknowledge that a proactive approach in general terms is preferable to a reactive one. A few indicate that the unique contexts and uses of each building should always inform its program of care. The acknowledgement of the necessity for a preventive care approach results from the stewards’ seemingly intuitive beliefs (as no hard evidence supporting these assertions was supplied) that preventive care is more cost-effective than restoration, is more respectful of a building’s past because it is usually less invasive than restoration, and is more deferential to future generations for the same reason.

The property stewards’ acknowledgement of the necessity for a preventive approach is arguably in conflict with American societal values, which champion the new over the old; the result is a difficulty in securing substantial financial support for the implementation of preventive care. The United States harbors a “culture of replacement,” aligning with what is beneficial for the present situation and not what has been in the past and may be in the future (which is of course unknown). It is a culture that rarely looks backwards or too far
into the future. The triumph of the individual and his/her rights, particularly property rights, also assumes priority over collective concerns unless deemed as offensive or limiting the freedoms of others. As a result, the modern historic preservation movement in the United States is rooted in saving buildings from the wrecking ball, an inherently reactive approach that even today, will rally more people at the construction barricades, than a discussion of preventive maintenance for building stewardship.

In Europe however, the antique has been historically valued over the new, and there is a legacy of a burden of care, as property is passed from generation to generation, placing emphasis on collective ancestry. Although facing their own challenges, given these cultural contexts, European property stewards are generally receptive to a preventive approach, as has been shown through the popularity of Monuments Watch. In contrast, American property stewards indicate in their survey responses that a preventive conservation or maintenance philosophy is not generally implemented in the United States because the property stewards do not have the philosophical support of the public or private sectors, which together would enable sufficient budgeting, staffing, and training tools to ensure excellence and consistency in approach. A further challenge is that because natural, inevitable deterioration proceeds at such a slow rate, change in condition is not as evident or alarming as damage resulting from sudden, large scale disaster. Therefore, if one is uninformed as to the cost and/or consequences of not pursuing a preventive approach, proactive care is dismissible because it does not address a critical need.

Tools for budgeting, staffing, and training might well be provided by philosophical and financial support of both the public sector (NPS; federal grant programs) and private sector
(architecture, engineering, and conservation firms; foundation grants). The present policy and grants system in the United States, similar to that of the UK, in effect encourages the neglect of buildings through the funding of restoration efforts as opposed to preventive or proactive or maintenance efforts. Also, as has been shown in Chapter 3, the public and private sectors in the Netherlands and Flanders, understand the value of continued proactive care, and assist stewards with implementation.

Based on the survey results, it is clear that, if preventive care of buildings is to be implemented in the United States, a broad policy initiative is needed to provide guidance and monetary support to assist with preventive care budget planning, staffing, and training, and must be more accessible and more affordable. This chapter will investigate but three possible avenues of assistance—federal leadership through the Preserve America initiative, public-private partnership through the Save America’s Treasures program, and the federally-funded Conservation Assessment Program for collections—in an attempt to offer examples of how to facilitate the challenge of implementing a proactive approach to historic building care.

II. Opportunities and Limitations of Some Existing Preventive Conservation/Maintenance Supporting Services in the United States

Preserve America (Federal Initiative)

A possible avenue of assistance in the sense of advocating preventive conservation and providing federal leadership is the Preserve America initiative. Preserve America is an Executive Order that was signed by President George W. Bush on March 3, 2003 to encourage the various agencies of the federal government to actively further the National
Historic Preservation Act of 1966 by serving as leaders in the preservation field, and collaborating with other federal agencies and levels of government. To ensure that each federal agency would participate, reports on each agency’s “progress in identifying, protecting, and using historic properties in its ownership” were first due to the Advisory Council on Historic Preservation (ACHP) and Secretary of the Interior (Secretary) on September 30, 2004, with updated reports to be submitted every three years thereafter. The ACHP and Secretary would have a year to review each report and compose a comprehensive report including the progress of each agency.132

In the spirit of the Executive Order, the ACHP, Secretary, and White House organized a Preserve America Summit that was held in New Orleans during October 2006. Findings and recommendations of this summit were published in August 2007 in a report produced by the ACHP. The ACHP narrowed the 70 recommendations of the summit participants down to 13 that it believed would be realistically accomplished by the federal government in the short term.

While not one of these 13 specifically identifies the promotion of preventive conservation/maintenance plans, several of the 13 are loosely related. General management was referenced in the Executive Order’s Section 4a “Improving Federal Stewardship of Historic Properties.” Too, the “Provide Leadership” section emphasized the need for the federal

government to take the lead in more actively engaging in the international preservation/conservation scene; highlighted was discussion of the establishment of a “centralized clearinghouse for sharing international preservation experience between the public and private sectors and for providing information on international preservation practices” (pp17-18). This acknowledgement would surely increase America’s receptivity to learning of popular preventive conservation programs in Europe like Monuments Watch and how these programs may be adapted to America. Also recognized, under the category of “Enhanced Stewardship,” was the need of the National Center for Preservation Technology and Training’s to more widely distribute information (14), which could address the concern of many property stewards that they don’t have the software tools to monitor their properties.

The Preserve America initiative possesses the potential to encourage the federal government to serve as a model in preventive conservation implementation to private and non-profit sector stewards, essentially furthering collaboration between all sectors and even the international community.

Save America’s Treasures (Public-Private Partnership)

The Save America’s Treasures grants program is a possible avenue of assistance in terms of funding preventive conservation. Established by an Executive Order in 1998 under President William Jefferson Clinton, with support of the White House Millennium Council and the National Trust for Historic Preservation, “Save America’s Treasures” is a public-private partnership between the non-profit National Trust for Historic Preservation, and the
federal government in the form of the National Park Service, National Endowment for the Arts, Heritage Preservation, and the National Park Foundation. In addition to the annual awarding of 1:1 matching preservation and/or conservation grants to nationally-significant elements of cultural property, including the moveable and non-moveable, the program also advocates preservation through educational programs and campaigns to raise concern and support for preservation. According to Save America’s Treasures’ website, “over $350 million in public-private funds” (from the program’s inception to January 2008) has been instrumental in the success of the program. The potential of Save America’s Treasures to promote and ensure that restorations funded by its grants include preventive conservation and maintenance plans is promising.

Conservation Assessment Program (Heritage Preservation)

The Conservation Assessment Program (CAP) was proposed 1988-1990 by the National Institute for Conservation (NIC, now Heritage Preservation or HP) and the Getty Conservation Institute (GCI) at the request of the National Museum Services Board, the Institute for Museum Services (IMS now Institute for Museum and Library Services or IMLS). CAP has many similarities with Monuments Watch, and therefore the potential to

133 www.saveamericastreasures.org 27 February 2008. Currently, “the minimum grant request for collections projects is $25,000 federal share; the minimum grant request for historic property projects is $125,000 federal share. The maximum grant request for all projects is $700,000 in federal share.”
finance and guide preventive conservation. Like Monuments Watch, the site-specific observation and advice are the basis for CAP, although the emphasis of CAP begins with collections, and historic structures follow. The CAP report “identifies and described the problems that affect the preservation of collections and historic structures, analyzes the causes of these problems, and suggests a plan of action.” Unlike Monuments Watch however, the two assessors are chosen by the museum itself and approved by CAP. They perform the conservation assessment over two days and write the report generally over three days, submitting the final report usually within eight weeks from the time of the inspection.

There are other fundamental differences as well. Although like Monuments Watch, CAP is a subsidized program guiding the conservation planning efforts of institutions managing cultural resources, participation in CAP is reserved for non-profit museums and is awarded on a “first-come first-serve” basis. Another fundamental difference between CAP and Monuments Watch is that it is a one-time grant award, although participants may apply for a reassessment (ReCAP) in seven years. Monitoring of changes over time is not the aim of CAP, because it is expected that the steward organization take full responsibility for continual monitoring; what is the aim of the program is producing a snapshot of conditions at a certain point in time and predictions of subsequent damage based upon background

134 In 2006, CAP officially assumed the status of a “technical assistance program” with support by the Institute of Museum and Library Services.

information provided through consultation with the steward entity and this one-time site consultation.\(^{136}\)

In 1999, the Getty Conservation Institute, which had been instrumental in establishing the methodology of the CAP program, published a proposed updated variant of CAP’s The Conservation Assessment (CA): A Tool for Planning, Implementing, and Fundraising (1990), titling it The Conservation Assessment (CA): A Proposed Model for Evaluating Museum Environmental Management Needs. In this publication, the authors explain the approach of the CA, which is based upon the study of “the physical and organizational aspects of a museum.”\(^{137}\) The CA assessors aim to assist each museum with identifying and prioritizing its needs, such as establishment of a maintenance program, needs that are determined with consideration of material and construction vulnerabilities, and the unique position of each museum.\(^{138}\) “What is at the heart of successful assessments is a process by which conditions, causative factors, and risks are analyzed, characterized, and prioritized.”\(^{139}\) Therefore, the assessment is subdivided into three focus areas: (1) The Macro-environment; (2) The Building: Performance Characterization; (3) The Collection Environment.\(^{140}\) The macro-environment includes characterization of the climate: temperature, relative humidity,


\(^{138}\) Ibid, 2-3.

\(^{139}\) Ibid, 4.

\(^{140}\) Ibid, 6.
wind and air movement, solar radiation, air quality, particulates, gaseous pollutants, air-borne insects, vegetation and landscaping, surrounding construction, adjacent buildings, pavements, water sources, historic context.\textsuperscript{141} The study of the building includes the affects of temperature, moisture (roofs, walls, occupancy), ventilation and filtration, natural light, structure, fire resistance and protection, physical security.\textsuperscript{142} The collection environment is determined based upon a study of the various museum policies, including those pertaining to exhibition and storage in particular. Next, collections sensitivities are determined based upon their inherent make-up, and the risk factors present and future identified. Further, different types of disasters are considered in relation to the level of the museum’s preparedness.

In conclusion, a CAP-like program centered on historic buildings that are not necessarily museums, and administered by an existing organization, such as Heritage Preservation or the National Center for Preservation Technology and Training, would have the potential to improve the quality of preventive care through assistance with budgeting, staffing, and training. Follow-up with the property stewards on a two to five year cycle would help ensure continued implementation. In the same way that a CAP-like program for buildings would facilitate stewardship, Save America’s Treasures would do well to ensure that a preventive conservation plan is required with the application of any grants, and advocacy and education

\textsuperscript{141} Ibid, Part II: Conservation Assessment Guidelines, 3-5.

\textsuperscript{142} Ibid, 6-12.
programs should provide support. Further, the federal government in the form of the National Park Service should encourage application of preventive conservation measures by engaging in them itself, complying with the Preserve America federal initiative to fully embrace the preventive approach. However, policy makers and funders will need to be convinced to back preventive care, and they will only be convinced if hard evidence and a solid analysis point to the critical need to implement a preventive approach towards historic building care.

III. Recommendations for Action

Advancement of a philosophy of preventive care stewardship for historic buildings in the United States is believed to be necessary to ensure the longevity of the American built cultural heritage. While there are surely a wide range of possibilities for how to approach advancement, several straight-forward actions are worth considering:

Additional Information Gathering

--Distribution of the survey—and/or a different survey that perhaps hones in on potential solutions—to a larger pool of historic house museums in order to gain more insight.

--Development of a work conference on the possibility of a Monuments Watch in the United States.

--Execution of studies showing the economic benefits of preventive conservation as opposed to interventive restoration, i.e. how deferred maintenance and care result in higher capital costs in the long run because more invasive interventions are needed.
--Exploration of “carrots and sticks” to encourage preventive conservation

--Consideration of updating the Secretary of the Interior’s Standards and/or National Historic Preservation Act and/or other federal policies to emphasize preventive care.

**Education**

--Development of workshops and training programs, perhaps through public-private partnerships, addressing different professions and their respective roles in the implementation of preventive conservation. For example, workshops addressing the steward could focus upon: How to understand your building; how to prioritize areas of inspection in order to address structural and culturally significant elements; when to inspect/observe the resource and how to inspect/observe; how to record observations—using base drawings, photos, record books, etc.; how to store the documentation; how to link cause and effect and separate them; how to determine when it is appropriate to call appropriate consultants.

**Funding**

--More in-depth investigation into the opportunities and limitations of public and private sector financial support.

**IV. Closing Remarks**

Regardless if one agrees or not that there is a distinction between preventive conservation and preventive/cyclical maintenance, it is revealed by the majority of survey respondents that historic house museums in the United States are poorly equipped to address any version
of proactive historic building care. This is reported by the survey respondents to be because of lack of supporting budgets, staffing, and training, as well as the lack of access to and affordability of professional expertise, skilled craftspeople, and software tools to track conservation/maintenance. This lack of budgeting, staffing, and training resulting from the absence of philosophical and financial public and private sector support can only be fulfilled through collaboration of stakeholders and the establishment of leadership in the advocacy for preventive care of historic buildings. The longevity of the past for the present and future generations depends upon a public-private team approach towards proactive building care, because we cannot afford, either literally or figuratively, the consequences of further reactive care.
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LECTURES

NATIONAL AND INTERNATIONAL LEGISLATION


WEBSITES

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Appendix A
Definitions Table

The definitions developed for the purposes of this thesis have been influenced by the definitions endorsed by NPS, AIC, and Colonial Williamsburg, as well as selected survey responses.

All international definitions unless noted are from Australia ICOMOS Burra Charter (original 1979, revised, 1999) http://www.icomos.org/australia/burra.html 20 April 2008

All national definitions are from:

All AIC definitions are from: http://aic.stanford.edu/about/coredocs/defin.html 4 April 2008.

All Colonial Williamsburg definitions are from:
<table>
<thead>
<tr>
<th>Terms</th>
<th>Definitions used in this thesis</th>
<th>International Definitions</th>
<th>Definitions according to NPS</th>
<th>Definitions according to AIC</th>
<th>Definitions according to Colonial Williamsburg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection</td>
<td>not used</td>
<td>not addressed</td>
<td>component to preservation</td>
<td>component to preservation</td>
<td>&quot;Treatment...guarding from deterioration...of a temporary nature...&quot;</td>
</tr>
<tr>
<td>Stabilization</td>
<td>not used</td>
<td>not addressed</td>
<td>mentioned as component to preservation</td>
<td>&quot;Treatment...to maintain the integrity...&quot;</td>
<td>&quot;Treatment...to maintain structural stability...&quot;</td>
</tr>
<tr>
<td>Preservation</td>
<td>retention and protection</td>
<td>&quot;...maintaining...and retarding deterioration.&quot;</td>
<td>&quot;...applying measures necessary to sustain the existing...&quot;</td>
<td>&quot;protection...through activities that...prolong the existence...&quot;</td>
<td>&quot;Treatment...to sustain the existing form, integrity, and material...&quot;</td>
</tr>
<tr>
<td>Rehabilitation</td>
<td>re-establishment of the utility. Related to adaptive (re)use.</td>
<td>&quot;...modifying a place to suit the existing use or a proposed use.&quot;</td>
<td>&quot;...making possible a compatible use for a property...&quot;</td>
<td>not addressed</td>
<td>&quot;Treatment...to return a property to a state of utility...&quot;</td>
</tr>
<tr>
<td>Restoration</td>
<td>return to its appearance during a period of significance...</td>
<td>&quot;...returning the existing fabric of a place to a known earlier state...&quot;</td>
<td>&quot;...accurately depicting...as it appeared at a particular period of time...&quot;</td>
<td>&quot;Treatment...to return cultural property to a known or assumed state...&quot;</td>
<td>&quot;Treatment...to accurately recover...as it appeared at a particular period of time...&quot;</td>
</tr>
<tr>
<td>Reconstruction</td>
<td>recreation of fabric</td>
<td>&quot;...returning a place to a known earlier state...introduction of new material...&quot;</td>
<td>&quot;...depicting, by means of new construction, the form, features, and detailing of a non-surviving site...&quot;</td>
<td>not addressed</td>
<td>not addressed</td>
</tr>
<tr>
<td>Conservation</td>
<td>a reactive and interventive treatment</td>
<td>&quot;...all the processes of looking after a place so as to retain its cultural significance.&quot;</td>
<td>not addressed</td>
<td>&quot;The profession devoted to the preservation of cultural property for the future...&quot;</td>
<td>&quot;...the profession devoted to the preservation of architecture for the future...&quot;</td>
</tr>
<tr>
<td>Preventive Conservation</td>
<td>a proactive philosophy. Based upon frequent, informed observation and documentation</td>
<td>&quot;...early identification of possible damage...avoiding the progression of damage...time and frequency is crucial...&quot;</td>
<td>assumed to be synonymous with &quot;preventive care&quot; and therefore &quot;maintenance&quot; (see &quot;Maintenance&quot;)</td>
<td>&quot;mitigation of deterioration and damage&quot;; &quot;an ongoing process&quot;</td>
<td>&quot;Preventive Care&quot;; &quot;mitigation of deterioration and damage to a property...&quot;</td>
</tr>
<tr>
<td>Maintenance</td>
<td>actions of servicing and repair that are scheduled in response to failure</td>
<td>&quot;...continuous protective care...distinguished from repair...&quot;</td>
<td>&quot;...regular upkeep and preservation...regular inspections, monitoring, seasonal maintenance work...&quot;</td>
<td>as part of preventive care/ preventive conservation</td>
<td>as part of preventive care</td>
</tr>
<tr>
<td>Preventive Maintenance</td>
<td>scheduled actions of servicing and repair to stave off incipient failure.</td>
<td>not addressed</td>
<td>See &quot;Maintenance&quot;</td>
<td>not addressed</td>
<td>not addressed</td>
</tr>
<tr>
<td>Cyclical Maintenance</td>
<td>actions of servicing and repair is scheduled a year or more in advance, often in coincidence with the seasons.</td>
<td>not addressed</td>
<td>See &quot;Maintenance&quot;</td>
<td>not addressed</td>
<td>not addressed</td>
</tr>
</tbody>
</table>
Appendix B
Definitions

The definitions developed for the purposes of this thesis have been influenced by the definitions endorsed by NPS, AIC, and Colonial Williamsburg, as well as selected survey responses.

All international definitions unless noted are from Australia ICOMOS Burra Charter (original 1979, revised, 1999) http://www.icomos.org/australia/burra.html 20 April 2008

All national definitions are from:

All AIC definitions are from: http://aic.stanford.edu/about/coredocs/defin.html 4 April 2008.

All Colonial Williamsburg definitions are from:
Protection

In this thesis
Not used

International Definition
Not addressed

Definition according to NPS
Not addressed

Definition according to AIC
Not addressed

Definition according to Colonial Williamsburg
"Treatment intended to affect the physical condition of a property by defending or guarding it from deterioration, loss or attack, or to cover or shield the property from danger or injury. Such treatment is generally of a temporary nature and anticipates future treatments."

Stabilization

In this thesis
Not used

International Definition
Not addressed

Definition according to NPS
Not addressed
Definition according to AIC

"Treatment procedures intended to maintain the integrity of the architecture and to minimize deterioration."

Definition according to Colonial Williamsburg

"Treatment procedures intended to maintain the integrity of the architecture and to minimize deterioration. Such treatment is intended to maintain structural stability of an unsafe property while maintaining the essential form as it exists at present."

Preservation

In this thesis

(1) Retention and protection of (through non-invasive measures) the historically significant elements; (2) Has become the overarching term in the United States for all actions to ensure longevity of (a) physical fabric (an element, a building, a site, a city, and region), and (b) social and cultural fabric, i.e. "The Preservation Movement"

International Definition

"Preservation means maintaining the fabric of a place in its existing state and retarding deterioration."

Definition according to NPS

"Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction."

http://www.nps.gov/history/hps/tps/standguide/preserve/preserve_index.htm

Definition according to AIC

"The protection of cultural property through activities that minimize chemical and physical deterioration and damage and that prevent loss of informational content. The primary goal of preservation is to prolong the existence of cultural property."
**Definition according to Colonial Williamsburg**

"Treatment procedures intended to minimize the chemical and physical deterioration and damage and that prevent loss of informational content. Such treatment is intended to sustain the existing form, integrity, and material of a structure as well as the existing form and features of a site."

**Rehabilitation**

In this thesis

Re-establishment of the utility of an element of cultural heritage property believed to be of primary significance. Related to “adaptive (re)use.”

**International Definition**

Uses the term "Adaptation." "Adaptation means modifying a place to suit the existing use or a proposed use."

**Definition according to NPS**

"Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.”

http://www.nps.gov/history/hps/tps/standguide/rehab/rehab_index.htm

**Definition according to AIC**

Not addressed

**Definition according to Colonial Williamsburg**

"Treatment procedures intended to return a property to a state of utility through repair or alteration which makes possible an efficient contemporary use while preserving those portions or features of a property which are significant to its historical, architectural, and cultural values."
**Restoration**

In this thesis

Returning an element to its appearance during a period of significance in its history.

**International Definition**

"Restoration means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material."

**Definition according to NPS**

"Restoration is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period."

http://www.nps.gov/history/hps/tps/standguide/restore/restore_index.htm

**Definition according to AIC**

"Treatment procedures intended to return cultural property to a known or assumed state, often through the addition of non-original material."

**Definition according to Colonial Williamsburg**

"Treatment procedures intended to accurately recover the form and details of a property and its setting as it appeared at a particular period of time by means of the removal of later work or by the replacement of missing earlier work."

**Reconstruction**

In this thesis

The recreation of fabric.
International Definition

"Reconstruction means returning a place to a known earlier state and is distinguished from restoration by the introduction of new material into the fabric."

Definition according to NPS

"Reconstruction is defined as the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location."

http://www.nps.gov/history/hps/tps/standguide/reconstruct/reconstruct_index.htm

Definition according to AIC

Not addressed

Definition according to Colonial Williamsburg

Not addressed

Conservation

In this thesis

A reactive and interventive treatment philosophy to ensure the longevity of the culturally-significant built environment through the implementation of periodic, episodic repair and restoration. Strategic conditions monitoring and frequent, informed observation may or may not be addressed in any follow-up work.

International Definition

"Conservation means all the processes of looking after a place so as to retain its cultural significance."
Definition according to NPS

"The profession devoted to the preservation of cultural property for the future. Conservation activities include examination, documentation, treatment, and preventive care, supported by research and education."

Definition according to AIC

"The profession devoted to the preservation of cultural property for the future. Conservation activities include examination, documentation, treatment, and preventive care, supported by research and education."

Definition according to Colonial Williamsburg

"Architectural Conservation is the profession devoted to the preservation of architecture for the future. Architectural conservation activities include examination, documentation, treatment, and preventive care, supported by research and education."

Preventive Conservation

In this thesis

A proactive philosophy aiming to ensure the longevity of the culturally-significant built environment. Measures that mitigate decay, including the realization of cleaning and coating programs and design nuances (like installation of metal strips along rooflines to prevent bio-growth) compatible with the Secretary of the Interior’s Standards for Historic Properties, may be considered as preventive measures. Central to the philosophy of preventive conservation is the establishment of an accessible and comprehensible system for the recordation of the historic property stewards’ frequent, informed observation of building conditions, enabling the steward to minimize probable deterioration risk factors.

International Definition

"Preventive conservation consists of an early identification of possible damage, in avoiding the progression of damage or in reducing of negative effects caused by damage. In these actions, time and frequency is crucial. . . preventive conservation implies (1) analysis and diagnosis of damages and degradation; (2) documentation, which develops into monitoring over time; (3) maintenance; (4) minor compatible and durable interventions."

---Seminar on PREventive Conservation and Monitoring of Architectural Heritage (SPRECOMAH)
Definition according to NPS

Not directly called-out, but may be assumed to be synonymous with "preventive care" and therefore "maintenance" (see "Maintenance")

Definition according to AIC

"Preventive Care (also referred to as preventive conservation): The mitigation of deterioration and damage to cultural property through the formulation and implementation of policies and procedures for the following: appropriate environmental conditions; handling and maintenance procedures for storage, exhibition, packing, transport, and use; integrated pest management; emergency preparedness and response; and reformatting/duplication." Commentary 20 "Preventive Conservation" continues: "Preventive conservation is an ongoing process that continues throughout the life of cultural property, and does not end with interventive treatment."--AIC Code of Ethics and Guidelines for Practice

Definition according to Colonial Williamsburg

"Preventive Care"

"The mitigation of deterioration and damage to a property through the formulation and implementation of policies and procedures for the following: environmental conditions, maintenance, integrated pest management, safety and security, and emergency preparedness and response."

Maintenance

In this thesis

Refers to actions of servicing and repair that are scheduled in response to failures The objective of maintenance is to regain utility.

International Definition

"Maintenance means the continuous protective care of the fabric and setting of a place, and is to be distinguished from repair. Repair involves restoration or reconstruction."
Definition according to NPS

PB 47: "Maintenance" as an all-encompassing term: "...repetitive tasks consistently according to a set schedule...routine and preventive care...regular upkeep and preservation...regular inspections, monitoring, seasonal maintenance work..."

J.H. Chambers, NPS "Maintenance of buildings is not a single branch of learning or a single trade capable of definition. It is a mongrel science of a varied ancestry: part architecture, part physical chemistry, part management, and more. Maintenance in historic building terms is preservation maintenance consisting of all those day to day activities necessary to prolong the life of an historic property. The maintenance craftsperson is an individual with the necessary skill to make minor repairs to and replacements of building elements; this skill also includes the knowledge of what not to do."

Definition according to AIC

Not addressed

Definition according to Colonial Williamsburg

Not addressed

Preventive Maintenance

In this thesis

Refers to scheduled actions of servicing and repair to stave off incipient failure.

International Definition

Not addressed

Definition according to NPS

See “Maintenance”

Definition according to AIC

Not addressed
**Definition according to Colonial Williamsburg**

Not addressed

---

**Cyclical Maintenance**

In this thesis

Is distinguished by actions of servicing and repair that are anticipated and therefore scheduled a year or more in advance, often in coincidence with the seasons.

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**International Definition**

Not addressed

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**Definition according to NPS**

See “Maintenance”

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**Definition according to AIC**

Not addressed

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**Definitions according to Colonial Williamsburg**

Not addressed
Preservation Briefs

Maintaining the Exteriors of Small and Medium Size Historic Buildings

Sharon C. Park, FAIA

Preservation is defined as "the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction." 1

Maintenance helps preserve the integrity of historic structures. If existing materials are regularly maintained and deterioration is significantly reduced or prevented, the integrity of materials and workmanship of the building is protected. Proper maintenance is the most cost effective method of extending the life of a building. As soon as a building is constructed, restored, or rehabilitated, physical care is needed to slow the natural process of deterioration. An older building has already experienced years of normal weathering and may have suffered from neglect or inappropriate work as well.

Decay is inevitable but deterioration can accelerate when the building envelope is not maintained on a regular basis. Surfaces and parts that were seamlessly joined when the building was constructed may gradually become loose or disconnected; materials that were once sound begin to show signs of weathering. If maintenance is deferred, a typical response is to rush in to fix what has been ignored, creating additional problems. Work done on a crisis level can favor inappropriate treatments that alter or damage historic material.

There are rewards for undertaking certain repetitive tasks consistently according to a set schedule. Routine and preventive care of building materials is the most effective way of slowing the natural process of deterioration. The survival of historic buildings in good condition is primarily due to regular upkeep and the preservation of historic materials.

Well-maintained properties tend to suffer less damage from storms, high winds, and even small earthquakes. Keeping the roof sound, armatures and attachments such as shutters tightened and secured, and having joints and connections functioning well, strengthens the ability of older buildings to withstand natural occurrences.

Over time, the cost of maintenance is substantially less than the replacement of deteriorated historic features and involves considerably less disruption. Stopping decay before it is widespread helps keep the scale and complexity of work manageable for the owner.

This Preservation Brief is designed for those responsible for the care of small and medium size historic buildings, including owners, property administrators, in-house maintenance staff, volunteers, architects, and maintenance contractors. The Brief discusses the benefits of regular inspections, monitoring, and seasonal maintenance work; provides general guidance on maintenance treatments for historic building exteriors; and emphasizes the importance of keeping a written record of completed work.

Getting Started

Understanding how building materials and construction details function will help avoid treatments that are made in an attempt to simplify maintenance but which may also result in long-term damage. It is enticing to read about "maintenance free" products and systems, particularly waterproof sealers, rubberized paints, and synthetic siding, but there is no such thing as maintenance free when it comes to caring for historic buildings. Some approaches that initially seem to reduce maintenance requirements may over time actually accelerate deterioration.

Exterior building components, such as roofs, walls, openings, projections, and foundations, were often constructed with a variety of functional features, such as overhangs, trim pieces, drip edges, ventilated cavities, and painted surfaces, to protect against water infiltration, ultraviolet deterioration, air infiltration, and...
Cautions During Maintenance Work

All maintenance work requires attention to safety of the workers and protection of the historic structure. Examples include the following:

- Care should be taken when working with historic materials containing lead-based paint. For example, damp methods may be used for sanding and removal to minimize air-borne particles. Special protection is required for works and appropriate safety measures should be followed.
- Materials encountered during maintenance work, such as droppings from pigeons and mice, can cause serious illnesses. Appropriate safety precautions need to be followed. Services of a licensed contractor should be obtained to remove large deposits from attics and crawlspaces.
- Heat removal of paint involves several potential safety concerns. First, heating of lead-containing paint requires special safety precautions for workers. Second, even at low temperature levels, heat removal of paint runs the risk of igniting debris in walls. Heat should be used only with great caution with sufficient coverage by smoke detectors in work areas. Work periods need to be timed to allow monitoring after completion of paint removal each day, since debris will most often smolder for a length of time before breaking out into open flame. The use of torches, open flames, or high heat should be avoided.
- Many chemical products are hazardous and volatile organic compounds (VOC) are banned in many areas. If allowed, appropriate respirators and other safety precautions are essential for use.
- Personal protection is important and may require the use of goggles, gloves, mask, closed-toed shoes, and a hard hat.
- Electrical service should be turned off before inspecting a basement after a flood or heavy rain, where there is high standing water.

Post intersation. Construction assemblies and joints between materials allow for expansion and contraction and the diffusion of moisture vapor, while keeping water from penetrating the building envelope. Older buildings use such features effectively and care must be taken to retain them, avoiding the temptation to reduce air infiltration or otherwise alter them.

Monitoring, inspections, and maintenance should all be undertaken with safety in mind. Besides normal safety procedures, it is important to be cognizant of health issues more commonly encountered with older buildings, such as lead-based paint, asbestos, and bird droppings, and to know when it is necessary to seek professional services (see sidebar).

Original building features and examples of special craftsmanship should be afforded extra care. The patina or aging of historic materials is often part of the charm and character of historic buildings. In such cases, maintenance should avoid attempts to make finishes look new by over-cleaning or cladling existing materials. As with any product that has the potential to harm historic materials, the selection of a cleaning procedure should always involve testing in a discreet location on the building to ensure that it will not abrade, fade, streak, or otherwise damage the substrate (Fig. 1).
**Maintenance Plan, Schedules and Inspection**

Organizing related work into a written set of procedures, or a Maintenance Plan, helps eliminate duplication, makes it easier to coordinate work effort, and creates a system for prioritizing maintenance tasks that takes into account the most vulnerable and character-defining elements.

The first time a property owner or manager establishes a maintenance plan or program, it is advisable to have help from a preservation architect, preservation consultant, and/or experienced contractor. Written procedures should outline step-by-step approaches that are custom-tailored to a building. No matter how small the property, every historic site should have a written guide for maintenance that can be as simple as:

1. Schedules and checklists for inspections;
2. Forms for recording work, blank base plans and elevations to be filled in during inspections and upon completion of work;
3. A set of base-line photographs to be augmented over time;
4. Current lists of contractors for help with complex issues or in case of emergencies;
5. Written procedures for the appropriate care of specific materials, including housekeeping, routine care, and preventive measures;
6. Record-keeping sections for work completed, costs, warranty cards, sample paint colors, and other pertinent materials.

This information can be kept in one or more formats such as a three-ring binder, file folders, or a computer database. It is important to keep the files current with completed work forms to facilitate long-term evaluations and planning for future work (Fig. 2).

Proper maintenance depends on an organized plan with work prescribed in manageable components. Regular maintenance needs to be considered a priority both in terms of time allotted for inspections and for allocation of funding.

Maintenance work scheduling is generally based on a variety of factors, including the seriousness of the problem, type of work involved, seasonal appropriateness, product manufacturer's recommendations, and staff availability. There are other variables as well. For example, building materials and finishes on southern and western exposures will often weather faster than those on northern or eastern exposures. Horizontal surfaces facing skyward usually require greater maintenance than vertical ones; in regions with moderate or heavy rainfall, wood and other materials in prolonged shadow are subject to more rapid decay.

Maintenance costs can be controlled, in part, through careful planning, identification of the amount of labor required, and thoughtful scheduling of work. Maintenance schedules should take into account daily and seasonal activities, the property in order to maximize the uninterrupted time necessary to complete the work. Institutions generally need to budget annually between 2 and 4 percent of the replacement value of the building to underwrite the expense of full building maintenance. Use of trained volunteers to undertake maintenance can help reduce costs.

Exterior inspections usually proceed from the roof down to the foundation, working on one elevation of

<table>
<thead>
<tr>
<th><strong>Cyclic Building Inspection Checklist: Horse Stable</strong></th>
<th>Inspection date: 04/24/05</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Building Feature</strong></td>
<td><strong>Material(s)</strong></td>
</tr>
<tr>
<td>ROOF</td>
<td></td>
</tr>
<tr>
<td>Covering</td>
<td>Clay tile</td>
</tr>
<tr>
<td></td>
<td>Painted metal standing seam</td>
</tr>
<tr>
<td>Flashing</td>
<td>Painted metal</td>
</tr>
<tr>
<td>Gutters/ Downspouts</td>
<td>6&quot; half round galvanized metal</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Châteaux</td>
<td>No masonry chimney</td>
</tr>
<tr>
<td>Attic areas/ Penetrations</td>
<td>Metal vent stack and weathering</td>
</tr>
</tbody>
</table>

*Figure 2.* All personnel associated with a historic structure need to become acquainted with how existing building features should appear and during their daily or weekly routines look for changes that may occur. This will help augment the regular maintenance inspection that will occur at specified intervals based on seasonal changes, use, and other factors. A segment of an inspection form showing the roof elements of a horse stable is shown. The inspection report should be kept along with the maintenance plan and other material in notebook, file or electronic form.
a time, moving around the building in a consistent direction. On the interior, the attic, inside surfaces of exterior walls, and crawlspace or basements should be examined for signs of potential or existing problems with the building envelope.

The following chart lists suggested inspection frequencies for major features associated with the building's exterior, based on a temperate four-season climate and moderate levels of annual rainfall. For areas of different climate conditions and rainfall, such as in the more arid southwest, the nature of building decay and frequency of inspections will vary. For buildings with certain inherent conditions, heavy use patterns, or locations with more extreme weather conditions, the frequency of inspections should be altered accordingly.

*Note: All building features should be inspected after any significant weather event such as a severe rainstorm or unusually high winds.*

### INSPECTION FREQUENCY CHART

<table>
<thead>
<tr>
<th>Feature</th>
<th>Minimum inspection frequency</th>
<th>Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roof</td>
<td>Annually</td>
<td>Spring or fall; every 5 years by roofer</td>
</tr>
<tr>
<td>Chimneys</td>
<td>Annually</td>
<td>Fall, prior to heating season; every 5 years by insurance</td>
</tr>
<tr>
<td>Roof Drainage</td>
<td>Every 6 months; more frequently as needed</td>
<td>Before and after wet season, during heavy rain</td>
</tr>
<tr>
<td>Exterior Walls and Porches</td>
<td>Annually</td>
<td>Spring, prior to summer/fall painting season</td>
</tr>
<tr>
<td>Windows</td>
<td>Annually</td>
<td>Spring, prior to summer/fall painting season</td>
</tr>
<tr>
<td>Foundation and Grade</td>
<td>Annually</td>
<td>Spring or during wet season</td>
</tr>
<tr>
<td>Building Perimeter</td>
<td>Annually</td>
<td>Winter, after leaves have dropped off trees</td>
</tr>
<tr>
<td>Entryways</td>
<td>Annually; heavily used entries may merit greater frequency</td>
<td>Spring, prior to summer/fall painting season</td>
</tr>
<tr>
<td>Doors</td>
<td>6 months; heavily used entry doors may merit greater frequency</td>
<td>Spring and fall; prior to heating/cooling seasons</td>
</tr>
<tr>
<td>Attic</td>
<td>4 months, or after a major storm</td>
<td>Before, during and after wet season</td>
</tr>
<tr>
<td>Basements/Crawlspace</td>
<td>4 months, or after a major storm</td>
<td>Before, during and after rain season</td>
</tr>
</tbody>
</table>

Survey observations can be recorded on a standardized report form and photographs taken as a visual record. All deficient conditions should be recorded and placed on a written schedule to be corrected or monitored.

### BUILDING COMPONENTS

For purposes of this discussion, the principal exterior surface areas have been divided into five components and are presented in order from the roof down to grade. While guidance for inspection and maintenance is provided for each component, this information is very general in nature and is not intended to be comprehensive in scope. Examples have been selected to address some typical maintenance needs and to help the reader avoid common mistakes.

**Roofs/chimneys**

The roof is designed to keep water out of a building. Thus one of the principal maintenance objectives is to ensure water flows off the roof and into functional gutters and downspouts directly to grade and away from the building—and to prevent water from penetrating the attic, exterior walls, and basement of a building. (Note: Some buildings were designed without gutters and thus assessments must be made as to whether rain water is being properly addressed at the foundation and perimeter grade.) Keeping gutters and downspouts cleared of debris is usually high on the list of regular maintenance activities (Fig 3). Flashing around chimneys, parapets, dormers, and other appendages to the roof also merit regular inspection and appropriate maintenance when needed. The material covering the roof—wood shingles, slate, tile, asphalt, sheet metal, rolled roofing—requires maintenance both to ensure a watertight seal and to lengthen its service life; the type and frequency of maintenance varies with the roofing materials. Older chimneys and parapets also require inspection and maintenance. With the exception of cleaning and minor repairs to gutters and downspouts, most roof maintenance work will necessitate use of an outside contractor.

**Inspection:**

The functioning of gutters and downspouts can be safely observed from the ground during rainy weather and when winter ice has collected. Binoculars are a useful tool in identifying potential roof problems from the same vantage point. Careful observation from grade helps to identify maintenance needs between close-up inspections by an experienced roofer. Observation from the building interior is also important to identify possible leak locations. When access can be safely gained to the roof, it is important to wear shoes with slip-resistant soles and to use safety ropes.
Depending on the nature of the roof, some common conditions of concern to look for are:

- sagging gutters and split downspouts;
- debris accumulating in gutters and valleys;
- overhanging branches rubbing against the roof or gutters;
- plant shoots growing out of chimneys;
- slipped, missing, cracked, buckling, delaminating, peeling, or broken roof coverings;
- deteriorated flashing and falling connections at any intersection of roof areas or of roof and adjacent wall;
- bubbled surfaces and moisture ponding on flat or low-sloped roofs;
- evidence of water leaks in the attic;
- misaligned or damaged elements, such as decorative crested, lightning rods, or antennas; and
- cracked masonry or dislodged chimney caps.

Maintenance:

- Remove leaves and other debris from gutters and downspouts. Utilize a ladder with a brace device if necessary, to keep the ladder from crashing the gutter. Use a garden hose to flush out troughs and downspouts. Patch or repair holes in gutters using products such as fiberglass tape and epoxy adhesive in metal gutters. Avoid asphalt compounds since acidic material can cause further deterioration of metal gutters.

- Correct misaligned gutters and adjust, if necessary, so that water flows to drains and does not pond. If gutter edges sag, consider inserting wooden wedges between the fascia board and the back of the gutter to add support. Seal leaking seams or pinholes in gutters and elbows.

- Broom sweep branch or leaf debris away from shingles, valleys, and chimneys, particularly around chimneys and dormers.

- Where mechanical equipment is mounted on flat or low-sloped roofs, ensure that access for maintenance can be provided without damaging the roof. Clean out trapped leaves and debris from around equipment base and consider adding a protective walkway for access.

- Remove biological growth where it is causing erosion or exfoliation of roofing. Use low-pressure garden hose water and a natural or nylon scrubbing brush to remove such growth, scraping with a plastic putty knife or similar wood or plastic tool as needed on heavier buildup. Most growth is acidic and while there are products designed to kill spores, such as diluted chlorine bleach, they should be avoided. Even fairly weak formulas can still cause unexpected color changes, efflorescence, or over-splash damage to plantings or surfaces below the roof. Where appropriate, trim adjacent tree branches to increase sunlight on the roof since sunlight will deter further biological growth.

- Re-secure loose flashing at the dormers, chimneys, or parapets. Clean out old mortar, lead, lead wash, or fastening material and make sure that flashing is properly inserted into reglet (slot) joints, taking care not to damage the substrate. Avoid installing new step flashing as a single metal component where multiple pieces are required to provide proper waterproofing. Also avoid attaching step flashing with mastic or sealant. Properly re-bed all step flashing. Use appropriate non-ferrous flashing metal or painted metal if needed. Since cap, step, valley, cricket, and apron flashings each have specific overlap and extension requirements, replacement flashing should match the existing material unless there has been a proven deficiency.
Repoint joints in chimneys, parapet, or balustrade capping stones using a hydraulic lime mortar or other suitable mortar where the existing mortar has eroded or cracked, allowing moisture penetration. In general, a mortar that is slightly weaker than the adjacent masonry should be used. This allows trapped moisture in the masonry to migrate out through the mortar and not the masonry. Spalled masonry is often evidence of the previous use of a mortar mix that was too hard.

Use professional services to repair chimneys and caps. Avoid the use of mortar washes on masonry since they tend to crack, allowing moisture to penetrate and promoting masonry spalling. Repoint masonry with a durable mortar that is slightly weaker than the adjacent masonry. Slope the masonry mortar cap to ensure drainage away from the flue. If a chimney rain cap is installed, ensure adequate venting and exhaust.

As a temporary measure, slip pieces of non-corrosive metal flashing under or between damaged and missing roofing units until new slate, shingles, or tile can be attached. Repair broken, missing or damaged roofing units with ones that match. Follow roofing supplier and industry guidance on inserting and attaching replacement units (Fig 4). Avoid using temporary asphalt patches as it makes a proper repair difficult later on.

For long-term preservation of wooden shingle roofs coated with a preservative, recoat every few years following the manufacturer’s recommendations. Be aware of environmental considerations.

Scrape and repaint selected areas of coated ferrous metal roofing as needed; repaint on a regular basis. Ferrous metal roofs can last a long time if painted regularly. Alkyd coatings are generally used on metal roofs; be sure to wash and properly prepare the area beforehand. Environmental regulations may restrict the use of certain types of paints. Apply the coating system in accordance with manufacturer’s recommendations. Prepare the surface prior to application to obtain good adhesion with the primer coat. Apply both a prime coat and a topcoat for good bonding and coverage; select primer and topcoat products from the same manufacturer.

Re-secure loose decorative elements, such as finials and weather vanes. Seek professional advice if decorative elements exhibit considerable corrosion, wood rot, or structural instability. Small surface cracks may benefit from a flexible sealant to keep moisture out; sealants have a limited life and require careful inspection and periodic replacement (Fig 5).

**Exterior Walls**

Exterior walls are designed to help prevent water infiltration, control air infiltration, and serve as a barrier for unwanted animals, birds and insects. The primary maintenance objective is to keep walls in sound condition and to prevent water penetration, insect infestation, and needless decay (Fig 6). Depending on the materials and construction methods, walls should have an even appearance, free from unwanted cracks, and should be able to shed excess moisture. Where surfaces are significantly misaligned or where there are bulging wall sections...
or cracks indicative of potential structural problems, seek professional guidance as to the cause of distress and appropriate corrective measures. Wood-frame construction generally will require more frequent maintenance than buildings constructed of brick, stone, or terra cotta (Fig. 7).

Inspections:

It is best to inspect walls during dry as well as wet weather. Look for moisture patterns that may appear on the walls after a heavy or sustained rainfall or snow, recording any patterns on elevation drawings or standard recording forms. Monitoring the interior wall for moisture or other potential problems is important as well. Look for movement in cracks, joints, and around windows and doors and try to establish whether movement is seasonal in nature (such as related to shrinkage of wood during dry weather) or signs of an ongoing problem. For moderate size buildings, a ladder or mechanical lift may be necessary, though in some cases the use of binoculars and observations made from windows and other openings will be sufficient. When examining the walls, some common conditions of concern to look for are:

- Misaligned surfaces, bulging wall sections, cracks in masonry units, diagonal cracks in masonry joints, spalling masonry, open joints, and nail popping;
- Evidence of wood rot, insect infestation, and potentially damaging vegetative growth;
- Deficiencies in the attachment of wall mounted lamps, flag pole brackets, signs, and similar items;
- Potential problems with penetrating features such as water spigots, electrical outlets, and vents;
- Excessive damp spots, often accompanied by staining, peeling paint, moss, or mold; and
- General paint problems (Fig. 8).

Maintenance:

- Trim tree branches away from walls. Remove ivy and tendrils of climbing plants by first cutting at the base of the vine to allow tendrils to die back. Later use a plastic scraper to dislodge debris and an appropriate digging tool to dislodge and remove root systems. Be cautious if using a commercial chemical to accelerate root decay; follow safety directions and avoid contact of chemicals with working and wall materials.
- Wash exterior wall surfaces if dirt or other deposits are causing damage or hiding deterioration; extend...
scheduled times for cleaning for cosmetic purposes to reduce frequency (Fig. 9). When cleaning, use the gentlest means possible; start with natural bristle brushes and water and only add a mild phosphate-free detergent if necessary. Use non-abrasive cleaning methods and low-pressure water from a garden hose. For most building materials, such as wood and brick, avoid abrasive methods such as mechanical scrapers and high-pressure water or air and such additives as sand, natural soda, ice crystals, or rubber produces. All abrasives remove some portion of the surface and power-washing drives excessive moisture into wall materials and even into wall cavities and interior walls. If using a mild detergent, two people are recommended, one to brush and one to premix and rinse. When graffiti or stains are present, consult a preservation specialist who may use poultices or mild chemicals to remove the stain. If the entire building needs cleaning other than described above, consult a specialist.

- Repoint masonry in areas where mortar is loose or where masonry units have settled. Resolve cause of cracks or failure before resetting units and repointing. Rake out joints by hand, generally avoiding rotary saws or drills, to a depth of 2 1/2 times the width of the joint (or until sound mortar is encountered), to make sure that fresh mortar will not pop out. Repointing mortar should be lime-rich and formulated to be slightly weaker than the masonry units and to match the historic mortar in color, width, appearance, and setting. Off-the-shelf premixed cement mortars are not appropriate for most historic buildings. Avoid use of joint sealants in place of mortar on vertical masonry wall surfaces, as they are not breathable and can lead to moisture-related damage of the adjacent masonry (Fig. 10).

- Correct areas that trap unwanted moisture. Damaged bricks or stone units can sometimes be removed, turned around, and reset, or replaced with salvaged units. When using traditional or contemporary materials for patching wood, masonry, metal, or other materials, ensure that the materials are compatible with the substrate; evaluate strength, vapor permeability, and thermal expansion, as well as appearance.

- When patching is required, select a compatible patch material. Prepare substrate and install patch material according to manufacturer's recommendations; respect existing joints. Small or shallow surface defects may not require patching; large or deep surface defects may be better addressed by installation of a dutchman unit than by patching.

- Where a damaged area is too large to patch, consider replacing the section with in-kind material. For stucco and adobe materials, traditional patching formulas are recommended.

- When temporarily removing wood siding to repair framing or to tighten corner boards and loose trim, reuse the existing siding where possible. Consider using stainless steel or high-strength aluminum nails as appropriate. Putty or fill nail holes flush with siding prior to repainting. Back-prime any installed wood with

Figure 9. To help extend a repainting cycle, dirt and other spots should be removed before permanent staining occurs. In this case, a natural bristle brush and a soft damp cloth are being used to remove insect debris and refresh the surface appearance.
one coat of primer and coat end grain that might be exposed with two coats of primer.

- Prepare, prime, and spot paint areas needing repainting. Remember that preparation is the key to a successful long lasting paint job. Ensure beforehand the compatibility of new and existing paints to avoid premature paint failure. Remove loose paint to a sound substrate; sand or grind rough surface if needed for a good paint bond; wipe clean; and repaint with appropriate primer and topcoats. Follow manufacturer's recommendations for application of coatings, including temperature parameters for paint application. Use top quality coating materials. Generally paint when sun is not shining directly onto surfaces to be painted.

- Remove deteriorated caulk and sealants, clean, and apply appropriate caulk and sealants using backup pads as necessary. Follow manufacturer's instructions regarding preparation and installation.

- Correct deficiencies in any wall attachments such as wiring and flag pole anchors, improperly installed electrical outlets, or loose water spigots.

Openings

Exterior wall openings primarily consist of doors, windows, storefronts, and passageways. The major maintenance objectives are to retain the functioning nature of the opening and to keep in sound condition the insulation between the opening and the wall in order to reduce air and water infiltration.

Inspection:

Wall openings are typically inspected from inside as well as out. Examinations should include the overall material condition, a check for unwanted water penetration, insect infiltration, or animal entry; and identification of where openings may not be properly functioning. Frames should be checked to make sure they are not loose and to ascertain whether the intersection between the wall and the frame is properly sealed. Secure connections of glazing to sash and between sash and frames are also important. Particular attention should be placed on exposed horizontal surfaces of storefronts and window frames as they tend to deteriorate much faster than vertical surfaces. Inspections should identify:

- loose frames, doors, sash, shutters, screens, storefront components, and signs that present safety hazards;
- slipped sills and tipped or cupped thresholds;
- poorly fitting units and storm assemblies, misaligned frames, drag marks on thresholds from sagging doors and storm doors;
- loose, open, or decayed joints in door and window frames, doors and sash, shutters, and storefronts;
- loose hardware, broken sash cords/chains, worn sash pulleys, cracked awning, shutter and window hardware, locking difficulties, and deteriorated weatherstripping and flashing;
- broken/cracked glass, loose or missing glazing and putty;
- peeling paint, corrosion or rust stains; and
- window well debris accumulation, heavy bird droppings, and termite and carpenter ant damage.

Maintenance:

- Replace broken or missing glass as soon as possible; in some cases cracked glass may be repaired using specialty glues. For historic crown glass and early cylinder glass, a conservation approach should be considered to repair limited cracks. Where panes with a distinct appearance are missing, specialty glass should be obtained to match, with sufficient inventory kept for future needs. Avoid using mechanical devices to remove old putty and match historic putty beads or details when undertaking work.
- Reputty window glazing where putty is deteriorated or missing. Take care in removing putty so as not to crack or break old glass or damage muntins and sash frames. Re-glaze with either traditionally formulated...
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Figure 11. Glazing putty should be maintained in sound condition to prevent unwanted air infiltration and water damage. New glazing putty should be pulled tight to the glass and edge of the wood, creating a clean level that matches the historic glass.

- Oil putties or modern synthetic ones, making sure to properly bed the glass and secure with glazing points (Fig 11).
- Clean window glass, door glazing, storefronts, transom prism lights, garage doors, and storm panels using a mild vinegar and water mixture or a non-alkaline commercial window cleaner. Be cautious with compounds that contain ammonia as they may stain brass or bronze hardware elements if not totally removed. When using a squeegee blade or sponge, wipe wet corners with a soft dry cloth. Avoid high-pressure washes.
- Clean handles, locks, and similar hardware with a soft, damp cloth. Use mineral spirits or commercial cleaners very sparingly, as repeated use may remove original finishes. Most metal cleaners include ammonia that can streak and stain metal, so it is important to remove all cleaning residue. Polished hardware subject to tarnishing or oxidation, particularly doorknobs, often benefit from a thin coat of paste wax (carnauba), hand buffed to remove extra residue. Avoid lacquer finishes for high-use areas, as they require more extensive maintenance. Polished finishes should not be cleaned with any chemicals, since the subtle aged appearance contributes to the building’s character.

- Remove and clean hardware before painting doors and windows; reinstall after the paint has dried.
- Tighten screws in doorframes and lubricate door hinges, awning hardware, garage door mechanisms, window sash chains, and pulleys using a graphite or silicone type lubricant.

Contracting Maintenance and Repair Work

Many contractors are very proficient in using modern construction methods and materials; however, they may not have the experience or skill required to carry out maintenance on historic buildings. The following are tips to use when selecting a contractor to work on your historic building:

1. Become familiar with work done on similar historic properties in your area so that you can obtain names of possible preservation contractors.
2. Be as specific as possible in defining the scope of work you expect to undertake.
3. Ask potential contractors for multiple references (three to five) and visit previous work sites. Contact the building owner or manager and ask how the job proceeded; if the same work crew was retained from start to finish, if the workers were of a consistent skill level, whether the project was completed in a reasonable time, and whether the person would use the contractor again.
4. Be familiar with the preservation context of the work to be undertaken. Use the written procedures in your maintenance plan to help define the scope of work in accordance with preservation standards and guidelines. Always request that the gentlest method possible be used. Use a preservation consultant if necessary to ensure that the work is performed in an appropriate manner.
5. Request in the contract proposal a detailed cost estimate that clearly defines the work to be executed, establishes the precautions that will be used to protect adjoining materials, and lists specific qualified subcontractors, if any, to be used.
6. Insure that the contractor has all necessary business licenses and carries worker compensation.
Check weather stripping on doors and windows and adjust or replace as necessary. Use a durable type of weather stripping, such as spring metal or high quality synthetic material, avoiding common brush and bulb or pile weather stripping that require more frequent replacement.

Adjust steel casement windows as needed for proper alignment and tight fit. Avoid additional weather stripping as this may lead to further misalignment, creating pathways for air and water infiltration.

Check window sills for proper drainage. Fill cracks in wood sills with a wood filler or epoxy. Follow manufacturer's instructions for preparation and installation. Do not cover over a wood sill with metal painting, as it may trap moisture and promote decay.

Repair, prime, and repaint windows, doors, frames, and sills when needed. Clean cut putty debris and paint chips from windows using a wet paper towel and dispose of debris prior to repair or repainting. Take appropriate additional precautions when removing lead-based paint. Sand and prepare surfaces and use material-specific patching compounds to fill any holes or areas collecting moisture (Fig 11). Avoid leaving exposed wood unpainted for any length of time, as light will degrade the wood surface and lead to premature failure of subsequent paint applications. Immediately prime steel sash after paint is removed and the substrate prepared for repainting.

Adjust wood sash that bind when operated. Apply beeswax, paraffin, or similar material to tracks or sash runs for ease of movement. If sash are loose, replace worn paring beads. Sash runs traditionally were unpainted between the stop and paring bead; removing subsequent paint applications will often help improve sash operation.

Correct perimeter cracks around windows and doors to prevent water and air infiltration. Use traditional material or modern sealants as appropriate. If fillers such as lead wood have been used, new wood can be inserted with a thin blade tool, taking care to avoid damage to adjacent trim. Reduce excess air infiltration round windows by repainting and lubricating sash locks so that windows close tightly.

Figure 12. Good surface preparation is essential for long lasting paint. Scraping loose paint, filling nail holes and cracks, sanding, and wiping with a damp cloth prior to repainting are all important steps whether touching up small areas or repainting an entire feature. Always use a manufacturer's best quality paint. Windows and shutters may need repainting every five to seven years, depending on exposure and climate.

Figure 13. Window air conditioning units can cause damage to surfaces below when condensation drips in an uncontrolled manner. Drip extension tubes can sometimes be added to direct the discharge.
• Remove debris beneath window air conditioning units and ensure that water from units does not drain onto sills or wall surfaces below (Fig 13). Removal of air conditioning units when not in season is recommended.

• Adjust storm panels and clean weep holes; check that weep holes at the bottom of the panels are open so water will not be trapped on the sill. Exterior applied storm windows are best attached using screws and not tightly adhered with sealant. Use of sealant makes storm units difficult to remove for maintenance and can contribute to moisture entrapment if weep holes become clogged.

• Remove weakened or loose shutters and store for later repair. Consider adding a zinc or painted metal top to shutters as a protective cap to cover the wood’s exposed end grain. This will extend the life of the shutters.

### Projections

Numerous projections may exist on a historic building, such as porches, dormers, skylights, balconies, fire escapes, and breezeways. They are often composed of several different materials and may include an independent roof. Principal maintenance objectives include directing moisture off these features and keeping weathered surfaces in good condition. Secondary projections may include brackets, lamps, hanging signs, and similar items that tend to be exposed to the elements.

#### Inspection:

In some cases, projections are essentially independent units of a building and so must be evaluated carefully for possible settlement, separation from the main body of the building, and materials deterioration. Some electrical features may require inspection by a licensed or service technician. Common conditions of concern to look for are:

- damaged flashing or tie-in connections of projecting elements;
- misaligned posts and railings;
- deteriorated finishes and materials, including peeling paint, cupped and warped decking, wood deterioration, and hazardous steps;
- evidence of termites, carpenter ants, bees, or animal pests (Fig 14);
- damaged lamps, unsafe electrical outlets or deteriorated seals around connections;
- loose marker plaques, signs, or mail boxes; and

![Figure 14. When inspecting connections between projections and the main building, look for areas where birds, bees and pests may enter or exit. Birds have been nesting in this porch roof and the area is being cleaned of their debris. Where an opening exists, it may be necessary to cover it with a trim piece, screening, or instant. Photo: Bryan Ritzel.](image)

- rust and excessive wear of structural, anchorage, and safety features of balconies and fire escapes.

#### Maintenance:

- Selectively repair or replace damaged roofing units on porches and other projections. Ensure adequate drainage away from the building. Repair flashing connections as needed; clean and seal open joints as appropriate.
- Secure any loose connections, such as on porch rails or fire escapes.
- Maintain ferrous metal components by following manufacturer’s recommendation for cleaning and repainting. Remove rust and corrosion from porch handrails, balconies, fire escapes, and other metal features; prepare, prime, and repaint using a corrosion-inhibitive coating system. Apply new primer before new corrosion sets in; follow by new topcoat. Take appropriate safety measures when dealing with existing lead-based paint and in using corrosion-removal products (Fig 15).
- Retackle loose brackets, lamps, or signs. With electrical boxes for outlets or lighting devices, ensure that cover plates are properly sealed. Prime and paint metal elements as needed.
- Keep porch decks and steps free from dust, dirt, leaf debris, and snow as soon as it accumulates using a broom or plastic blade shovel.
- Repair areas of wood decay or other damage to railings, posts, and decorative elements. Repair with wood putty, wood filler, or epoxy filler as appropriate; replace individual elements as needed.
Prune and repaint features when necessary and repaint horizontal surfaces on a more frequent basis.

- Sand and repaint porch floorboards to keep weather surfaces protected. The exposed ends of porch floorboards are especially susceptible to decay and may need to be treated every year or two.
- Carefully cut out damaged or buckled porch flooring and replace with wood to match. Back-prime new wood that is being installed; treat end grain with wood preservative and paint primer. Ensure that new wood is adequately kiln or air-dried to avoid shrinkage and problems with paint adherence.
- Repair rotted stair stringers: adjust grade or add stone pavers at stair base to keep wooden elements from coming into direct contact with soil.
- Consider durable hardwoods for replacement material where beading, chamfering, or other decorative work is required in order to match existing features being replaced. Although appropriate for certain applications, pressure treated lumber is hard to touch and may inhibit paint adherence if not allowed to weather prior to coating application.
- Clean out any debris from carpenter bees, ants, termites, and rodents, particularly from under porches. Replace damaged wood and add screening or lattice to discourage rodents. Consider treating above ground features with a borate solution to deter termites and wood rot and repaint exposed surfaces.

Foundations and Perimeter Grades

The foundation walls that penetrate into the ground, the piers that support raised structures, and the ground immediately around a foundation (known as grade) serve important structural functions. To help sustain these functions, it is important that there is good drainage around and away from the building. The maintenance goal is to prevent moisture from entering foundations and crawl spaces and damaging materials close to the grade, and to provide ventilation in damp areas.

Inspection:

Inspections at the foundation should be done in conjunction with the inspection of the downspouts to ensure that water is being discharged a sufficient distance from the building perimeter to avoid excessive dampness in basements or crawl spaces. In addition, crawl spaces should be adequately vented to deter mold and decay and should be screened or otherwise secured against animals. Look for:

- depressions or grade sloping toward the foundation; standing water after a storm.

Figure 16. The chronic wet area has a militia bloom brought on by heat generated from the air-conditioning cooling unit. The dampness could be caused by a clogged roof gutter, improper grading, or a leaking hose bib.
Scalants and Caulks

Using sealants and caulks has become a familiar part of exterior maintenance today. As the use of precision joinery and certain traditional materials to render joints more weathertight has waned in recent years, caulks and more often elastomeric sealants are used to seal cracks and joints to keep out moisture and reduce air infiltration. Where cracks and failing joints are indicators of a serious problem, sealants and caulks may be used as a temporary measure. In some cases they may actually exacerbate the existing problem, such as by trapping moisture in adjacent masonry, and lead to more costly repairs.

Manufacturer's recommendations provide instructions on the proper application of caulks and sealants. Special attention should be placed on ensuring that the subsurface or joint is properly prepared and cleaned. Backer rods may be necessary for joints or cracks. Tarring of the caulk or sealant is usually necessary to ensure contact with all edge surfaces and for a clean and consistent appearance.

Caulks generally refer to older oil resin-based products, which have relatively limited life span and limited flexibility. Contemporary elastomeric sealants are composed of polymer synthetics. Elastomeric sealants are more durable than caulks and have greater flexibility and wider application. Caulks and sealants can become maintenance problems, as they tend to deteriorate faster than their substrates and must be replaced, periodically as a part of cyclical maintenance of the structure.

The selection criteria for caulks and sealants include type of substrate, adhesion properties, size and configuration of joint, intended appearance/color and paintability, movement characteristics, and service life. Both one-part and two-part sealants are available; the latter require mixing as part of the application process. Sealants are commonly used for a variety of places on the exterior of a building such as around windows and doors, at interfaces between masonry and wood, between various wood features or elements, and at attachments to or through walls or roofs, such as with lamps, signs, or exterior plumbing fixtures. Their effectiveness depends on numerous factors including proper surface preparation and application. Applications of sealants and caulks should be examined as part of routine maintenance inspection, irrespective of their projected life expectancy.

Installation of caulks and sealants often can be undertaken by site personnel. For large and more complex projects, a contractor experienced in sealant installation may be needed. In either case, the sealant manufacturer should be consulted on proper sealant selection, preparation, and installation procedures.

- material deterioration at or near the foundation, including loss of mortar in masonry, rotting wood clapboards, or settlement cracks in the lower sections of wall;
- evidence of animal or pest infestation;
- vegetation growing close to the foundation, including trees, shrubs and planting beds;
- evidence of moisture damage from lawn and garden in-ground sprinkler systems;
- evidence of moss or mold from damp conditions or poorly situated downsput splash blocks (Fig. 16); and
- blocked downsput drainage boots or clogged areaway grates.

Maintenance:

- Remove leaves and other debris from drains to prevent accumulation. Deach drain grates from paved areas and extract clogged debris. Flush with a hose to ensure that there is no blockage. Use a professional drain service to clear obstructions if necessary.
- Conduct annual termite inspections. Promptly address termite and other insect infestations. Use only licensed company for treatment where needed.
- Keep the grade around the foundation sloping away from the building. Add soil to fill depressions particularly around downsputs and splash blocks. Make sure that soil does not come too close to wooden or metal elements. A 6" separation between wooden siding and the grade is usually recommended.
- Avoid use of mulching material immediately around foundations as such material may promote termite infestation, retain moisture or change existing grade slope.
- Reset splash blocks at the end of downsput or add extender tubes to the end of downsputs as necessary (Fig. 17).
- Lubricate operable foundation vent grilles to facilitate seasonal use: paint as needed.
- Manage vegetation around foundations to allow sufficient air movement for wall surfaces to dry out during damp periods. Trim plantings and remove weeds and climbing vine roots. Be careful not to scar foundations or porch piers with grass or weed cutting equipment. If tree roots appear to be damaging a foundation wall, consult an engineer as well as a tree company.
Wash off discoloration on foundations caused by splashback, algae, or mildew. Use plain water and a soft natural or nylon bristle brush. Unless thoroughly researched and tested beforehand on a discreet area of the wall, avoid chemical products that may discolor certain types of stone. If cleaning products are used, test beforehand in a discreet area, and avoid overspray to plantings and adjacent building materials.

Selectively repoint unit masonry as needed. Follow guidance under the wall sections in regard to compatible mix, appearance, and texture for pointing mortar.

Avoid using salts for de-icing and fertilizers with a high acid or petro-chemical content around foundations, as these materials can cause salt contamination of masonry. Use sand or organic materials without chloride additives that can damage masonry. Where salt is used on icy walks, distribute it sparingly and sweep up residual salt after walks have dried.

Use snow shovels and brooms to clear snow from historic paths and walkways. Avoid blade-type snow removers as they may chip or abrade cobblestones, brick, or stone paving. Note that use of steel snow removal tools in areas where salt-containing snow melters are used may result in rust staining from steel fragments left on the paving.

**Conclusion**

Maintenance is the most important preservation treatment for extending the life of a historic property. It is also the most cost effective. Understanding the construction techniques of the original builders and the performance qualities of older building materials, using traditional maintenance and repair methods, and selecting in-kind materials where replacements are needed will help preserve the building and its historic character.

Maintenance can be managed in small distinct components, coordinated with other work, and scheduled over many years to ensure that materials are properly cared for and their life span maximized. A written maintenance plan is the most effective way to organize, schedule, and guide the work necessary to properly care for a historic building. The maintenance plan should include a description of the materials and methods required for each task, as well as a schedule for work required for maintenance of different building materials and components.

Historic house journals, maintenance guides for older buildings, preservation consultants, and preservation maintenance firms can assist with writing appropriate procedures for specific properties. Priorities should be established for intervening when unexpected damage occurs such as from broken water pipes or high winds.

**Endnotes**


Further Reading


Acknowledgements

Sharon C. Park, FAIA, is the former Chief of Technical Preservation Services, Heritage Preservation Services, National Park Service, in Washington, D.C. and is currently the Associate Director for Architectural History and Historic Preservation, Smithsonian Institution.

The author wishes to thank Mike Selbert of the National Park Service for research on the project and the development of the charts; and Laura Burger, AIA, of the firm of Chambers, Murphy & Burger, and Michael Emerick, AIA, for sharing their expertise on maintenance and providing early guidance. Thanks go to Deborah Slaton of the firm of Wiss, Janney, Elstner Associates, Inc., for her insightful contributions and also to Rebecca Stevens of the National Park Service, Dominique Hawkins, AIA, of Preservation Design Partnership, J. Bryan Blundell of Dell Corporation, and Michael Scheffler and Kenneth Ile of Wiss, Janney, Elstner Associates, Inc. Also, gratefully acknowledge for their assistance in the technical review and editing of this publication are Charles E. Fisher, Anne E. Grimmer, and Chad Randl of the National Park Service’s Technical Preservation Services, and former staff Ray D. Weeks. Numerous other National Park Service staff and partners commented on the manuscript and made substantial contributions.

This publication has been prepared pursuant to the National Historic Preservation Act, as amended, which directs the Secretary of the Interior to develop and make available information concerning historic properties. Comments about this publication should be made to: Charles Fisher, Technical Publications Program Manager, Technical Preservation Services, 1849 C Street, NW, Washington, D.C. 20006. Additional information offered by Technical Preservation Services is available on our website at <www.nps.gov/history/tps/>. This publication is not copyrighted and can be reproduced without penalty. Normal procedures for credit to the author and the National Park Service are appreciated. Unless otherwise noted, photographs in this Brief are by Sharon C. Park, FAIA. Except for the author’s photos, the photographs used in this publication may not be used to illustrate other publications without permission of the owner.
Appendix D
2007 CAP Site Questionnaire
General Information

Organization: ____
Mailing address: ____
City: ____ State: ____ Zip: ____
Web address: ____
Location address: ____
City: ____ State: ____ Zip: ____

Project Contact: ☐ Mr. ☐ Ms. ☐ Dr.
Name: ____ Title: ____
Phone: ____ Fax: ____
If seasonal organization, provide an off-season number: ____
E-mail: ____
Mailing Address (if different from institution address): ____

Collections Assessor
Name: ____
Phone: ____ Fax: ____
E-mail: ____

Architectural Assessor/Living Collections Assessor (if applicable)
Name: ____
Phone: ____ Fax: ____
E-mail: ____

Governing control:
☐ state ☐ county ☐ municipal
☐ private non-Profit ☐ tribal government ☐ other ____

Is the applicant organization university controlled? ☐ yes ☐ no

If a board governs your organization, how many members are on the board? ____
What is their term of service? ____
Type of organization (check one):

☐ aquarium
☐ arboretum/botanic garden
☐ art museum
☐ children’s/youth museum
☐ general museum*  ☐ nature center
☐ planetarium
☐ science/technology museum
☐ specialized museum**
☐ historic house/site
☐ zoo

* A museum with collections representing two or more disciplines equally (e.g., art and history).

** A museum with collections limited to one narrowly defined discipline (e.g., textiles, stamps, maritime, ethnic group).

Annual operating budget for most recently completed fiscal year:

FY _____ $ _____

Are funds regularly expended on the preservation of collections? ☐ yes ☐ no ☐ don’t know

If yes, approximately how much is expended annually on the preservation of collections?
(include costs for supplies, equipments, surveys, treatment, preservation reformatting, commercial
binding, consultants/contractors, etc.) $ _____

If yes, are these funds a regular line-item of the institutional budget? ☐ yes ☐ no ☐ don’t know

Are funds regularly expended on the preservation of the building? ☐ yes ☐ no ☐ don’t know

If yes, approximately how much is expended annually on the preservation of the
building? $ _____

If yes, are these funds a regular line-item of the institutional budget? ☐ yes ☐ no ☐ don’t know

Year the museum was first open and exhibiting to the public: _____

Museum’s open hours: _____

Mission statement

Include the museum’s mission statement or description of museum’s purpose below with the date of approval by the Board of Directors. If you need more space, you may attach a copy.

_____
Goals and previous assessments

What goals does the institution have for this survey? (check all that apply, and elaborate if there are areas of special concern)

- [ ] develop a long-range preservation plan for collections
- [ ] improve collections care
- [ ] improve the preservation of the building
- [ ] improve environmental conditions
- [ ] increase staff awareness of collections preservation concerns
- [ ] other: ____

Comments/special concerns: ____

On a scale of 1-10 (1=low, 10=high), rate collections care as a priority of your institution: ____

If your museum has received the following, indicate which year(s):

- Conservation Project Support Grant  Year(s) ____
- Conservation Assessment Program (CAP)  Year ____
- Museum Assessment Program (MAP)  Collections  Governance
  Institutional  Public Dimension ____

Staff

Include both paid and non-paid (volunteer) staff below. (attach an extra page, if needed)

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Work with Collections</th>
<th>Full Time</th>
<th>Part Time</th>
<th>Paid</th>
<th>Volunteer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

Which person is primarily responsible for collections care and preservation? ____

Does this person’s job description reflect these activities? [ ] yes  [ ] no
General Information

Is there a conservator on staff? □ yes □ no

Does the institution obtain conservation services on a contractual basis? □ yes □ no

Who has responsibility for each of the following activities (e.g., title of staff member, outside service, etc.)?

- Preparing collections for exhibit or loan
- Preparing collections for research and storage
- Cleaning and repairing collection material
- Labeling/marking objects
- Packing and unpacking objects
- Building maintenance

Indicate whether formal orientation or training is provided for staff (paid and unpaid) in the following areas:

- Collection preservation activities □ yes □ no □ don’t know
- Handling objects □ yes □ no □ don’t know
- Labeling/marking objects □ yes □ no □ don’t know
- Packing/unpacking techniques □ yes □ no □ don’t know
- Building maintenance and repair □ yes □ no □ don’t know
- General housekeeping and cleaning □ yes □ no □ don’t know

Who provides the orientation/training? __________

Buildings

How many buildings does the institution occupy? __________

- Are they all on the same site? □ yes □ no
- If no, where are the buildings located? __________

How many sites does the institution maintain? __________

Does the institution own the building(s) or site(s) in which its collections are housed? □ yes □ no

- If no, explain: __________

2007 CAP Site Questionnaire
Museum Sites (photocopy this section and complete for each museum site)

Site area: □ <1 acre □ 1.1 acre - 5 acres □ 5.1 acres - 10 acres □ >10.1 acres
Location type: □ urban □ suburban □ rural

Local Climate
Obtain local weather bureau statistics before the assessment and have them available at your site. Copies should be available at the local airport.

Air Quality
Obtain statistics about local air quality before the assessment and have them available at your site. Copies should be available at the local office of environmental control.

Has a Historic Landscape Report been completed? □ yes □ no
Is the site a National Historic Landmark? □ yes □ no

Indicate items that have required maintenance or repair by either in-house employees or contractors during the last three to five years:

<table>
<thead>
<tr>
<th>Site</th>
<th>Employees</th>
<th>Contractors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maintenance</td>
<td>Repair</td>
</tr>
<tr>
<td>lawns</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>gardens</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>snow removal</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>walks</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>drives</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>parking lots</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>steps</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>fences</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>railings</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>yard drains</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>areaways</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>trash removal</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>other:</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
Structures (Photocopy pages 12-17 of this section and complete for each structure, including storage areas.)

Note: If the facility consists of additions that function independently or in a significantly different manner from the primary structure, or if the construction, use, or climate control systems are different, complete the following section for each addition. An architect will be assigned to structures more than 50 years old.

Name of structure: 

Owner: 

Original use of structure: 

Current use of structure: 

Address if different from museum address: 

Size of structure:  

Type of structure:  

- modern building built as a museum
- older building built as a museum
- older or historic structure not originally designed as a museum
- building shared with other non-museum activities
- other:  

Has the institution ever engaged a consultant to survey all or part of the building?  

- yes  
- no  

If yes, elaborate briefly:  

Has a Historic Structures Report been completed? 

- yes  
- no  

If yes, date: 

Is the building listed on the National Register of Historic Places?  

- yes  
- no  

Is any other historic documentation for the building available?  

- yes  
- no  

If yes, list and indicate where these documents are available: 

Building statistics:  

- Approximate area of original construction:  
- Number of stories:  
- Footprint (ground area occupied by a building):  

Construction date:  

- 17th century
- 18th century
- 1800-1850
- 1851-1875
- 1876-1900
- 1901-1925
- 1926-1956

If addition(s), construction dates:  

- 17th century
- 18th century
- 1800-1850
- 1851-1875
- 1876-1900
- 1901-1925
- other:  
Approximate area of each addition:

<table>
<thead>
<tr>
<th>Year</th>
<th>Sq. Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Approximate square foot area of functions:

<table>
<thead>
<tr>
<th>Function</th>
<th>Sq. Ft.</th>
<th>n/a</th>
</tr>
</thead>
<tbody>
<tr>
<td>exhibitions:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>offices:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>collection storage:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>exhibition/collection preparation:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>education functions:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>corridors and stairs:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>building services:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>food preparation and consumption:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>other:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total usable floor space:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Construction type (check all that apply)

<table>
<thead>
<tr>
<th>Exterior walls:</th>
<th>wood</th>
<th>brick</th>
<th>stone</th>
<th>metal</th>
<th>other:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basement walls:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>n/a</td>
</tr>
<tr>
<td>Finished walls:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basement floor:</td>
<td>earth</td>
<td>brick</td>
<td>wood</td>
<td>concrete</td>
<td>n/a</td>
</tr>
<tr>
<td>Main floor:</td>
<td>steel</td>
<td>wood</td>
<td>concrete</td>
<td>other:</td>
<td></td>
</tr>
<tr>
<td>Other floor:</td>
<td>steel</td>
<td>wood</td>
<td>concrete</td>
<td>other:</td>
<td></td>
</tr>
<tr>
<td>Attic floor:</td>
<td>steel</td>
<td>wood</td>
<td>concrete</td>
<td>other:</td>
<td></td>
</tr>
<tr>
<td>Roof covering:</td>
<td>wood</td>
<td>slate</td>
<td>tile</td>
<td>metal</td>
<td>tar</td>
</tr>
<tr>
<td>Roof rafters:</td>
<td>wood</td>
<td>steel</td>
<td>flat roof</td>
<td>sloping roof</td>
<td></td>
</tr>
<tr>
<td>Window sash:</td>
<td>wood</td>
<td>metal</td>
<td>basement</td>
<td>double hung</td>
<td></td>
</tr>
</tbody>
</table>

Structures
Indicate items that have required maintenance or repair by either in-house employees or contractors during the last three to five years:

<table>
<thead>
<tr>
<th>Employees</th>
<th>Contractors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance</td>
<td>Repair</td>
</tr>
<tr>
<td>Exterior Building</td>
<td></td>
</tr>
<tr>
<td>Windows</td>
<td></td>
</tr>
<tr>
<td>Doors</td>
<td></td>
</tr>
<tr>
<td>Gutter, downspouts</td>
<td></td>
</tr>
<tr>
<td>Water hydrants</td>
<td></td>
</tr>
<tr>
<td>Exterior painting</td>
<td></td>
</tr>
<tr>
<td>Roofs</td>
<td></td>
</tr>
<tr>
<td>Chimneys</td>
<td></td>
</tr>
<tr>
<td>Skylights</td>
<td></td>
</tr>
<tr>
<td>Walls</td>
<td></td>
</tr>
<tr>
<td>Masonry cracks</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Interior Building</td>
<td></td>
</tr>
<tr>
<td>Water damage</td>
<td></td>
</tr>
<tr>
<td>Termites</td>
<td></td>
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<tr>
<td>Floors</td>
<td></td>
</tr>
<tr>
<td>Windows</td>
<td></td>
</tr>
<tr>
<td>Stairs</td>
<td></td>
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<tr>
<td>Plaster cracks</td>
<td></td>
</tr>
<tr>
<td>Painting</td>
<td></td>
</tr>
<tr>
<td>Fireplaces &amp; flues</td>
<td></td>
</tr>
<tr>
<td>Roof leaks</td>
<td></td>
</tr>
<tr>
<td>Electrical system</td>
<td></td>
</tr>
<tr>
<td>Lighting fixtures</td>
<td></td>
</tr>
<tr>
<td>Plumbing system</td>
<td></td>
</tr>
<tr>
<td>Heating system</td>
<td></td>
</tr>
<tr>
<td>Air conditioning</td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
</tr>
</tbody>
</table>

Was insulation installed during the past three to five years? □ yes □ no

Is there a history of recurring problems in the building? (check all that apply)

- □ basement flooding
- □ wall condensation
- □ electrical
- □ wet basement
- □ window/ plumbing leaks
- □ mildew
- □ stained walls
- □ blown fuses
- □ window condensation
- □ roof leaks
- □ structural-exterior
- □ pests
- □ cold water pipe
- □ stained ceilings
- □ structural-interior
- □ other: ___
Are special events permitted anywhere in the building? 

- [ ] Yes
- [x] No

If yes, where? _____

Does the structure have any special facilities? 

- [ ] Yes
- [ ] No

If yes, please indicate:

- [ ] Aquaria and ponds
- [ ] Photographic laboratories
- [ ] Insect zoo
- [ ] Conservation laboratories
- [ ] Preparation laboratories
- [ ] Live animal facilities
- [ ] Dermestid chamber
- [ ] Fumigation chamber
- [ ] Receiving/packing area for collections
- [ ] Other: _____

**Climate Control and Environment**

In what areas of the building are environmental conditions monitored?

- [ ] All areas with collections (exhibits, storage, etc.)
- [ ] Some areas with collections, but not all
- [ ] No areas
- [ ] Don’t know

Who is responsible for monitoring environmental conditions? _____

What type of environmental monitoring equipment do you have? (Check all that apply):

- [ ] Sling psychrometer
- [ ] Thermometers
- [ ] Hygrometers
- [ ] Recording hygrothermographs
- [ ] Thermo-hygrometers
- [ ] Data loggers
- [ ] Battery operated psychrometer
- [ ] None
- [ ] Other: _____

Is monitoring equipment calibrated on a regular basis? 

- [ ] Yes
- [ ] No

Does the structure have a central heating, ventilating, and air conditioning (HVAC) system? 

- [ ] Yes
- [ ] No

If yes, answer questions below; if no, answer questions for structures without HVAC below.

*For structures with central HVAC*

- [ ] Are all spaces included in the central HVAC system? 
  - [ ] Yes
  - [ ] No

  If no, specify which areas are not included: _____

- [ ] Are there separate temperature zones within the centralized system? 
  - [ ] Yes
  - [ ] No

  If yes, can temperature in those zones be adjusted by individual users? 
  - [ ] Yes
  - [ ] No

- [ ] Are there separate humidity zones within the centralized system? 
  - [ ] Yes
  - [ ] No

- [ ] Do you think the system is working properly? 
  - [ ] Yes
  - [ ] No

- [ ] Do you use supplemental environmental control equipment in areas covered by the system? 
  - [ ] Yes
  - [ ] No

  If yes, check all that you use:
  - [ ] Fan
  - [ ] Portable dehumidifier
  - [ ] Portable humidifier
  - [ ] Heater
  - [ ] Window air conditioner
  - [ ] Other: _____

- [ ] Do you open doors and/or windows to control temperature and provide ventilation? 
  - [ ] Yes
  - [ ] No

- [ ] Do you lower the HVAC levels each evening? 
  - [ ] Yes
  - [ ] No
For structures without a central HVAC system

Are any of the following centralized?  
- heat: □ yes □ no
- cooling: □ yes □ no

Do you use local climate control equipment: □ yes □ no
If yes, check all you use:
- fan
- window air conditioner
- portable humidifier
- portable dehumidifier
- other: _____

Do you open doors and/or windows to control temperature and provide ventilation? □ yes □ no

Pollutants and Particulates
If your building has a central HVAC system, is the air filtered for: □ dust □ gaseous pollutants
If there is no central HVAC system or if the air is not filtered for dust and gaseous pollutants, do you take any precautions to protect your collections against these problems: □ yes □ no
If yes, how: _____

Is smoking allowed in the building? □ yes □ no
If yes, where? _____

Illumination
Which of the following illuminate exhibition and storage areas? (check all that apply)

<table>
<thead>
<tr>
<th>Light Source</th>
<th>Exhibition</th>
<th>UV filtration</th>
<th>Storage</th>
<th>UV filtration</th>
<th>n/a</th>
</tr>
</thead>
<tbody>
<tr>
<td>natural daylight</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>fluorescent light</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>incandescent light</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>tungsten halogen</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

In what areas of the building are light levels monitored?
- □ all areas with collections (exhibits, storage, etc.)
- □ some areas with collections, but not all
- □ no areas
- □ don't know

Who is responsible for monitoring? _____

Is ultraviolet filtration provided for the following light sources in exhibition and storage areas?

<table>
<thead>
<tr>
<th>Light Source</th>
<th>Exhibition</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>natural daylight</td>
<td>□ yes □ no</td>
<td>□ yes □ no</td>
</tr>
<tr>
<td>fluorescent light</td>
<td>□ yes □ no</td>
<td>□ yes □ no</td>
</tr>
</tbody>
</table>

Who is responsible for monitoring? _____

What light monitoring equipment do you use? (check all apply)
- □ footcandle or lux meter
- □ photo light meter
- □ surface temperature thermometer
- □ ultraviolet (UV meter)
- □ other: _____
When are the lights turned on in the exhibition areas? (check all that apply)

- [ ] During hours museum is open
- [ ] 24 hours a day
- [ ] Only when visitors are present
- [ ] Only when people are present
- [ ] Other: 

Are light levels adjusted in your galleries for the visually impaired?  
- [ ] Yes
- [ ] No

Is photography permitted in exhibition areas?  
- [ ] Yes
- [ ] No

If yes, indicate what type of photography is permitted:  
- [ ] Flash photography
- [ ] Floodlight illuminated photography
- [ ] Film or video recording

Pest Control
Has there ever been a pest problem in your institution?  
- [ ] Yes
- [ ] No

If yes, indicate which pests have been a problem:  
- [ ] Insects
- [ ] Fungi (mold)
- [ ] Rodents
- [ ] Birds
- [ ] Other: 

Where have these problems been known or suspected to occur?  
- [ ] Exhibitions
- [ ] Storage
- [ ] Building structure
- [ ] Other: 

Does your institution have a pest management (prevention and control) program?  
- [ ] Yes
- [ ] No

Are collection areas routinely inspected for pest evidence or activity?  
- [ ] Yes
- [ ] No

Are the collection areas routinely treated with a pesticide?  
- [ ] Yes
- [ ] No

Are collections materials routinely treated with a pesticide?  
- [ ] Yes
- [ ] No

Are live flowers or plants permitted in the building?  
- [ ] Yes
- [ ] No

Is food prepared or consumed in the building?  
- [ ] Yes
- [ ] No

If yes, where? 

2007 CAP Site Questionnaire  17
Supplement for ReCAP Participants

Note: Read the instructions at the front of the Site Questionnaire and complete this supplement if applicable. You may use your ReCAP supplement from the CAP application in place of this page.

Year Received CAP____

Describe what preservation efforts your museum has accomplished since your previous CAP assessment. (Attach additional pages if needed.)

_____ 

Describe your museum’s need for a new assessment (attach additional pages if needed). 

_____ 

2007 CAP Site Questionnaire  25
Appendix C: Conditions Assessment Standards

Below is an excerpt from Best Practices for Conditions Assessments of Historic Structures. This booklet and Best Practices for General Conservation Assessments were created by Heritage Preservation with the help of assessors to share tips, suggestions, and examples to improve CAP assessments. These booklets are available through Heritage Preservation and can be downloaded from the Heritage Preservation Web site at www.heritagepreservation.org/CAP/assessors.html.

The Conditions Assessment Standard definitions below are based on those used by government and private industry.

**Qualitative Condition Ratings**

**Good**—This rating indicates:
(a) routine maintenance should be sufficient to maintain the current condition; and/or
(b) a cyclical maintenance or repair/rehabilitation project is not specifically required to maintain the current condition or correct deficiencies.

**Fair**—This rating indicates:
(a) the feature generally provides an adequate level of service to operations, but
(b) the feature requires more than routine maintenance attention.
(c) Also indicates that cyclical maintenance or repair/rehabilitation work may be required in the future.

**Poor**—This indicates the feature is in need of immediate attention. This rating also indicates that:
(a) routine maintenance is needed at a much higher level of effort to meet significant safety and legal requirements;
(b) cyclical maintenance should be scheduled for the current year and/or
(c) a special repair/rehabilitation project should be requested consistent with park requirements, priorities, and long-term management objectives.

**Maintenance Deficiency Priority Ratings (Five Year Rating Period)**

These priority ratings indicate either a critical, serious, or minor deficiency priority rating and are highlighted in the executive summary.

**Critical (Emergency/Immediate)**—This rating indicates:
• an advanced state of deterioration that has resulted in the failure of a feature or will result in the failure of a feature if not corrected within one year; or
• accelerated deterioration of adjacent or related materials or systems as a result of the feature's deficiencies if not corrected within one year; or
• an immediate threat to the health and/or safety of the user; or
• a failure to meet a legislated requirement.

**Serious (Immediate/Short Term)**—This rating indicates:
• a deteriorated condition that if not corrected within one to three years will result in the failure of the feature; or
• a threat to the health and/or safety of the user may occur within one to three years if the ongoing deterioration is not corrected; or
• ongoing deterioration of adjacent or related materials and/or features as a result of the feature's deficiency.

**Minor (Short-Term/Long-Term)**—This rating indicates:
• standard preventative maintenance practices and preservation methods have not been followed; or
• reduced life expectancy of affected adjacent or related materials and/or systems within three to five years and beyond; or
• a condition with a long-term impact within three to five years.
Appendix F
CAP Architectural Assessment Checklist

The Conservation Assessment: A Tool for Planning, Implementing, and Fund-raising
Conservation Assessment

Architectural Assessment Checklist

The architectural assessment forms have been developed to address the needs of diverse museum collections housed within a wide variety of facilities. Certain questions may not apply to every situation. While many buildings may be able to be assessed in a single day, large and/or complicated structures will require more time.

In order to produce a final report that is responsive to both the collection and the building, the architectural and collection assessors will need to compare notes and exchange information. The final report should be a collaboration which balances the needs of the collection with those of the historic structure.

Diagrammatic plans of the site and each floor level of the building (including basement and attic) should be included with the final report (see samples on pages 47 - 48). Also include outline drawings of building exterior and important interior elevations. Although photographs are an excellent method to record existing conditions, adding notes and comments directly to floor plans and elevation drawings is often a fast and efficient way of noting major problems or complicated conditions that cannot be easily described with words.

These plans are for the purpose of functional analysis and for the development of recommendations of more suitable uses for various museum spaces. These simple drawings should convey only enough detail for a clear understanding of spatial relationships. Professional line drawings are neither required nor must be absolutely accurate; they may be prepared free-hand at a small scale on graph paper. Floor plans should indicate walls, windows, doors, stairs, and overall dimensions only. Identify rooms by a simple letter designation which will correspond with a key of space use developed on a separate sheet.

Photographic documentation of each building inspected should accompany the final report. Photographs should include complete views of each condition and defect being illustrated. Major deficiencies should be recorded. There should also be photographic documentation of typical window and door types. Each photograph should be labelled with the building name, specific subject and the date of recording.
1. General Information

Institution name: ____________________________________________________________
Address: __________________________________________________________________
__________________________________________________________________________
Contact person (include title): _______________________________________________
Other staff contact (include title): ___________________________________________
Local general contractor contact: _____________________________________________
Local HVAC contractor contact: _____________________________________________
Local electric contractor contact: ____________________________________________
Architect/Architectural conservator: _________________________________________
Collections conservator: ___________________________________________________
Survey date: (Make blank copies of this form and complete one for each building containing museum collections.)

2. Structures and Sites (Verify the pre-survey information furnished by the museum)

Source of information relating to structures and sites (i.e., second-hand, etc.):

Site area (square feet or acres): ________________________________________________
Name if unique: __________________________________________________________________
Describe location (central city, urban, suburban, rural): ______________________________________

Building statistics:
Approximate area of original construction: _____________________________ Sq.ft.
Foot Print: Area occupied by building: _____________________________ Sq.ft.
Number of Stories: _____________________________________________

Approximate area of each addition
Addition #: __________ Year built: __________ Sq.ft.: __________
Addition #: __________ Year built: __________ Sq.ft.: __________

Roof Area: ___________________________ Sq.ft.

Directions: Circle the material names. Since there may be more than one material in a building elevation or wall, check as many as applicable. Problem conditions, unusual features and additional information should be noted under Comments and on corresponding floor plans.

2.1 Exterior Wall Construction

EXTERIOR WALLS

North Exterior Wall
Materials: ☐ wood ☐ brick ☐ stone ☐ metal ☐ stucco ☐ paint
Condition: ☐ cracks ☐ open joints ☐ vegetation
Repair: ☐ major ☐ minor
Maintenance: ☐ good ☐ poor
Comments: ____________________________________________________________

East Exterior Wall
Materials: ☐ wood ☐ brick ☐ stone ☐ metal ☐ stucco ☐ paint
Condition: ☐ cracks ☐ open joints ☐ vegetation
Repair: ☐ major ☐ minor
Maintenance: ☐ good ☐ poor
Comments: ____________________________________________________________

2—Architectural Assessment Checklist
South Exterior Wall
Materials:  □ wood  □ brick  □ stone  □ metal  □ stucco  □ paint
Condition:  □ cracks  □ open joints  □ vegetation
Repair:  □ major  □ minor
Maintenance:  □ good  □ poor
Comments: ____________________________________________

West Exterior Wall
Materials:  □ wood  □ brick  □ stone  □ metal  □ stucco  □ paint
Condition:  □ cracks  □ open joints  □ vegetation
Repair:  □ major  □ minor
Maintenance:  □ good  □ poor
Comments: ____________________________________________

Basement Wall Construction
Materials:  □ stone  □ brick  □ wood  □ concrete  □ other__________
Condition:  □ excellent  □ good  □ fair  □ poor
Repair:  □ major  □ minor
Maintenance:  □ good  □ poor
Comments: ____________________________________________

WINDOWS
Directions: Count the total number of windows and determine material(s) and type(s). Note if each floor has a typical window type.
Count:  Number of wooden __________  Number of metal __________
Type:  Number of fixed  __________  Number of double-hung  __________
Condition:
Glazing:  □ single pane  □ insulated  □ good  □ broken
Comments:________________________
Frame/sash:  □ excellent  □ good  □ fair  □ poor
Comments:________________________
Repair:  □ major  □ minor
Maintenance:  □ good  □ poor
Comments: ____________________________________________

2.2 Roof Construction and Other Roof Elements

ROOF DECK CONSTRUCTION
Beams:  □ wood  □ steel  □ concrete
Condition:  □ good  □ poor  □ failed
Insulation:  □ none  □ blown  □ foam  □ blanket  □ rigid
□ vapor barrier  □ attic cold vent  □ other_________
Comments:____________________________________________________________________

ROOF COVERING
Material:  □ wood  □ slate  □ tile  □ asphalt  □ bitumen/stone
□ terra cotta  □ metal  □ other_________
Condition:  □ good  □ poor  □ failed
Comments:____________________________________________________________________

Architectural Assessment Checklist—3
### CHIMNEYS

<table>
<thead>
<tr>
<th>Number:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Material:</td>
<td>brick</td>
</tr>
<tr>
<td></td>
<td>stone</td>
</tr>
<tr>
<td></td>
<td>metal</td>
</tr>
<tr>
<td></td>
<td>other</td>
</tr>
<tr>
<td>Condition:</td>
<td>good</td>
</tr>
<tr>
<td></td>
<td>poor</td>
</tr>
<tr>
<td></td>
<td>failed</td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
</tr>
<tr>
<td>Flashing:</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>lead</td>
</tr>
<tr>
<td></td>
<td>copper</td>
</tr>
<tr>
<td></td>
<td>galvanized</td>
</tr>
<tr>
<td></td>
<td>other</td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
</tr>
</tbody>
</table>

### PARAPETS

| Material:     | brick    |
|               | stone    |
|               | metal    |
|               | other    |
| Height:       |          |
| Condition:    | good     |
|               | poor     |
|               | failed   |
| Comments:     |          |

### COPINGS

| Top material: | brick    |
|               | stone    |
|               | metal    |
|               | tile     |
|               | slate    |
|               | other    |
| Condition:    | good     |
|               | poor     |
|               | failed   |
| Comments:     |          |
| Joint Material: | none   |
|               | caulk    |
|               | mortar   |
|               | other    |
| Condition:    | good     |
|               | poor     |
|               | failed   |
| Comments:     |          |
| Flashing:     | none     |
|               | lead     |
|               | copper   |
|               | galvanized |
|               | other    |
| Comments:     |          |

### DORMERS

<table>
<thead>
<tr>
<th>Number:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Material:</td>
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</tr>
<tr>
<td></td>
<td>stone</td>
</tr>
<tr>
<td></td>
<td>wood</td>
</tr>
<tr>
<td></td>
<td>other</td>
</tr>
<tr>
<td>Condition:</td>
<td>good</td>
</tr>
<tr>
<td></td>
<td>poor</td>
</tr>
<tr>
<td></td>
<td>failed</td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
</tr>
</tbody>
</table>

### SKYLIGHTS

<table>
<thead>
<tr>
<th>Total Number:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Original:</td>
<td></td>
</tr>
<tr>
<td>Replacement:</td>
<td></td>
</tr>
<tr>
<td>Glazing:</td>
<td>plate</td>
</tr>
<tr>
<td></td>
<td>wire</td>
</tr>
<tr>
<td></td>
<td>plexiglas</td>
</tr>
<tr>
<td></td>
<td>stained</td>
</tr>
<tr>
<td>Condition:</td>
<td>good</td>
</tr>
<tr>
<td></td>
<td>broken</td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
</tr>
<tr>
<td>Frame:</td>
<td>metal</td>
</tr>
<tr>
<td></td>
<td>wood</td>
</tr>
<tr>
<td></td>
<td>other</td>
</tr>
<tr>
<td>Condition:</td>
<td>good</td>
</tr>
<tr>
<td></td>
<td>poor</td>
</tr>
<tr>
<td></td>
<td>failed</td>
</tr>
<tr>
<td>Comments:</td>
<td></td>
</tr>
</tbody>
</table>

### CORNICE AND ROOF SOFFITS

| Material:     | wood     |
|               | metal    |
|               | other    |
| Height:       |          |
| Condition:    | good     |
|               | poor     |
|               | failed   |
| Comments:     |          |

### RAINWATER SYSTEM

<table>
<thead>
<tr>
<th>Location:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Material:</td>
<td>interior</td>
</tr>
<tr>
<td></td>
<td>exterior</td>
</tr>
<tr>
<td></td>
<td>aluminum</td>
</tr>
<tr>
<td></td>
<td>copper</td>
</tr>
<tr>
<td></td>
<td>galvanized iron</td>
</tr>
<tr>
<td></td>
<td>other</td>
</tr>
</tbody>
</table>

---

4—Architectural Assessment Checklist  

186
Gutter
Condition: ☐ good ☐ poor ☐ failed
Comments:

Downspout
Condition: ☐ good ☐ poor ☐ failed
Comments:

2.3 Construction By Floor Level
Make a copy of this page for each floor of the building.
Floor Level ________________________________
(basement, first, second, third, fourth, fifth, attic)

FLOOR CONSTRUCTION (SUPPORTING STRUCTURE)
Materials ☐ earth ☐ brick ☐ wood frame ☐ steel girders and beams ☐ other _________
☐ reinforced concrete ☐ steel girders and beams ☐ other _________
Condition ☐ excellent ☐ good ☐ fair ☐ poor
Repair ☐ major ☐ minor
Maintenance ☐ good ☐ poor
Comments:

FLOOR FINISH
Materials ☐ none ☐ paint ☐ wood ☐ resilient ☐ carpet ☐ ceramic
☐ stone ☐ other _________
Condition ☐ excellent ☐ good ☐ fair ☐ poor
Repair ☐ major ☐ minor
Maintenance ☐ good ☐ poor
Comments:

INTERIOR WALL CONSTRUCTION
Materials ☐ brick ☐ concrete ☐ stone ☐ wood frame ☐ metal frame
Condition ☐ excellent ☐ good ☐ fair ☐ poor
Repair ☐ major ☐ minor
Maintenance ☐ good ☐ poor
Comments:

INTERIOR WALL FINISHES
Material ☐ wood ☐ drywall ☐ plaster ☐ brick ☐ tile ☐ wallpaper
☐ paint ☐ other _________
Condition ☐ excellent ☐ good ☐ fair ☐ poor
Repair ☐ major ☐ minor
Maintenance ☐ good ☐ poor
Comments:

CEILING FINISH
Material ☐ wood ☐ drywall ☐ plastic ☐ acoustical tile
☐ paint ☐ suspended ☐ other _________
Condition ☐ excellent ☐ good ☐ fair ☐ poor
Repair ☐ major ☐ minor
Maintenance ☐ good ☐ poor
Comments:
TRIM
Material: □ wood □ stone □ tile □ paint □ stain □ natural
Condition: □ excellent □ good □ fair □ poor
Repair: □ major □ minor
Maintenance: □ good □ poor □ failed
Comments:

FIREPLACES/STOVES
Total Number: __________________________
Number in use: __________________________
Number covered over: __________________________
Material: □ brick □ stone □ metal □ other
Condition: □ good □ poor □ failed
Comments:

2.4 Plumbing System
Water source: □ city utility □ well
Distribution piping: □ galvanized □ plastic □ copper □ lead □ other__________
Cold water pipe Insulation: □ yes □ no
Waste piping: □ plastic □ copper □ cast iron □ other__________
Water heater fuel: □ gas □ oil □ electric
Water heater age: ________ years
Sewer: □ city utility □ septic system

2.5 HVAC System
DUCTED AIR SYSTEM □ yes □ no
if yes: □ gas □ oil □ electric
Used for □ heating □ cooling
Air movement: □ gravity □ blower □ not applicable
Duct material: □ galvanized □ sheet metal fiberglass □ other__________
Duct insulation: □ yes □ no
With cooling coil □ yes □ no
Thermostat location: __________________________
Filters location: __________________________
Filter type: __________________________
Filter age: ________ years
Register locations □ floor □ high wall [yes or no] □ low wall □ ceiling

HOT WATER HEATING: □ yes □ no
Boiler: □ gravity □ hydraulic pump
□ cast iron □ steel
Age of boiler: ________ years
Distribution piping: □ galvanized □ copper □ other__________
Radiation: □ radiators □ fin tube
Age: ________ years
### STEAM HEATING
- **Yes** ☐
- **No** ☐
- **Age:** _______ years
- **Boiler:**
  - **Cast iron** ☐
  - **Steel** ☐
- **Distribution piping:**
  - **Galvanized** ☐
  - **Copper** ☐
  - **Other** ☐
- **Insulation:**
  - **Yes** ☐
  - **No** ☐
- **Radiation:**
  - **Radiators** ☐
  - **Connectors** ☐

### ELECTRICAL RESISTANCE HEATING
- **Yes** ☐
- **No** ☐
- **Age:** _______ years
- **Radiation:**
  - **Wall heater** ☐
  - **Radiant wall** ☐
  - **Radiant ceiling** ☐

### AIR-CONDITIONING SYSTEM
- **Yes** ☐
- **No** ☐
- **Type:**
  - **All components in one unit** ☐
  - **None** ☐
- **Evaporator location:**
  - **At heating unit** ☐
  - **Other:** ☐
- **Compressor age:** _______ years
- **Cooling tower:**
  - **Yes** ☐
  - **No** ☐
- **Condenser line location:**
- **Refrigerant lines:**
  - **Yes** ☐
  - **No** ☐
- **Is one insulated?**
  - **Yes** ☐
  - **No** ☐
- **Chilled water distribution?**
  - **Yes** ☐
  - **No** ☐

### HUMIDIFIERS
- **Yes** ☐
- **No** ☐
- **Type:**
  - **Stationary pad** ☐
  - **Revolving drum** ☐
  - **Atomizer** ☐
  - **Other** ☐
- **Age:** _______ years
- **If atomizer, is humidity:**
  - **Medium (water)** ☐
  - **Hot (steam)** ☐

### 2.6 Electrical System
- **Service Type:**
  - **Overhead** ☐
  - **Underground** ☐
- **Ampage rating on:**
  - **Panel box** ☐
  - ** Disconnect switches** ☐
- **Overload protection:**
  - **Fuse** ☐
  - **Circuit breaker** ☐
- **Branch circuits:**
  - **Open wires in wood molding** ☐
  - **Knob and tube** ☐
  - **Non-metallic cable/romex** ☐
  - **Metal conduit** ☐
  - **Other** ☐
- **Wire type:**
  - **Copper** ☐
  - **Aluminum** ☐
- **If knob & tube, condition of insulation:**
  - **Good** ☐
  - **Poor** ☐
  - **Failed** ☐
3. Drawings

3.1 Site Plan. Note the following on the site plan:

- North arrow
- Drainage direction
- Utility lines
- Fences and walls
- Number of stories for each section of the building
- Show photograph location arrow
- Sidewalks and driveways
- Electric
- Gas
- Water

Legend:
- Scale: 1 square = 10 ft.
- E: electric
- G: gas
- W: water
3.2 Basement Plan: Note the following on the basement plan (show photograph location arrow):
- Exterior doors and windows
- Floor to floor heights
- Drawing scale
- North arrow

3.3 Floor Plan: Use separate sheets for each level of the facility.
Note the following on each floor plan:
- North arrow
- Exterior dimensions
- Number of stories in each section of the building
Appendix G
Conservation Assessment Guidelines
Getty Conservation Institute, 1999.
II. CONSERVATION ASSESSMENT GUIDELINES

Preparing for a conservation assessment

It is essential that the assessors have as much background information on the museum, the climate in which it is located, its buildings and collections prior to the assessment visit. By obtaining as much of this information as possible beforehand, the assessors be better prepared for a more comprehensive examination and analysis of potential key areas when on-site.

It is therefore recommended that the following information, wherever it exists, be compiled and submitted to the assessors prior to the assessment:

- Institutional background statement (see below)
- Floor plans and sections for each structure
- Information on the site and surroundings (topography, gardens, adjacent traffic areas)
- Local weather bureau statistics
- Local air quality statistics
- Collections management policy
- Pest management policy
- Environmental monitoring data
- Loan policies/contract
- Guidelines for handling, storing and exhibiting the collections
- Guidelines pertaining to the storage of collections and/or use of storage areas
- Guidelines for photographing collections
- Lighting specifications for different types of materials
- Guidelines for packing or unpacking objects
- Guidelines for cleaning or repairing collection materials
- Guidelines for labeling objects
- Emergency preparedness plan
- Guidelines for dealing with vandalism
- Copies of period photographs of the building
- Building maintenance records
- Original building construction documents
- Documents reflecting alterations to the structure
INSTITUTIONAL BACKGROUND

Note: This information sheet should be submitted by the museum to the assessors prior to the assessment visit. This information sheet should accompany the information listed under Preparing for a conservation assessment.

Name of institution/ museum:
Address:
Phone:
Fax:
E-mail address:
Contact person:

Type of institution:
Museum
Historic house
Library/ Archive
Historic/ archaeological site
Other

Date of establishment of institution:

Governance (i.e., owner of institution and collections):

• Non-governmental non-profit organization: public/ private
• National government
• State/ county/ provincial government
• Municipal government
• University
• Religious organization
• Other

If governmental, please indicate the office/ ministry/ agency responsible for the institution:

Institution's mission or purpose:

Does the institutional mission include collection conservation?

Does the institution have any special concerns with respect to the assessment and its outcome?

Name of museum director

Names, titles of museum staff who will participate in/ contribute to the assessment
THE MACRO-ENVIRONMENT OF THE MUSEUM

CLIMATE CHARACTERIZATIONS
Climate is perhaps the largest, and least controllable, influence on the museum. Climate patterns and changes may also provide opportunities to improve the interior environment. In any event, the typical climate patterns should be well understood.

Temperature
High average temperature limits opportunities for cooling. High temperature implies potential for visitor physiological stress. Small annual drift and small diurnal change limit opportunities for seasonal or daily cooling cycles.

What is the mean annual temperature?
What is the ΔT of monthly temperature averages?
What is the ΔT diurnal?
What is the T maximum?

Relative humidity
High relative humidity limits opportunities for drying and increases chances of mold growth, insect attack and corrosion of metals.

What is the typical relative humidity level?
What is the typical relative humidity range?
How does relative humidity vary? Daily? Seasonally?

Precipitation
Patterns of precipitation are important to understanding relative humidity levels and for developing strategies in source moisture control.

What is the precipitation frequency? Annual (mean / maximum)? Weekly? Daily?
What is the intensity of precipitation? Light shower of moderate duration? Intense cloudburst?
Is precipitation accompanied by winds? Does wind-driven rain enter wall openings?

Wind and air movement
Patterns of wind and air movement are important to strategies for natural ventilation and cooling.

Describe wind pattern. Sea breeze? Trade wind?
Dry? Cool? Hot? Fog?


**Solar radiation**
*Patterns of solar radiation and cloud cover affect the intensity of natural light in the interior as well as heat gain and loss and temperature.*


**Air Quality**
*Air quality is a critical consideration if implementing ventilation strategies, especially where mechanical filtration is not practical.*

**Particulates:**
What is the source of particulates? Urban particulates - traffic dust, smoke, soot?
Agriculture dust and smoke?

Does intensity vary by time of day or year?
Are particulates reactive?

**Gaseous Pollutants:**
What is the source? Industrial and vehicular exhaust gases?

Does intensity vary by time of day or year?

**Air-borne insects (all stages of development):**
Describe species, frequency, intensity. Seasonal variations.

**Vegetation & landscaping near building**
*Vegetation & landscaping have important beneficial and adverse implications with respect to interior environment and collections risk. Vegetation & landscaping may facilitate natural filtration of pollutants, provide shading of solar radiation, affect ventilation and wind speeds, retard drying and removal of moisture, elevate local moisture levels, and may facilitate insects and microorganisms if allowed to decay. Landscape maintenance may introduce moisture from irrigation or pollutants and debris from cutting and gasoline powered equipment.*

**Vegetation & landscaping:**
Describe the landscape and vegetation. High canopy, open understory? Dense, building height foliage, close to walls? Grasses?
Describe plant species.
Do plants produce fruit, nuts or flowers, vegetative litter & debris? Are they attractive to insects?
Do plants and plant litter facilitate propagation of microorganisms, mold, mildew?
**Surrounding Construction**
The context of the museum building may significantly affect the interior environment of the museum. Buildings and pavements may impede ventilation, increase rain runoff or retard surface water removal, reflect light toward the building, retain heat, or elevate local temperatures. Parking lots or adjacent buildings with certain uses may increase local vehicular traffic and hence the amount of vibration and of pollution, especially from idling engines.

**Adjacent buildings:**
Describe proximity and nature. Distance? Height? Dark colored? Reflective glass?

Describe use and occupancy. Intensity? Benign or hazardous? Vehicular or pedestrian dependent?

Describe influence on the museum and its environment.

**Pavements:**
Describe proximity, extent and type. Pervious or impervious? Well drained away from building?

Describe parking lots near building and proximity to ventilation openings. Do busses use parking lot? Are busses and taxis permitted to idle engines while waiting for tours or fares?

Describe influence on the museum and its environment of parking areas and neighboring roads. Indicate type of traffic and volume.

**Water sources:**

**Historic context:**
Is the museum located in a historic center, rural setting or a protected area? If yes, describe the main planning or governmental restrictions for this area and especially for the museum building.

Identify landmarks, surrounding main routes and conservation priorities for this context.
THE MUSEUM BUILDING: Characterizations

**Thermal Performance and Response**
The thermal performance and response of the building greatly influence the interior temperature, and thus both collections conservation and physiological comfort of museum staff and visitors. The thermal performance of the building may lead to strategies for interior temperature management, such as night-time cooling by re-radiation.

**Temperature response:**
Do the interior air and building surface temperatures closely follow changes in exterior air temperature, or is there a substantial time delay (such as 6 to 12 hours) between interior and exterior temperature peaks?

Is the peak interior air temperature significantly higher or lower than the peak exterior air temperature, or are the two peaks approximately the same?

What is the range of interior temperatures?

**Thermal characteristics of construction:**
Is the building wall construction massive, such as thick masonry walls, or lightweight, such as wood framing and wood cladding? Indicate materials used in the construction.

Is the building roof construction massive, such as clay tile, or lightweight, such as wood framing and metal sheet? Indicate the materials used in the roofing.

Are exterior walls shaded from solar radiation by vegetation? Trees? Overhanging eaves or porches?

Are exterior walls light or dark colored? What materials are used in the surface treatment?

Is the roof shaded from solar radiation by trees?

Is the roof light or dark colored?

Is the underside of the roof construction exposed to an occupied interior space or separated by an under-roof cavity formed by a separate ceiling construction? Is the under-roof cavity ventilated/insulated?

Are most of the walls exterior walls?

How much glass is used on exterior walls or in roofs?

What are the dimensions of windows?

What is the height/volumes of interior spaces?
Moisture
Although exterior ambient relative humidity may be characteristically high, moisture management at the level of the building is an important strategy for managing interior relative humidity levels.

Exterior source moisture control - roofs:
Does the roof leak? Is it well maintained? Is it easily accessible for maintenance?

Is the roof constructed of, or clad with, materials that are pervious to moisture?

Are roof coatings and membranes well maintained?

Is the roof well drained? Does ponding occur?

Are roof penetrations or appurtenances such as bell towers or chimneys raintight?

Do roof cladding or membrane coverings remain secure and water-tight in wind-driven rain?

Is roof rainwater collected and conducted away from the building by gutters and downspouts? Are the gutters and downspouts of adequate size for the intensity of rainfall and the size of the roof? Do the gutters and downspouts leak? Are gutters and downspouts maintained clear of vegetative litter and other blockages?

Have all potential paths of exterior water entry been accounted for?

Exterior source moisture control - walls:
Are there open cracks, fissures or other opportunities for moisture penetration through the walls?

Are the wall constructed of materials that are pervious to moisture? Are wall coatings, paints, and renderings well maintained?

If roof rainwater is not collected by gutters, are the exterior walls protected by roof overhangs?

Are wall openings protected from wind-driven rain entry by closures such as windows, doors or shutters or by overhangs?

Is collected or uncollected rainwater drained away from the building at grade, or is there surface ponding of water near the walls?

Are there indications of rising damp in the walls? Water entry through subgrade walls?

Have all potential paths of exterior water entry been accounted for?

Are wall opening closures remain secure and water-tight against wind-driven rain?
**Interior source moisture control - occupancy:**

Are there sources of interior moisture such as active water wells or cisterns? How is the floor made? Are there bare earth floors or under-floor cavities? Interior fountains or basins?

Are there functional spaces for activities that release water or water vapor to the interior, such as kitchens and restrooms? Are the rooms serving these activities equipped with windows and/or exhaust fans vented to the exterior?

Are there housekeeping activities, such as wet-mopping floors, which may release moisture to the interior?

Are there leaks in interior systems and piping which may release moisture to the interior?

Have all potential sources of interior moisture been accounted for?

**Symptomatic evidence of moisture problems:**

Is there evidence of paint or rendering failure on building surfaces? Are there rust stains or signs of corrosion? Is exterior wood decayed?

Are there accumulations of mold or mildew on building surfaces?

Is there evidence of splashing on the walls or ponding at grade?

**Ventilation and Filtration**

Ventilation is an important consideration in reducing moisture and growth of microorganisms, especially where climate control systems are impractical. Efficient ventilation is often an attribute of older buildings, although alterations may have diminished this capability.

**Cross-ventilation:**

Is there cross-ventilation?

Does the arrangement and shape of rooms, the distribution of wall openings and size of the openings allow effective cross-ventilation?

Is cross-ventilation impeded by exhibition cases or other fixtures?

Is cross-ventilation impeded by closed doors between rooms?

**Stack-ventilation (vertical):**

Does arrangement and shape of floors and vertical features such as stair halls, atria and closed courtyards allow effective stack-ventilation?

Is stack ventilation impeded by alterations?
**Ventilation control (cross and stack):**

How are ventilation controls, such as shutters, operated? Are the opening and closing of these devices regulated by procedure?

**Mechanical ventilation:**
Are fans used to supplement natural ventilation? If so, where are they deployed?

**Air filtration:**
Are wall openings protected by insect screens? Draperies?

**Natural Light**
The incidence and intensity of natural light entering a room may affect room temperature. Natural light can have an adverse effect on collections.

**Light entry through wall openings:**
How are wall openings configured to reduce light entry? Awnings or overhangs? Recessed openings in thick walls? Shutters? Louvers?

How are natural light controls, such as shutters, operated? Are the opening and closing of these devices regulated by procedure?

Are there skylights?

What is the size of the windows? What is their location and distribution in the building?

Are windows glazed? Are they protected from direct insolation? Are UV/IR filters used on glazed windows? How often are these checked/ replaced?

What is the effective day lighting permeability of windows, sky lights and other openings (day lighting access areas / room surface).

**Structure**
The building construction and arrangement, and their response to the extraordinary loads of excess occupancy, winds and seismic activity may increase or decrease risk to the collections.

**Structural capacity for occupancy:**
Is floor load capacity adequate for the maximum number of visitors? Special events? Balconies?

Is floor load capacity adequate for concentrations of collections storage? Special exhibits or large objects?

**Structural resistance to winds:**
Does the main structure, including roof framing, adequately resist wind loads?
Do appurtenances and projections, such as chimneys, towers, awnings, canopies, and balconies adequately resist wind loads?

Do roof cladding or membrane coverings remain secure and water-tight against high winds?

Are wall opening closures remain secure and water-tight against high winds?

**Structural response to seismic activity:**
Is the building structure earthquake resistant?

What portions of the building are vulnerable to collapse or severe dislocation in a seismic event?

Are appurtenances and projections, such as chimneys, towers, awnings, canopies, and balconies, braced for ground motions?

**Protection against insects, rodents, birds, animals**
Describe the pest detection and control program (are traps used for monitoring the presence of insects, what areas of the building are monitored, who has responsibility for the monitoring program, is a log or register maintained of pest problems, does the institution have a history of a particular type of pest problem.

**Fire Resistance and Protection**
The building construction and configuration, as well as systems for detection and protection against fire, significantly affect the degree of fire risk to the collections. These considerations may influence strategies such as the selection of appropriate locations for collections storage areas or exhibition areas.

**Structural resistance to fire:**
Are the structural materials non-combustible? Combustible and exposed? Combustible with fire-resistant finishes?

**Interior resistance to spread of fire:**
Are interior wall finishes combustible or non-combustible?

Are interior floor finishes combustible or non-combustible?

Are interior ceiling finishes combustible or non-combustible?

Can fire travel horizontally between rooms without interruption?

Can fire travel vertically between floors without interruption?

**Interior resistance to spread of smoke:**
Can smoke communicate horizontally between rooms without interruption?

Can smoke communicate vertically between floors without interruption?
Fire detection and alarm:
Describe the fire detection and alarm system. Smoke or heat detectors with automatic alarm and notification? Manual stations with subsequent alarm and automatic notification? Evaluate the effectiveness of each type of fire/smoke detector and deployment.

Fire protection:
Describe the type of fire protection system. Automatic sprinkler system? Manual hose stations at critical locations? Hand-held portable fire extinguishers?

Are these appropriate to the size and type of fire that may be likely?

How is the system checked and maintained?

Can fire brigades quickly access critical areas of the building to extinguish a fire? How is such emergency access controlled? Does the building configuration impede access after security measures are removed?

Physical Security
The building construction and configuration, as well as systems for detection of security breaches, significantly affect the degree of theft and vandalism risk to the collections, and may influence strategies as the appropriate location in the building for collections storage areas or exhibition areas.

Structural resistance to exterior entry:
Is the wall construction sufficient to resist forced entry? Roof construction? Floor and subgrade construction?

Resistance of wall and roof opening closures to exterior entry:
Are closures in the walls, such as shutters, windows and doors, adequate to resist forced entry? Are roof closures, such as hatches, scuttles and skylights, adequate to protect against forced entry?

Are exterior doors guarded or controlled?

Interior resistance to entry of sensitive areas:
Are interior partitions and doors surrounding collections exhibit and storage areas adequate to resist forced entry?

Interior layout of public spaces and ease of observation:
Does the arrangement of public corridors and exhibition spaces permit visual supervision of visitors by museum docents and guards? Are there "blind spots" created by remote rooms or temporary exhibition panels?

Lock hardware:
Are door and window locks and hardware adequate to deter entry?
**Deterrence measures:**
Is there low contrast exterior lighting to deter unauthorized exterior access?
Is interior lighting maintained at low levels to permit monitoring?

**Security detection systems:**
1. COLLECTION USE AND MANAGEMENT

Type of collection

What kinds of collections does the institution own?
- Archaeology
- Electronic media
- Ethnography
- Fine and decorative arts
- Graphic art
- History
- Geology/mineralogy/paleontology
- Industrial machinery
- Library/archival material
- Military
- Musical instruments
- Natural history
- Science/technology
- Sound recordings

Use of collections

How is the collection used?
- Exhibitions (indicate whether in-house and/or traveling exhibitions)
- Scholarly research
- Public education/outreach

Are collection materials used in hands-on, educational activities? If yes, what percentage? How often?

Collection care policies

Is there someone responsible for caring for the collections in the institution?

Does the person's job description reflect these activities?

Is there a conservator on staff?

Who is allowed to handle the collection?

Does the institution obtain conservation services for the collection through an external provider?
Has the institution ever engaged a conservator to assess all or part of the collections? If yes, elaborate (include date of assessment)

Where does the responsibility for each of the following activities lie (i.e., title of staff member, outside provider, etc.)?

- Maintenance of the collections in storage
- Labeling/ marking of collection materials
- Cleaning, conserving/ restoring collection materials
- Preparing collection materials for exhibit or loan
- Packing and unpacking of collection materials

Is formal orientation or training provided for staff in the following areas:

- Collection conservation procedures
- Handling, exhibiting, storing collection objects
- Labeling/ marking objects
- Packing/ unpacking techniques
- General housekeeping and cleaning

Describe the policies and procedures (written or observed) for handling, management and/or use of the collections. Are there any procedures that place the collection at risk?

Who (1) develops, (2) implements, and (3) has authority to modify this policy?

Does the institution have a long-range conservation plan for the collection. (This plan should be evaluated in light of the findings of the assessment.)

Who (1) develops, (2) approves, and (3) implements long-range plans for collection care:

(1)
(2)
(3)

Are funds regularly budgeted for the conservation of the collections? Has this amount changed over the past five years? Is the amount allocated adequate to meet the needs of the collection? (Describe how the mission of the institution and/ or its operations should support each other to reflect collections conservation concerns.)

Describe the institution’s condition reporting procedures. How is the condition of the collections assessed. Is photographic documentation a part of condition reporting?

Are there any procedures that are unique to the institution's types of collections (i.e., preparation, dissection, sampling).

Does the institution permit objects to leave the premises?
Reason objects may leave the institution:
- Examination/ analysis
- Exhibition
- Research
- Other

Does the institution use a contract or written guidelines that specifies the terms under which objects from the collection may leave the institution? (Include samples of these documents, if available.)

Who in the institution reviews the condition of an object, and approves its leaving the institution?

What are the criteria for allowing an object to leave the institution?

Does someone in the institution perform condition reports before and after an object from the collection leaves the premises?

Does the institution borrow objects from other collections? What is the purpose of borrowing?
- Examination/ analysis
- Exhibition
- Research
- Other

Does the institution adhere to specific guidelines or contractual arrangements when borrowing from other institutions?

Does the institution perform condition reports when borrowed objects are received and returned to their owners?

**Exhibition Policies and Systems**

What percentage of the collection is on exhibition?

Are there permanent exhibitions? Approximate percentage of objects on permanent exhibition?

Are there temporary exhibitions? Approximate percentage of objects on temporary exhibition?

How often do the temporary exhibitions change?

What percentage of objects on display in exhibitions are borrowed from other institutions?
Who has responsibility for the following activities?
- Choosing objects for exhibitions
- Designing exhibitions
- Installing exhibitions
- Monitoring the condition of collections on exhibit
- Monitoring the environmental condition of collections on exhibit

Are collection materials displayed in areas other than the exhibition galleries (i.e., offices, corridors, outdoor areas, etc.). If yes, where?

Describe the manner in which objects are exhibited:
- enclosed exhibition cases
- frames
- open display

Are there adequate physical barriers for objects on open display?

For what purposes are the exhibit cases accessed by staff? How often are they accessed?

What materials are used to construct exhibition cases? Are these materials tested for possible off-gassing of harmful materials prior to use?

Are the exhibition cases air-tight? If ventilation holes or spaces exist, is screening and/or filtering material used over the gaps to prevent the entry of dust and insects?

Are micro-climates used to control the RH within cases? If so, who constructs and maintains them? How often are the micro-climates monitored and maintained?

Have there been any noticeable problems with them?

Are objects on display monitored for changes of condition?

Are objects on exhibition safely supported and secured? Are proper mounting and support materials and systems used?

How are the galleries spaces (floors, surfaces of cases, other furniture) cleaned? How often?

Are any cleaning materials used in proximity to the exhibited objects that may prove harmful to them?

Has any previous damage been observed from cleaning materials/ practices in gallery areas?
Storage Policies and Systems

Is all of the collection storage located in the same building?
If not, in which buildings is storage located?

How is storage of the collection organized?
- By culture
- By material
- By object type
- By size
- Other:

Is there short-term temporary storage or preparation areas? Under what circumstances are objects brought into these areas?

Where are the storage areas located with respect to other museum functions?

Does the museum have a special storage area for very sensitive or valuable objects?
If not, are any special provisions made for these materials?

Are storage areas used for activities other than collection storage? Can these activities pose a risk to the collection?

How many doors open onto the storage area? Are all of these doors in regular use?
Are doors secured and alarmed to protect against unauthorized entry? Are doors gasketed to protect against environmental changes and the entry of pests?

Are storage areas easy to clean and inspect? Can staff clean on top of and under cabinetry?

Is there enough space to allow easy movement of staff, objects, and equipment through storage areas?

Do water, steam, drain, fuel, or sewer pipes run through or immediately adjacent to storage areas?

Is there equipment or building services requiring monitoring and servicing by museum personnel?

Are the storage areas located below grade? Does water drain away from the building, or do storage areas flood in heavy rains?

Are objects, and furniture equipment located at least four inches off the ground to protect from possible flooding?

Are collections stored in places other than designated and secure storage areas? (Attics, offices?)
Are storage areas over-crowded?

Are collection objects placed on the floor or in the aisles between cabinets?

Does the institution need additional space for storage? Is there appropriate space within the institution that can be used for this purpose?

Is space in the existing storage area used well? Should it be reconfigured for better security of the collection/ or better use of space?

Describe the type of storage furniture / systems. Are they appropriate to the materials being stored?

Describe the general condition of storage furniture and equipment.

Are materials which may potentially harm collection objects used in the storage area?

Is metal cabinetry free from rust or other corrosion?

Is cabinetry free from splinters, nails, and bolts which may damage objects?

Do cabinets close securely to exclude pests and dust? Are there gaskets? Are cabinets locked?

Are there non-collection objects housed in storage areas that may potentially harm the collection?

Are objects well-supported, padded?

Have all objects been assigned locations within storage?

Are the locations of objects clearly indicated on storage furniture?

Are objects in drawers, cupboards or shelves readily accessible, or must some objects be moved to obtain access to others?

Are vulnerable objects buffered against contact with acidic materials (woods, papers, boards) when stored in proximity to them?

Who has access to storage areas?

Are access logs maintained?

Are persons who are not members of staff (i.e., visiting scholars) permitted to work in storage areas unaccompanied?

Does the institution have written policies or guidelines covering:

- handling of collections in storage?
- activities permitted in storage?
- moving objects into or out of storage
- other policies or guidelines?

(If possible, the collection assessor should examine copies of written policies or guidelines)

Describe the procedures for moving objects into and out of storage.

Are collection re-locations documented?

Are storage areas routinely monitored for
- building problems?
- evidence of pests and other biodeterioration?
- inappropriate levels of RH?
- condition of collection materials?

Does the institution have policies and procedures for preventing damage to the collections in storage as a result of an emergency?

Does the institution have a written plan for responding to an emergency affecting the collections in storage?

*Other institutional activities with implications for the collection*

*Photography & Video/Filming*

Does the institution have a policy for photography or filming of the collections?

Does the institution photograph the collections?

Are visitors allowed to photograph the collections?

If photography of collections is permitted, what type of lighting is allowed (flash, floodlight illuminated, etc.)?

Are special precautions taken to prevent damage due to photography or filming?
2. SENSITIVITIES OF THE COLLECTION TO CLIMATIC CAUSES OF DETERIORATION

Indicate the predominant materials represented in the collection.

**Inorganic**
- Ceramics, pottery
- Clay, unbaked
- Fossils
- Glass
- Metal
- Minerals
- Plaster
- Stone

**Organic**
- Amber
- Antler, bone, ivory
- Barkcloth, objects
- Basketry
- Botanical materials (dried seeds, grasses)
- Carbonized materials
- Feathers
- Lacquer
- Leather, hide and skin
- Mummified remains
- Paper, papyrus
  - Oriental papers
  - pastels, charcoal stamps
- Photographic materials
  - Cellulose nitrate
  - Diacetate films
- Shell
- Textiles
- Wood

**Collection objects of composite materials**
- Books
- Contemporary art
- Ethnographic artifacts
- Costume and costume accessories
- Furniture
- Mosaics
- Musical instruments
- Paintings
• Polychrome sculpture
• Scientific, technical instruments
• Wall paintings
• Other (specify)

Summarize the general condition of the collection.

Are there any collection condition problems presently observable?

Describe the type of problem, collection material affected, and location within the building.

Is the deterioration recent or historic damage?

Is the deterioration active or inactive?

Is there any indication of the cause of the deterioration?

WHAT ARE THE CHIEF RISK FACTORS (BOTH PRESENT AND POTENTIAL) FOR THE COLLECTION?

Relative humidity/ temperature

Inappropriate RH is that which is either a) excessively high or low; b) involves changes or cycles of change in temperature and/or relative humidity.

Which materials in the collection are at particular risk from inappropriate levels of RH and/ or temperature?

Identify collection areas within the museum that may be prone to inappropriate levels/ changes in temperature and RH. Do these areas contain sensitive materials?

Is the institution trying to maintain particular levels of RH and temperature in collection areas? What are these target levels?

Are these levels of temperature and relative humidity achievable year round with present climate control strategies? What are the chief obstacles to achieving these levels?

Does the attempt to achieve or maintain these levels pose a risk to the collection due to the possibility of fluctuations?

Radiation

Which materials in the collection are at particular risk from inappropriate levels of visible/ invisible light?

Have the staff noticed fading of collection materials on display, or fading of wall finishes, fabrics on or near windows or in display cases?
Does the institution have lighting policies which are based on the sensitivity of the various collection materials?

Describe the use of natural light in galleries, exhibition spaces, and storage areas and the types of objects illuminated.

Describe the type(s) of artificial ambient lighting used in galleries, exhibition spaces, and storage areas (electric -- i.e., fluorescent, incandescent, tungsten halogen, fiber optics, neon, etc. -- and non-electric -- i.e., candles, kerosene lamps, etc.)

Describe the type(s) of artificial exhibition lighting used for object/exhibition case illumination. Are lamps/ballast’s placed inside of exhibition cases? If so, are measures taken to reduce the build-up of heat within the cases?

Describe any types of filtration used to reduce light intensity (i.e., UV shields on fluorescent tubes, intensity controls, etc.).

Are exhibits designed to limit exposure of light sensitive materials?

If a policy to limit light exposure exists, are the recommended light levels/ periods of exposure regularly followed? If not, what are the chief obstacles to following these recommendations?

Describe any curtains, blinds, shutters, awnings, or other light reduction materials (i.e., light reduction coatings, film, sheet goods, etc.) used to reduce the intensity of the light entering the building through windows or skylights.

If blinds and curtains are used, how are they controlled to ensure that the objects are protected from high intensity natural light?

Have wall surfaces that reflect natural light been treated to absorb ultraviolet radiation?

**Contaminants**

Which materials in the collection are at particular risk from gaseous contaminants from either indoor or outdoor sources?

Is there any present evidence of damage by gaseous contamination. Describe.

Are there potential sources of additional gaseous contamination?

Describe any sources of or activities producing hazardous gasses within or around the museum which might be dangerous to the collections (i.e., use of certain wood products in storage/ exhibition furniture, paints, custodial cleaners, etc.)

Which materials in the collection are at particular risk from particulate contaminants from either indoor or outdoor sources?

Is there any present evidence of damage by particulate contaminants. Describe.
Are there potential sources of additional particulate contaminants?

Describe any activities generating particulates in or around the museum which might prove a risk for the collection (construction activity, smoking, fuel burning, auto exhaust, agricultural or industrial activity, etc)

Is the collection routinely monitored for gaseous/particulate pollution? If so, by what means and how often?

Does the museum have at the present time a strategy for dealing with gaseous and/or particulate pollutants (i.e., filtration system, no smoking policy, construction precautions, entry vestibules, sealed cases, dust covers, etc.). How effective is this strategy?

**Biodeterioration: Insects, rodents, birds, animals**

Which materials in the collection are at particular risk from attack by insects and other pests?

In which areas of the museum are these collection materials concentrated?

Has there been a history of damage by insects and other pests in collection areas?

Which collection materials and areas have been most affected?

Is there evidence of the presence of insects and other pests (frass, droppings, nests) in or near collection areas?

Does the institution have a regular monitoring program for pest management and control within the collections? If yes, who has the responsibility for this program (staff or contractor)?

Describe the pest detection and control program (are traps used for monitoring the presence of insects, what areas of the building are monitored, who has responsibility for the monitoring program, is a log or register maintained of pest problems, does the institution have a history of a particular type of pest problem. If so, please describe)

Describe measures for preventing the entry of pests into collection areas:

Are there screens on windows?

Are flowers (fresh or dried), plants, or firewood allowed in the structure?

Is food stored, prepared, or consumed in the building? Are special areas set aside for the storage, preparation, and consumption of food?

Are special precautions taken for disposal of food wastes or food storage?
What custodial measures are taken to keep all food preparation and consumption areas clean and pest-free?

Are pesticides used routinely on the structure, around the exterior of the structure or in interior spaces? What is the schedules for application?

If pesticides are used, in what formulations, and on what materials?

Indicate any other measures undertaken to prevent or eradicate pests.

Are incoming collection objects or objects borrowed from other institutions isolated/examined before entry into collection areas?

Are incoming non-collection materials (paper or wood products, food, etc.) isolated/examined before entry into collection areas?

Are pesticides used routinely on the collections? What is the schedules for application? If pesticides are used, in what formulations, and on what materials?

Indicate any other measures undertaken to prevent or eradicate pests (i.e., freezing, heating, modified atmospheres, etc.).

**Biodeterioration: Micro-organisms: fungi, mold**
Which materials in the collection are at particular risk from attack by molds and fungi?

In which areas of the museum are these collection materials concentrated?

Has there been a history of damage by micro-organisms in collection areas? Which collection materials and areas have been most affected?

What are the probable sources of damage by micro-organisms?
THREATS TO THE MUSEUM COLLECTION
AND BUILDING FROM NATURAL / MAN-MADE EMERGENCIES

INSTITUTIONAL PREPAREDNESS

Is the institution located in an area of known risk of natural disasters?

To which type of disasters is the area prone?

Who in the institution is responsible for the security of visitors and staff?

Who in the institution is responsible for the safety of the collection and the building?

Does the institution have a permanent security staff?

Does the institution use an outside contractor either instead of or to supplement permanent security staff?

Are security personnel on duty 24 hours? If not, what are the hours?

Does the institution have an emergency preparedness plan?

What type of emergencies does the plan address?
  • Civil emergency
  • Natural emergency (fire, flood, earthquake, etc.)

Who in the institution has copies of the plan? Are there copies of the plan located at various points in the building and do the appropriate members of staff know the locations?

Is the plan current? How often is it reviewed and updated?

Does the institution have plans and procedures for preventing damage to the building and the collection?

Does the institution have a written plan for responding to an emergency affecting the building and collections?

Do all staff members know what to do in an emergency? Are there regular emergency preparedness drills?

What types of local/ national/ private services are available to the institution in case of an emergency?

Does the institution maintain supplies to cope with emergency situations. Are these supplies intended for 1) human needs, 2) building needs, and 3) collection needs? Where are the emergency supplies kept? Are they inventoried regularly?

For institutions in areas of potential natural disasters such as earthquakes or flooding, have special precautions been taken to minimize damage?
Do local emergency preparedness/response coordinators (fire department, local government) have copies of the emergency preparedness plan? Have they been consulted in the development of the plan? Have they been informed of the special nature and features of the buildings and the collections?

**THREAT CHARACTERIZATIONS**

**Fire**

The irreversible and potentially catastrophic effects of fire on the museum, its collections, and possibly occupants, are well documented. The building structural response to fire is considered in the section The Museum Building: Characterizations

**Ignition sources:**
What are the potential internal ignition sources? Consider electrical systems, heating systems, cooking, visitors, special events or activities, arson and other factors.

What are the potential external ignition sources? Consider lightning, adjacent buildings and occupancies, vehicles and traffic, arson and other factors.

**Fire brigades:**
What is the proximity of fire brigades to institution? Are staffing and method of notification adequate to respond to museum needs?

What are typical notification times and response times for the off-site security services? Are response times consistent?

Describe available fire fighting apparatus, method of notification, water supply volume & reliability, and other factors.

Does the institution have systems for the detection and suppression of fire? Describe (i.e., sprinkler system, smoke detectors, fire extinguishers, etc.)

How often is the system tested, and by whom?

Which spaces are protected by these systems?

Are the systems adequate for the needs of the building and the collection?

Does the institution have regularly scheduled inspections by the fire department?

Where is the water supply? Does the water come from a city water supply? Are there a sufficient number of fire hydrants near the institution?

Are there supplemental sources of water in case of a fire?

Are sprinkler heads and nozzles located so that they do not pose a threat to the collection?
Wind, Hurricanes, Typhoons
High winds from storms may interrupt the utility infrastructure to the building. High winds may also threaten building structural integrity and water-tightness; the building structural response to storms is considered under 4.5.

Warning systems:
What are the available methods for storm warnings?

What measures must be undertaken to secure the building in advance of the storm?

Utility infrastructure:
What are risks of interruption of primary utility infrastructure to the museum?

What are the effects of interruption?

Recovery:
What are planned responses before or after storm to reduce collateral damage?

Lightning
Lightning can initiate structural fire and can interrupt critical systems.

Risk to structure:
Evaluate lightning risk to structure. Consider location and adjacencies, building height, construction, prior lightning frequency.

Risk to systems:
Evaluate lightning risk to systems. How are electrical, telecommunications, and alarm systems isolated from potential lightning strikes.

Method of protection:
Is the building fitted with a lightning protection system?

Flooding
Flooding may cause structural failure from concentrated surface flows or may inundate building or collections, isolating the building from access. Wave surge may cause structural failure from wave impact. Flooding may interrupt critical systems.

Surface water:
What are risks from upstream or upland flooding due to storms?

Coastal flooding and waves:
What are risks of coastal flooding from tides, waves, storm surge?

Utility infrastructure:
What are risks of interruption of primary utility infrastructure to the museum?

What are the effects of interruption?
Recovery:
What are planned responses before or after flooding to reduce collateral damage?

Seismic
Seismic events may threaten collections in storage and on exhibit due to inadequate response by exhibition supports or collections storage shelving. Seismic events may interrupt the utility infrastructure to the building. Building structural response to seismic events is considered under the section “Building: Characterizations”

Collections storage:
Do collections storage methods provide adequate structural response to ground motion and prevent collapse of supports for collections objects?

Collections exhibition:
Do collections exhibition mounts and cases provide adequate structural response to ground motion and prevent collapse of supports for collections objects?

Utility infrastructure:
What are risks of interruption of primary utility infrastructure to the museum?
What are the effects of interruption?

Recovery:
What are planned responses before or after earthquake to reduce collateral damage?

Security
Note: for obvious reasons communication of security evaluations should be done with confidentiality. Report copies with security evaluations should not be widely circulated. The security provided by the building itself is considered above.

Police or security service:
What is the proximity of police and security services to institution? Are staffing and method of notification adequate to respond to museum needs?
What are typical notification times and response times for the off-site security services? Are response times consistent?

Access control:
Does the institution have a policy to secure against unlawful entry and theft?
Are there exterior and interior areas accessible to unauthorized persons? During operating hours? When closed?
How is access to exterior and interior areas by authorized persons controlled? Is access to collection areas restricted?
Are persons who are not members of staff (i.e., visiting scholars) permitted to work in collection storage areas unaccompanied?
Are access logs maintained?
How are special events, including service personnel, such as caterers, controlled?

Are objects in the collection registered and documented? Do photographs exist of most/all of the collection?

Are locations of objects checked regularly? By whom?

**Security systems:**

Describe any systems or devices used to secure the building and its collections, i.e., window bars, security guards, alarms, surveillance cameras, movement detectors, etc.
Appendix H
Monuments Watch Netherlands—Utrecht, Sample Report
VOORBEELD VAN EEN INSPECTIERAPPORT 2006

Objectnummer:...
Woonhuis
Artiest:

<table>
<thead>
<tr>
<th>Objectnummer</th>
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<td>Woonhuis</td>
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<tr>
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<th>burge vetterfaer</th>
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Algemeen

De constructie staat (naar) in het woordhuis in goed. De onderhoudsvoorwaarden zijn goed. Uit de rapporten van de afgelopen 5 jaar blijkt dat de onderhoudsvlucht van het gebouw stabiel is.

De uitslag van het test zijn dat de regelmatige onderhoud wordt uitgevoerd. Hieronder ziet u de rijen van de regelmatige onderhoudsbeurzen.

<table>
<thead>
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Beschikbare en zorgdragerij

Volgens de gegevens en richtlijnen voldoet het gebouw voldoende aan de eisen.

Empowering

Informatie over rechtsstandaard, veiligheid en inzameling van personenstations.

Uitgevoerde werkzaamheden door de monumentswacht

Een bepaalde zorgmaatregel op de ruimte van de gestart met affectie voor u. De zorgmaatregel is nog niet uitgevoerd.

Verwachte maatregelen

Affectie voor...

[Monumentswacht Buiten]
Diamantstraat 28,
1013 EZ Amsterdam
Tel.: 020-2340000
Fax: 020-2349900
E-mail: monumentenbuiten@buiten.nl
Website: www.monumentenbuiten.nl
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*De tabel voor zowel de uiteindelijke uitkomsten als de gegevens over de observatie van het blad is hierboven*.
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**Datum**

**MONUMENTENACHTIG**
01. De voeg valt weg tussen de hardstenen platen. (1.2.2)

02. Door roestende diefijzers springt de steen kapot. (1.7.2)

03. De hoekkepers en nokvorsten liggen los en schilveren. (2.2.2)

04. Slecht schilderwerk raam aan de noordgevel. (1.7.2)
Appendix I
Monuments Watch Flanders, Checklist Form
Courtesy Maintain Our Heritage and Monuments Watch Flanders
The following criteria are used to judge the state of the different parts of the building:

- **G** = Good. For a good maintenance of the monument no immediate works to be carried out.
- **R** = Reasonable. The recorded defects are not acute. However, a raised vigilance is needed in order to intervene in good time.
- **M** = Moderate. Local defects were established. These need to be repaired in good time.
- **B** = Bad. An urgent and thorough repair is needed.

These are which could not be inspected because e.g. of a lack of safety, are pointed out as **N** = not. You will find a justification in the explanation column. A flat and thorough intervention is needed.

The numbers between [ ] refer to a situation plan at the back. The letters point out local defects.

### Maintain Our Heritage

<table>
<thead>
<tr>
<th>1. Roofing</th>
<th>2. Conservation</th>
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<tr>
<td>1.1. Shingles</td>
<td>1.2. Slates</td>
</tr>
<tr>
<td>1.1.1. Tiles</td>
<td>1.2.1. Hip tiles</td>
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<tr>
<td>1.1.2. Stone</td>
<td>1.2.2. Hip tiles</td>
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<tr>
<td>1.1.3. Slate (Slate, ... )</td>
<td>1.2.3. Wheats</td>
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<tr>
<td>1.1.4. Organic materials</td>
<td>1.2.4. Tiling (Tiles, ...)</td>
</tr>
<tr>
<td>1.1.5. Structures related</td>
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<td>1.1.6. Other</td>
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### Maintaining Value

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<tr>
<td><strong>2. Penetrations</strong></td>
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<td>2.1. Breaches</td>
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<td>2.2. Skirt pipes/Leat/Inlets - Internal</td>
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<td>2.3. Gutter outlets (Pipes)</td>
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<td>2.4. Chimneys (Above roof)</td>
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<td>2.5. Cowlings</td>
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<td>2.6. Airlocks - on chimney</td>
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<td>2.7. Ventilation</td>
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<td>2.8. Other</td>
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<td>3.2. Metal structure - Metal</td>
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<td>3.3. Metal structure - Cement etc.</td>
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<td>4.3.4.</td>
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<td>4.4. Other</td>
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<td>4.5. Soffits</td>
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<th>Maintain our Heritage</th>
<th>Maintaining Value</th>
<th>Module 4 - Technology</th>
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<tbody>
<tr>
<td><strong>5. External work</strong></td>
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<tr>
<td>5.1. Brickwork + pointing</td>
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*Type of gutters or type of used material according to specific situation*
### Maintain our Heritage

#### Module 4: Technology

<table>
<thead>
<tr>
<th>5.2. Stone Work - pointing</th>
<th>Maintaining Value</th>
</tr>
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<tbody>
<tr>
<td>5.2.1. Fill in types of Natural stone according to used materials</td>
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<td>5.2.2.</td>
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#### 5.3. Concrete use:

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#### 5.5. Metal or timber:

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<th>5.6. Fabric:</th>
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<td>5.6.1. Frame</td>
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<th>5.7. Architectural:</th>
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<tr>
<td>5.7.1. Wall cladding</td>
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<td>5.7.2. Bars</td>
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### Maintain our Heritage

#### Module 4: Technology

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#### 5.9. External works:

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<td>5.10.1. Carpentry</td>
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<td><strong>6. Interior</strong></td>
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<tr>
<td>6.1. Structural elements</td>
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<td>6.1.1. Floor &amp; vertical structure</td>
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<td>6.1.2. Walls &amp; ceilings</td>
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<td>6.1.3. Yards</td>
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<td>6.1.4. Cells</td>
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<td>6.1.5. Substructures</td>
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<td>6.2. Horizontal</td>
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<td>6.2.3. Floor</td>
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<td>6.3. Interior Improvements</td>
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<td>6.4. Lighting levels &amp; pathways</td>
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<td>6.5. Other</td>
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<td><strong>7. Other interior elements</strong></td>
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<td>7.1. Church furniture</td>
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<td>7.2. Office furniture</td>
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<td>7.5. Other objects</td>
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<td><strong>8. Technical equipment</strong></td>
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<tr>
<td>8.1. Lighting equipment</td>
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<td>8.2. Building control systems</td>
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<td>8.5. Other</td>
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<td><strong>9. Climate</strong></td>
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<tr>
<td>9.1. Water &amp; sewerage &amp; temperature</td>
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<td>9.2. Light</td>
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<td>9.3. Other</td>
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<tr>
<td><strong>10. Prevention</strong></td>
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<td>10.1. Fire</td>
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<td>Maintain our Heritage</td>
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<tr>
<td>10.1. Harvest</td>
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<td>10.2. Harvesting</td>
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<td>10.3. Conservation</td>
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<td>10.4. Cleaning</td>
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<tr>
<td>10.5. Other</td>
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<tr>
<td>11. Safety / Accessibility / Hygiene</td>
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<tr>
<td>11.1. User-friendliness</td>
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<td>11.1.1. Ease</td>
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<td>11.2. Management</td>
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<td>11.4. Other</td>
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<td>12. Site</td>
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<tr>
<td>12.1. Surrounding area presence</td>
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<td>12.2. Presence</td>
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<tr>
<td>12.3. Fences</td>
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</tbody>
</table>
Appendix J
Monuments Watch Flanders, Training Program

Courtesy Maintain Our Heritage and Monuments Watch Flanders
A1. MONUMENTENWACHT FLANDERS

The following documents are included by kind permission of Monumentenwacht Vlaanderen.

A1.1 Training programme

TRAINING PROGRAM

MONUMENTENWACHT VLAANDEREN

1. General context – Conservation of cultural heritage
   1.2. Law concerning Cultural Heritage (in Flanders)
   1.3. Administrations, Institutes, Associations, etc. working for the Cultural Heritage
   1.4. Historical ways of building (in Flanders): General architectural, historical and typological principles
   1.5. Historical ways of building (in Flanders): General structural and constructional principles
   1.6. Inspection- and report techniques
   1.7 Safety regulations: theory and practice (Advanced Industrial Rope Techniques)

2. Maintenance of Historic Buildings
   2.1. Roof covering
      2.1.1. used materials,
      2.1.2. construction techniques
      2.1.3. causes of deterioration, decay and damage and its interpretation
      2.1.4. recommendations of maintenance or repair
   2.2. Rainwater disposal
      2.2.1. used materials,
      2.2.2. construction techniques
      2.2.3. causes of deterioration, decay and damage and its interpretation
      2.2.4. recommendations of maintenance or repair
   2.3. Roof structures
      2.3.1. used materials,
      2.3.2. construction techniques
      2.3.3. causes of deterioration, decay and damage and its interpretation
      2.3.4. recommendations of maintenance or repair
   2.4. Walls and vaults (structural, inside and outside)
      2.4.1. used materials,
      2.4.2. construction techniques
      2.4.3. causes of deterioration, decay and damage and its interpretation
      2.4.4. recommendations of maintenance or repair
2.5. Floors and ceilings (structural)
   2.5.1. used materials,
   2.5.2. construction techniques
   2.5.3. causes of deterioration, decay and damage and its interpretation
   2.5.4. recommendations of maintenance or repair

2.6. Finishes, fixtures and fittings
   2.6.1. used materials,
   2.6.2. construction techniques
   2.6.3. causes of deterioration, decay and damage and its interpretation
   2.6.4. recommendations of maintenance or repair

2.7. Cellars and foundations
   2.7.1. used materials,
   2.7.2. construction techniques
   2.7.3. causes of deterioration, decay and damage and its interpretation
   2.7.4. recommendations of maintenance or repair

2.8. Doors, windows and stairs
   2.8.1. used materials,
   2.8.2. construction techniques
   2.8.3. causes of deterioration, decay and damage and its interpretation
   2.8.4. recommendations of maintenance or repair

2.9. Accessibility of all parts of the building

2.10. Services (heating and ventilation, electrical fittings, fire fighting, lightning security, …)
Appendix K
Maintain Our Heritage, Sample Inspection Report for Bath Pilot Program
Courtesy of Maintain Our Heritage
2.1 **BRIEF DESCRIPTION OF THE BUILDING**

This property was designed and built by Sir Hardly Anyone in 1780 as part of a large terrace of buildings. The property consists of 3 main floors with a basement fronting onto the main road and a vaulted sub basement storage area set below the main building. There is also accommodation found within the attic area.

The property has been divided up into 5 separate flats with part of the basement area being converted into habitable accommodation.

The property is built from well bedded and jointed ashlar block to the front elevation with a mixture of rubble wall and lower quality ashlar block to the rear elevation. The high level stone cornice detail is heavily weathered and worn with many of the stone dentils missing or badly corroded by the effects of pollutants and climatic weathering.

The stone surface to the rear elevation is also heavily stained due to its sheltered location. A streaking effect can be seen to this elevation where damaged sections of the stone window cills has allowed water to ‘wash’ the stone below these areas.

There has been some localised movement to the building with a number of cracked cills and lintels as well as movement cracks running along mortar joints. There has been a substantial amount of movement to the basement storage area that fronts onto the main road. A number of cracks were evident to both the brick vaulted ceilings and walls to both vaults.
2.2 THE INSPECTION PROCESS

The building was inspected as follows:

Front and rear elevations were examined using binoculars from ground level. Access via harnesses and blocks were not considered necessary. Basement and vaulted cellar areas were also visually inspected.

Main roof coverings to the front and rear elevations were inspected via dormer roof extensions set into the front and rear roof slopes. Roof voids to both front and rear roof structures were also accessed.

Sections of wall etc were examined by looking out of windows on each floor. Internal wall surfaces and suspect damp areas were all examined visually from within.

Recommendations for work items are prioritised in the following way:

- ‘A’ – Work should be done immediately
- ‘B’ – Should be done within the next six months or before winter
- ‘C’ – Should be done within the year
- ‘D’ – Should be done as part of a regular maintenance programme

3. A & B PRIORITIES NOTED DURING INSPECTION

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Priority</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>B</td>
<td>Provide balloon gratings to gulley openings within parapet gutters.</td>
</tr>
<tr>
<td>3.1</td>
<td>B</td>
<td>Renew lead detailing into hopper head draining from lead flat roof area, ensure lead is well pointed into wall opening.</td>
</tr>
<tr>
<td>4.1</td>
<td>B</td>
<td>Provide grating/cover to gulley opening of secret gutter.</td>
</tr>
<tr>
<td>4.2</td>
<td>A</td>
<td>Provide access hatch within roof void to gain access to central roof valley.</td>
</tr>
<tr>
<td>5.1</td>
<td>B</td>
<td>Ease and adjust dormer windows and redecorate all joinery.</td>
</tr>
<tr>
<td>7.1</td>
<td>B</td>
<td>Clear and clean downpipes to front and rear elevations.</td>
</tr>
<tr>
<td>8.1</td>
<td>B</td>
<td>Improve weather bar detail to door frame of rear entrance door.</td>
</tr>
<tr>
<td>10.1</td>
<td>B</td>
<td>Specialist advice should be gained regarding existing movement cracks to vaulted cellar area.</td>
</tr>
<tr>
<td>10.1</td>
<td>B</td>
<td>Repoint and renew defective brickwork to vaulted cellars. Clear and clean all gullies and channels, relay cracked/uneven flagstones.</td>
</tr>
</tbody>
</table>
4. INSPECTION REPORT

- Shared gulley outlet
- Loose copings
- Slate pitched roof
- Internal valley
- Natural slate roof covering
- Defective stone wall
- Lead flat roof to stairwell
- Rear Parapet gutter
- Secret gutter outlet
- Dormer extensions
- Central valley gutter
- Render to parapet wall
### MAINTAIN OUR HERITAGE

**Roof Coverings – Main Building**

<table>
<thead>
<tr>
<th>Photograph</th>
<th>Description</th>
<th>Condition</th>
<th>On Site Action</th>
<th>Recommendation</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td>Natural slate roof covering to front and rear roof slopes. Mansard roof construction with dormer window extensions set into roof structure to lower pitches to both elevations. Detail between change in roof pitch is protected by an external lead flashing and with internal roofing felt (sarking).</td>
<td>Roof coverings in reasonable condition, evidence of metal tinges holding a number of slates into position. Surface of slates to front elevation slightly more weathered due to increased exposure to pollution and climate variations. No evidence of loose/slipped slates, roof vents have been installed to rear roof slope. No evidence of water ingress internally within roof void or top floor flat. Stone ridges are present to the apex of both pitches, appear to be well bedded/secure, minor pointing defects seen, especially to more exposed front elevation.</td>
<td>Inspect slate roof coverings every 6-12 months. Ensure that slates remain well secured and use tinges to refix loose/slipped slates. Ensure that roofing felt and lead flashings at change in roof line adjacent to dormer windows remains watertight and secure. Any worn/defective areas should be replaced. Ensure that ventilation grills within slate vents remain clear and unobstructed. Ensure that stone ridges remain well bedded and secured. Repoint loose/defective mortar where missing and replace worn/decayed stones where necessary.</td>
<td>D</td>
<td></td>
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<tr>
<td><img src="image2.png" alt="Image" /></td>
<td>Outlet to secret gutter is evident to rear roof slope. Outlet drains directly onto roof slope; there is no hopper head/downpipe present. Lead detailing to outlet is weathered and worn.</td>
<td></td>
<td>Inspect lead flashings annually. Ensure that lead is well detailed into party wall junctions and below slates. Hack off loose/defective past cement mortar and replace in hydraulic lime mortar. Ideally existing render to stacks should be replaced at the same time to ensure continuity of finish.</td>
<td>C</td>
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<tr>
<td><img src="image3.png" alt="Image" /></td>
<td>Outlet to secret gutter is evident to rear roof slope. Outlet drains directly onto roof slope; there is no hopper head/downpipe present. Lead detailing to outlet is weathered and worn.</td>
<td></td>
<td>Provide appropriate hopper head and downpipe for outlet for secret gutter. Ensure that it is well detailed against slate covering and is secured with fixings. Lead overflow must drain adequately into hopper head.</td>
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<tr>
<td>Photograph</td>
<td>Description</td>
<td>Condition</td>
<td>On Site Action</td>
<td>Recommendation</td>
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<tr>
<td>2.1</td>
<td>Lead gutters are in reasonable condition. Laid to falls with debris present to both. Front parapet shares gulley outlet with adjacent building (No 7). No wire mesh/balloon grating to either gulley exit. Rear gutter drains onto a lead flat roof area above the main stairs to property. No splits or tears were visible in the lead lining and no water penetration was noted internally within the roof void. Ashlar block wall construction to both front and rear elevations. Front parapet wall has been rebuilt in the past with new stone and is in good condition. Stone copings are present to both parapets. A number of new copings have been replaced to party wall junction. Rear parapet wall was weathered and worn. Internal face of wall had been repaired/repointed in the past. Most areas were cracked and ‘blowing’ off face of wall. Many areas of loose/defective cement render. External surface to stone copings, weathered and worn to both parapets. A number of loose stones to both front and rear, especially at jn. with flat roof over stairwell. Lead reasonably well detailed into internal face of parapet walls and under eaves level slates. More pointing defects to rear parapet wall than the front wall. Upper surface of cornice to both front &amp; rear parapet walls not protected by lead sheeting/flashing detail.</td>
<td>Leave s and mud removed from gutter. Dead pigeon removed from gulley.</td>
<td>Clear and clean parapet gutters every 4-6 months. Ensure that all debris is cleared and that both gulley outlets are flushed through and remain clear. Ensure that lead remains well detailed under eaves level slates. Provide balloon grating for both outlets. Check stability of ashlar block to rear wall. Replace worn/decayed stones where necessary. Remove existing internal cement render/pointing to internal face and apply 3 layer lime mortar mix. Ensure that lead flashings and upstands are well detailed into wall before application of render. Annual inspection of lead linings, flashings and upstands to both parapets. Ensure that all pointing defects are repaired, hack out all loose/defective mortar that is identified. Repoint/rebed all loose/unstable copings. Replace worn/defective stones where necessary. Inspect copings to party walls annually, ensure that pointing is well detailed and watertight. It may be necessary to provide lead detail over upper surface to stone cornice to front and rear elevations. Ensure that lead is well detailed into face of external parapet wall.</td>
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<thead>
<tr>
<th>Photograph</th>
<th>Description</th>
<th>Condition</th>
<th>On Site Action</th>
<th>Recommendation</th>
<th>Priority</th>
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<tbody>
<tr>
<td><img src="image1" alt="Lead flat roof" /></td>
<td><strong>3.1 Lead flat roof.</strong> LEAD FLAT ROOF - Timber deck, lead flat roof to rear elevation sited over main stairwell to house. Laid to falls with some debris noted to external surfaces. Lead 'rolls' that form junctions between each lead sheet, well jointed and detailed, no evidence of water penetration internally. Surrounding ashlar parapet wall weathered/worn. Past cement pointing repairs evident. Slate ‘drip’ detail has been inserted to lower course of stone to internal face. Stone copings also are worn, some stones are loose with areas of defective/missing pointing. Surface water from this area and rear gutter drains into lead gullet &amp; hopper head. Lead not well detailed into wall opening, adjacent stone work and copings poorly pointed, potential for water to overshoot hopper head and drain down external surface of adjacent wall.</td>
<td>LEAD FLAT ROOF - Annual inspection of lead coverings. Ensure that lead rolls are well detailed and all joints and seams remain watertight. Check lead flashings are well pointed into parapet wall and repoint loose/defective mortar. Replace loose/chipped slates set into internal face of wall, ensure that gaps between slates are filled with mastic and repoint areas of defective mortar. Check stability of ashlar stones, replace worn/decayed stones, repoint decayed/loosed mortar. Renew lead detail to gulley opening. Ensure lead detail drains into hopper head correctly. Repoint loose/defective mortar to wall opening. Rebed loose copings adjacent and check stability of cornice stones, repoint open joints.</td>
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<tr>
<td><img src="image2" alt="Mono-pitch roof" /></td>
<td><strong>3.2 Mono-pitch roof.</strong> MONOPITCHED ROOF. Small single storey building used for storage. Natural slated roof covering, evidence of past slate repairs. Larger, poorly sized slates have been inserted into covering adjacent to flashing detail. Slate covering is in reasonable condition, lead flashing into main wall of building is well detailed and pointed. Slates drain into eaves level uPVC guttering, decorative condition to fascia board is fair, some flaking paint to timber surface. Pointing to junction between gable end wall and underside of slates is fair, some cracking noted.</td>
<td>MONOPITCH ROOF - provide correctly sized slates adjacent to flashing detail. Ensure that slates are held in place by metal tinges. Annually inspect condition of pointing to lead flashing, repoint loose/defective areas. Clear and clean uPVC guttering/downpipe, redecorate timber fascia in next 12-18 months, check timber for signs of decay. Repoint cracks mortar to under side of slates to gable end wall</td>
<td>C</td>
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<tr>
<td>Photograph</td>
<td>Secret Gutter &amp; Roof Voids</td>
<td>On Site Action</td>
<td>Recommendation</td>
<td>Priority</td>
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<td><strong>4.1 Secret Gutter.</strong></td>
<td>Lead lined secret gutter to rear roof void, draining directly onto external slate roof covering. Lead lining is in reasonable condition, laid to falls correctly and no evidence of debris or ponded water within gutter. Vertical lead sides are warped and sagging in places. No wire mesh/grill present to outlet within central valley area or exit onto roof slope. Secret gutter present only to rear void, front parapet gutter drains directly into shared gulley opening/hopper head on front elevation. Traditional timber trussed roof construction. Evidence of past repairs to strengthen existing timber. New timber has been inserted in a number of locations. Timbers placed to support/strengthen apex of roof have split. Roof void has been lined internally with roofing felt (sarking), some areas have been damaged/torn by birds nesting in eaves etc. Presence of a number of small wasps’ nests attached to rafters. Some rafters have split along the line of the grain, timbers are not deflecting/bowing but integrity of timber could be weakened. Insulation present to both voids, ventilation provided by secret gutter to rear void area, no permanent means of ventilation seen to front roof void area. No means roof hatch provided to allow access to central roof valley area.</td>
<td>Clear and clean lead gutter to rear void area every 4-6 months. Ensure that debris is not allowed to collect in gutter. Provide balloon gratings to both gulley exit/entrance to secret gutter. Consider provision of timber box frame support to prevent sagging and deformation of lead to vertical sections. Annually inspect roof timbers for insect attacks and decay. Ensure that timber are not bowing/deflecting. Replace torn/damaged roofing felt internally and remove all wasps’ nests in void areas. If point of access can be determined in roof coverings seal holes/gaps. Piece/splice in timber where rafters have split, check timbers for cracking especially adjacent to knots in wood which are susceptible to weakening. Ensure that insulation is placed well away from eaves level areas. This will allow better ventilation within void areas. Provide ventilation slates within front roof slope. Access to central roof valley is vital, provision of a timber framed access hatch should be considered in very near future</td>
<td>C</td>
<td>B</td>
<td>D</td>
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<tr>
<td>Photograph</td>
<td>Description</td>
<td>Condition</td>
<td>On Site Action</td>
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<tr>
<td>5.1 Dormer Extensions</td>
<td>Lead lined dormer roof extensions to both front and rear elevations. Lead flat roof areas and slate vertical ‘cheeks’ detailed into main slate roof covering adjacent. Lead covering to roof is generally in fair condition, surfaces weathered and worn. Lead flat roof laid to falls, drains onto window joinery below, no lead integral gutter present at eaves level. Seams and junctions of lead sheeting not very well detailed or welded correctly. External joinery weathered/worn with areas of bare wood and peeling/flaking paint especially to cill areas. No signs of water penetration internally, sash windows stiff and difficult to operate easily. Lead flashing detail at junction of dormer extension and main roof covering in fair condition, a number of gaps were noted between timber frame of sash window and vertical slates.</td>
<td></td>
<td>Carry out annual inspection of dormer extensions. Ensure that vertical slates remain well secured and nailed to timber frame, refix loose/slipped slates. Clean off debris from dormer roofs as required, ideally an integral lead gutter should be formed at eaves level to shed water away from window joinery. It may be necessary to replace all/some of the lead sheeting to the flat roof area to achieve this. Mastic all gaps that are present between vertical slates and timber frame. Ensure all voids/gaps are sealed and watertight/. It is very important that water is shed away from this area. Redecorate all joinery and overhaul all existing sash windows so they operate correctly/smoothly. Annual inspection of flashing details is advised. Repoint defective/loose mortar to all party wall areas and base of stacks. Ideally all internal faces of party wall should be rendered in 3 layer limed based render to provide sufficient protection to this exposed area. Ensure all copings to party walls are well bedded and secured. Repoint decayed/worn stones especially where they are damaged/missing.</td>
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<td>5.2 Flashings</td>
<td>Lead flashings present at junction of roof coverings and party walls. Pointed into wall with cement pointing. Numerous past repairs evident to most areas. Cement render is cracked and ‘blowing’ off face of party wall. Stone copings adjacent, weathered and worn surface, generally well bedded, past cement repairs evident to lower surface adjacent to party wall. Leading edges of copings missing and defective, some stones have been replaced.</td>
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**Maintain Our Heritage**

**Dormer Extensions & Flashings**

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<td>6.1 Chimneys</td>
<td>Mixture of ashlar stone and rubble wall construction to both front and rear stacks sited on the party wall junctions. All stacks are shared with adjacent properties and are in reasonable condition. No evidence of cracking or leaning. Front stack to SE corner has been partially rebuilt using new ashlar stone. Moulded bandcourses and higher level cornice details are weathered and worn especially to more exposed (SE) front elevation. Evidence of numerous past cement pointing repairs to rubble wall sections. Small areas of defective pointing where cement is 'blowing' away from surface of stone. Clay pots appear to be well bedded and secured, condition of flaunching not assessed as access to central roof valley area was not possible. Lower courses of rubble wall to NE &amp; SE stack are rendered, reasonable condition, some hairline fractures present due to high level of cement within render mix. Base of stacks generally well detailed into roof structure and coverings adjacent. Lead flashings pointed into base of stacks. Past repointing repairs evident, some areas cracked and in poor condition.</td>
<td>Annually inspect overall structural condition of stacks. Look for any cracking and deflection/leaning of stacks. Ensure that clay pots remain secure. If access to central valley area is gained it is important to check condition of flaunching and repair any cracks or defects seen. Rebed loose pots and renew pots if cracked/defective. Repair damaged/missing sections of band course and comice details. Renew worn/decayed sections. Hack off all loose and defective cement mortar pointing to all areas of rubble and ashlar stone. Renew in hydraulic lime mortar which will 'weather' far better in exposed conditions. Assess condition of individual stones, replace if worn/decayed.</td>
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Ideally cement render to stack adjacent to No 9 should be removed and renewed in a 3 layer limed based render. This should be well detailed into the existing lead flashings and run into the lower party wall areas. Ensure that all lead flashings to the base of the stacks are well detailed and all pointing is sound. Hack out loose/defective pointing and renew. Renew worn lead sections if necessary and ensure that lead is well detailed under adjacent roof coverings.
## MAINTAIN OUR HERITAGE

### Rainwater Goods & Drainage

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<tr>
<td><img src="image1.jpg" alt="Image" /></td>
<td><strong>7.1 Rainwater Goods</strong></td>
<td>FRONT ELEVATION – lead downpipe shared with adjacent property draining into open gulley in courtyard of No 7. Shared gulley outlet to parapet not wired over. Section of lead painted to at ground level, uPVC &amp; cast iron downpipe leading from ground level to basement. No observed blockages, no leaks at seams/junctions, adjacent stonework not stained/discoloured.</td>
<td>FRONT - It is important to clear and clean the downpipe and gulley outlet every 4-6 months; flush through the gulley opening and provide balloon grating over outlet.</td>
<td>Ensure that fixings remain secure and that lead does not sag or warp. Atmospheric pollution in this area can deteriorate lead at a higher rate, check seams and joints for leaks. Paint remaining sections of cast iron downpipe.</td>
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<td><img src="image2.jpg" alt="Image" /></td>
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<td>REAR ELEVATION – sections of cast iron downpipes and hopperheads collect surface water from rear roof slopes. Previous discolouration/staining from past leaks. Surface corrosion noted to joints, paintwork discoloured and flaking in places. Downpipe drains into eaves level gutter over small rear extension and then into an open gulley. No blockages evident within downpipe, gulley mouth within hopper not wired over.</td>
<td>REAR - Clear and clean the downpipe and gulley outlet every 4-6 months; flush through the gulley opening and provide balloon grating over outlet.</td>
<td>Check fixings and ensure joints and seams remain watertight. Replace sections that are too corroded. Paint all sections of iron downpipe.</td>
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<td><img src="image3.jpg" alt="Image" /></td>
<td><strong>7.2 Drainage</strong></td>
<td>Inspection hatch lifted to drainage chamber within rear courtyard area. Clay pipes were clear with no evidence of blockages or debris. Inspection chamber was in good condition with no cracking/decay to the concrete surrounds or framework support.</td>
<td>Inspect below ground drainage annually. Lift all accessible drainage hatches and flush through. Lift open gulley covers and clear any debris from within openings. Ensure that gulley adjacent to rear downpipe remains clear and clean.</td>
<td>It is likely that this is a combined (foul and surface) system. Blockages within the small diameter pipework can be harder to clear if left unchecked.</td>
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<td>A number of other open gullies were present to the rear courtyard, front basement and vaulted areas. These appeared to be running clear with no obvious odours or blockages to these areas. Cast iron gratings over original gullies showed surface corrosion.</td>
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<td>Ashlar block to main elevation, well cut, dressed and pointed. Rubble wall construction to basement levels and vaulted areas below pavement level.</td>
<td>Little sign of movement, a number of open joints to window openings to 1st &amp; 2nd floor level following the line of the mortar. Mouldings above openings and decorative cornice detail adjacent to parapet wall are severely weathered and worn, especially to high-level stonework. Decorative dentils are missing and badly corroded. Upper horizontal surfaces have been protected by lead detail/covering but effects of pollution and weathering have decayed extensive sections of stone.</td>
<td>Annual inspection of ashlar wall is advised, check for any further cracking or movement adjacent to existing open joints to window openings. Repoint all open joints and cracks in lime putty mortar, ensure all defective mortar is racked out before repointing.</td>
<td>Decayed and defective stone details to cornice level should be replaced. Check stability/integrity of existing stones. Due to high level of surface corrosion, wholesale replacement may be only option. Ensure that lead detailing above remains intact and well pointed into parapet wall adjacent. Listed building consent may be required.</td>
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<td>There is only a limited amount of surface staining to ashlar stone below cills and cornices, stone may have been cleaned in the past.</td>
<td>Surface decay to stone pilasters to main entrance porch, flat roof area is detailed in lead. Basement wall area is made from ashlar stone recently painted. Ground level is made up from a mixture of original flagstones (cracked &amp; uneven) and newer concrete slabs spanning over void of sub basement below. Slate detail set into ashlar wall to prevent water from draining directly onto external face of basement wall below. Original stone steps have been replaced with metal tread open stairs that lead to basement level flat entrance. Minor surface corrosion noted, especially to fixings into adjacent walls.</td>
<td>Assess condition of stones to mouldings above window openings. Replace decayed/worn stones where necessary. Ensure that lead detailing above remains intact and well pointed into parapet wall adjacent. Listed building consent may be required.</td>
<td>Ensure that slates at basement level remain well detailed into main wall. Replace cracked/damaged slates; fill gaps between with mastic sealant.</td>
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<td>Basement wall area is made from ashlar stone recently painted. Ground level is made up from a mixture of original flagstones (cracked &amp; uneven) and newer concrete slabs spanning over void of sub basement below. Slate detail set into ashlar wall to prevent water from draining directly onto external face of basement wall below. Original stone steps have been replaced with metal tread open stairs that lead to basement level flat entrance. Minor surface corrosion noted, especially to fixings into adjacent walls.</td>
<td>Ensure that fixings into walls are secure. Remove defective/loose stone and provide sleeve/expansion joints to allow for movement of fixings within wall. Repoint all fixings.</td>
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<td>8.1 Rear Elevation</td>
<td>Ashlar block construction to main elevations, rubble wall construction to basement areas. Walls are heavily stained to all areas due to sheltered conditions. Upper levels of wall have remains of dead creeper/vine. Evidence of movement to lintels to 1st floor level. Cracks have opened up along mortar lines to stairwell area also. Parapet wall is weathered and worn, no evidence of movement, past pointing repairs evident. Timber lintels noted above rear door extension minor surface decay noted, timber painted, end grain exposed to both walls. Exposed timber wall plate noted at high level below cornice detail to stairwell area. Visual inspection revealed that timber was not painted, though wood is likely to be hardwood, surface decay maybe present. No movement/deflection noted to either area. Stone cills in poor condition, areas of defective stone, missing with damaged sections. Staining to walls below where stone has been ‘washed’ by surface water. Similar condition of stone was noted to cornice. Upper surface of stone was not protected by lead sheeting. Grid level courtyard area remains in reasonable condition. Areas of moss/vegetation growing within mortar to flagstones. Flagstones remain well bedded and pointed, drain into open gulley, concrete channel. Wrought iron grill over basement area in fair condition, surface corrosion to fixings into walls, especially to lower metal plate fixed to wall.</td>
<td>Annual inspection of ashlar wall is advised, check for any further cracking or movement adjacent to existing open joints to window openings and stairwell area. Repoint all open joints and cracks in lime putty mortar; ensure all defective mortar is racked out before repointing. It is preferable that rear elevation is cleaned. Specialist advice should be sought and listed building consent may be required. Assess condition of stones to comice and parapet area. Repoint open joints and replace decayed/worn stones. Provide lead detail to upper stone surface of cornice. Ensure that lead is well detailed into parapet wall. Replace sections of damaged cills ensure that an adequate drip detail to lower surface is provided and stone is well pointed into window opening. Remove vegetation from flagstones. Ensure that mortar is sound, repoint defective areas. Ensure that drainage gulley/channels remain clear. Improve detail at grid level to door opening, provide weather bar/strip to restrict surface water entering from courtyard area. Remove surface corrosion, paint all areas. Ensure that fixings into walls are secure. Remove loose stone and provide expansion joints to allow for movement of fixings</td>
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<td>Joinery</td>
<td>9.1 Timber sash windows to both front and rear elevations. General condition of external joinery is poor. High levels of pollution and climatic variations make front elevation more vulnerable. Numerous areas of flaking and peeling paint with missing putties to individual panes. Surface timber decay noted to joints to glazing bars and at junctions with frames. Stone reveals and cills are painted, defective pointing and gaps noted at junction with timber frame and ashlar stone. Windows to rear basement courtyard area have recently been decorated and are in better condition. Dormer windows at roof level are in generally poor condition, peeling and flaking paint noted to cills and sashes. Water drains directly from lead flat roof onto joinery below. Gaps noted between frame and vertical tiles. Main panelled front door in reasonable condition. Door furniture and locks operating correctly. Minor split/cracks noted to panels within door. Decorative condition is fair. Rear garden door in reasonable condition, minor open joints to lower panels. Limited weathering detail to prevent surface water from entering at floor level.</td>
<td>Annually inspect condition of windows and frames. Pay particular attention to joints where water can penetrate and open up joints and decay timber. Ease and adjust all windows, inspect condition of cords, weights and pulleys. Ensure all sashes are operational. Replace worn/defective cords and pulleys. Carry out minor joinery repairs to glazing bars, sashes and frames. Replace missing putties where necessary. Repoint all gaps to stone window reveals, ensure watertight detail. Ideally paint should be removed from all window reveals and cill surfaces. Redecorate all joinery to front and rear elevations in next 12-18 months. Scaffold access equipment will be required, consider carrying out other essential repair to stonework etc at same time. Fill in minor cracks to panels within doors; ensure all joints are well protected and decorated. Ease and adjust door furniture. Provide weather bar/stop at floor level to rear door frame to restrict external surface water from entering into building from courtyard area.</td>
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<td>10.1</td>
<td>Basement &amp; vaulted areas</td>
<td>Rubble stone wall construction to vaulted cellar areas, sub-basement and converted basement flat. SUB BASEMENT – Sited below main footprint of house. Original flagstones to floor, evidence of staining to some area due to ponded water. Walls remain in good structural condition, no evidence of cracking, surface of walls are damp which is expected to these areas. Surface flaking of masonry paint; some pointing defects to areas of rubble walls. Stone steps lead up to vaulted cellar areas below pavement level. VAULTED CELLARS – Rubble wall construction. Iron ties/reinforcement ties have been inserted to sections of walls to both cellars. Badly corroded to all areas, integrity of ties not known or tested. Extensive cracking to spine and boundary walls. Extensive mould growth and penetrating damp to boundary and external walls. Flagstone floor uneven, areas are stained due to damp conditions. Stone steps lead up open courtyard area and converted basement flat. BASEMENT FLAT – Converted basement area, originally used as kitchen and servants quarters. Stone hearths and fireplaces overhauled and refurbished. External walls not drylined, no evidence of penetrating damp. Concrete floors remain in sound condition, floor coverings are dry. Minor staining to ceiling plaster in kitchen. Leak to waste pipe above has been repaired, unlikely to be continuing as plaster finish would show evidence of increased staining/damp penetration.</td>
<td>SUB BASEMENT - Annual inspection of this area. Check wall and ceiling areas for movement/cracking. Ensure that flagstone remain even and be aware of any deformation or cracking to grd level. Repoint defective mortar to rubble walls and ensure that drainage gulleys are kept clear. Ensure that areas remain ventilated. VAULTED CELLAR AREAS – Specialist advice should be sought regarding present level and extent of cracking to boundary and spine walls. It is understood that this cellar was not covered in recent ‘basement’ survey by B&amp;NES. Continual vibration and traffic movement adjacent could have damaging effects on integrity of rubble wall, especially as damp condition prevail in this area. Effectiveness of cast iron ties is not known/clear. All defective pointing should be hacked out and repointed; decayed stones must be replaced. Ensure that open gullies remain clear and clean. Ideally flagstones should be relaid/rebedded, ensure that they are laid to drain towards gullies/channels BASEMENT FLAT – Ensure that flat remains well ventilated and aired. Ensure that existing chimneys are open to provide sufficient ventilation. Replace defective ceiling plaster to kitchen, check to ensure that pipework above is sealed and correctly jointed. Redecorate all new plasterwork.</td>
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<td><img src="1" alt="Image" /> 11.1 Courtyard Areas</td>
<td>FRONT COURTYARD AREA - Rubble wall construction to retaining wall to vaulted cellar area. Mixture of new concrete slabs and original flagstones to basement floor area. Flagstones cracked/uneven, concrete slabs span over basement void below. New metal open tread staircase leads down to courtyard area. Wrought iron railing present at pavement level, set into stone plinth. Base of railings corroded, lead wells set into stone corroded also. Past cement repairs evident to plinth area. Sections of stone cracked, missing and damaged. Stone steps leading to main entrance in good condition, no evidence of cracking or deflection.</td>
<td>FRONT COURTYARD AREA. – Relay loose/cracked flagstones to basement area. Ensure they drain away from building. Renew corroded railings and place in lead wells within stone plinth proud of stone surface. Remove surface corrosion, redecorate railings. Renew sections of damaged/cracked stone plinth, it may be necessary to renew complete section. Ensure that retaining wall to vaulted cellar remains well pointed and inspect walls annually for movement and cracking.</td>
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<td>FRONT COUTRYARD AREA. – Ensure that this area is swept clear and clean every 2 –3 months, clear all debris for gulleys and check all gully openings for debris/blockages. Remove surface corrosion to grill/bars and redecorate metal surfaces. Ensure fixings secure. Ideally new fixings should be installed with expansion sleeves to allow for movement of metal. Repoint fixings within wall. Annually inspect condition of retaining and boundary walls. Check for movement/cracking and sections of bulging walls. Ensure that all drainage channels within walls are kept clear.</td>
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<td>REAR COURTYARD AREA – Rubble wall construction to retaining and boundary walls. No evidence of cracking/movement. Walls recently decorated. Retaining wall remains in reasonable condition, no deflection or bulging of wall, areas of damp to lower sections of wall due to penetrating grd water. Part of vaulted ceiling area remains intact, open section has be secured over with wrought iron grill. Surface corrosion to some sections especially fixings into walls and metal wall plate. Flaking/peeling paint to surfaces. New gulleys installed at basement grd level, floor surface is mix of original flagstones and screed concrete. Concrete in areas is cracked and uneven. Vegetation/moss growing within retaining wall, fed by ground water from adjacent terraced garden.</td>
<td>REAR COUTRYARD AREA – Ensure that this area is swept clear and clean every 2 –3 months, clear all debris for gulleys and check all gully openings for debris/blockages.</td>
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<td>Inspection of flagstones annually; ensure they remain well bedded and pointed. Repaired areas of cracked/defective concrete screed.</td>
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GLOSSARY OF TERMS USED IN THE REPORT

**Arrises** Term relating to the clean cut edges to newly carved and cut stone. Often referred to more decorative masonry

**Ashlar** Square cut stone laid in regular course

**Flashing** Lead or zinc junctions between vertical wall surfaces and tiles

**Flaunching** A cement mortar strip round the top of a chimney stack to throw off the rain

**Hydraulic Lime** Lime mortar that contains higher amount of silicates/sand which gives mortar more durability especially in exposed locations.

**Laid to Falls** A term used to describe the correct incline of a gutter or a flat roof that allows water to drain away

**Sand/cement fillet.** This is found at the junction of the roof and party wall to prevent water from entering into the internal roof void

**Soffit** Horizontal timber detail forming the underside of the eaves where guttering is often attached to

**Sulphation** Black staining common to limestone buildings caused by acid rain and airborne soot etc.

**Tingles** Made of lead or copper these are fixings used to hold in place loose or slipped slates

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**Maintain Our Heritage Project Co-ordinator:**

Timothy Cantell
Weymouth House
Beechen Cliff Road
Bath, BA2 4QS
Tel: 01225 482228
Fax: 0870 137 3805
Email: tcantell@maintainourheritage.co.uk
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